

The Canadian Pandemic Influenza Plan for the Health Sector



Pandemic
Influenza
Pandémie
d'influenza



2006

INFORMATION NOTICE

The *Canadian Pandemic Influenza Plan for the Health Sector* (the Plan) was developed through a collaborative consultative process including representatives of Federal, Provincial, Territorial, local and regional governments, experts in the respective fields and non-government stakeholders.

Development of the Plan was originally coordinated by Health Canada with direction from the Pandemic Influenza Committee, a Federal, Provincial and Territorial technical advisory committee. The 2006 edition was coordinated by the Public Health Agency of Canada. The Plan is provided for information purposes to support consistent and comprehensive planning for the health sector response to pandemic influenza across Canada by governments and other stakeholders within their respective roles and responsibilities.

DISCLAIMER

The views and recommendations expressed in the Plan and technical annexes were developed through a collaborative consultative process including representatives of Federal, Provincial, Territorial, local and regional governments, experts in the respective fields and non-government stakeholders.

Users should seek their own independent legal and technical advice on how they will put to their own use and purpose the views, and recommendations contained in the Plan.

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The **Canadian**
Pandemic Influenza Plan
for the **Health Sector**



2006

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Foreword and Acknowledgements

The *Canadian Pandemic Influenza Plan for the Health Sector* maps out how the health sector can prepare for and respond to pandemic influenza in Canada. It does so by outlining the actions that should be taken during each pandemic phase and clarifying the roles and responsibilities of those who would be involved in such a public health emergency – governments at all levels, public health officials and front-line health care workers. As a practical working tool, it also provides guidelines and checklists to assist various jurisdictions with their emergency planning.

Ongoing planning for the health sector response is expected to raise the overall level of preparedness to deal with pandemic influenza in Canada and to support a sustained state of readiness based on the latest knowledge. Ultimately it is expected that advanced planning in the health and other sectors will together minimize serious illness and overall deaths, in the event of an influenza pandemic, and also ease any social or economic disruption that might be caused by a massive outbreak of the disease. Canada has had a pandemic influenza plan since 1988, and it continues to evolve based on research, evidence and lessons learned.

The *Canadian Pandemic Influenza Plan for the Health Sector* is the product of extensive dialogue and collaboration within the *Pandemic Influenza Committee* (PIC). Created in 2001, PIC consists of 15 voting members, including representatives from all provinces and territories. Expertise within PIC includes Chief Medical Officers of Health, epidemiologists, virologists, communicable disease specialists, clinical, public health and laboratory specialists and an ethicist.

Committee members, in turn, have been greatly assisted through a process of consultation with a wider group of stakeholders, including the health non-government organization community, local governments, emergency planners and bioethicists.

As Co-Chairs of the Pandemic Influenza Committee, we have found it a continually enriching experience to watch the document evolve, and to see the sheer amount of time, dedication and commitment poured into the maintenance of the Plan. We would like to thank all of those whose contribution has helped to develop the plan and to keep it up to date.

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Preface



Influenza A viruses periodically cause worldwide epidemics, or pandemics, with high rates of illness and death. Advanced planning for a large scale and widespread health emergency is required to optimize health care delivery during a pandemic. Unlike other public welfare emergencies, an influenza pandemic will impact on multiple communities across Canada simultaneously. Each local jurisdiction must be prepared to respond in the context of uncertain availability of external resources and support. Therefore, contingency planning is required to mitigate the impact of an influenza pandemic through planning and preparation by the co-ordinated efforts of all orders of government in collaboration with their stakeholders.

The overall goal of pandemic influenza preparedness and response is first to minimize serious illness and overall deaths, and second to minimize societal disruption among Canadians as a result of an influenza pandemic.

The *Canadian Pandemic Influenza Plan for the Health Sector* (the Plan) consists of an introduction and a background section, followed by the preparedness, response and recovery sections, which are consistent with the general principals of emergency response. Each section aims to assist and facilitate appropriate planning for the health sector at all levels of government for the next influenza pandemic. The Plan and the annexed guidelines, checklists and other documents were developed to assist all jurisdictions with the main components of health sector planning, including surveillance, vaccine programs, use of antivirals, health services, public health measures and communications. The most effective public health intervention to mitigate the impact of a pandemic is through immunization with an effective vaccine against the novel virus, and, to a lesser extent, through the use of antiviral drugs. In addition, comprehensive planning requires that appropriate surveillance capacity is in place, and that the health sector, emergency services and communities as a whole are informed and equipped to deal with a pandemic.

The Plan is intended to be dynamic and iterative, and will be updated and revised regularly. Since the Plan was first published in 2004, planning has been advancing on multiple fronts. Other sectors have become engaged in developing plans that are envisioned to form a comprehensive set of “nested” plans aimed at not only pandemic influenza planning but also for other public health emergencies. This Plan has a health sector focus and therefore does not fully address emergency response activities and business continuity issues, which would be expected to play an important role in mitigating societal disruption. The Centre for Infectious Disease Prevention and Control (CIDPC), Public Health Agency of Canada (PHAC), coordinated the development of this edition of the Plan in collaboration with the Centre for Emergency Preparedness and Response (CEPR), PHAC, with direction from the Pandemic Influenza Committee (PIC).

For this edition, the Plan has been revised to reflect new developments in pandemic influenza preparedness and to ensure consistencies with best practices. The enhanced Plan includes a number of technical updates, revisions and additions. Two new annexes, Public Health Measures and Surveillance have been added and several others have been updated. For those annexes that have not been updated, a note has been added on the cover page explaining that the content of the annex may not reflect the latest information on antivirals or the latest WHO phase terminology.

This Plan has a national scope and is intended to provide planning guidance and a record of nationally agreed upon approaches to many of the components necessary for a comprehensive response. Operational details regarding implementation of the response have not been addressed in this plan as it would be more appropriate for that level of detail to be included in each jurisdiction’s plan.

Section One Introduction



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1.0 Goals and Objectives

The goals of influenza pandemic preparedness and response are:

First, to minimize serious illness and overall deaths, and second to minimize societal disruption among Canadians as a result of an influenza pandemic.

These goals will be realized only through the coordinated efforts of all levels of government in planning and preparation.

The objectives of the Canadian Pandemic Influenza Plan for the Health Sector are:

To assist and facilitate appropriate planning and response at all levels of government by

- developing, through a federal, provincial and territorial (F/P/T) collaborative process, a national Plan that is acceptable and applicable to stakeholders and that clearly identifies roles and responsibilities;
- developing a Plan that is sufficiently flexible to account for the unknown epidemiology of a pandemic and the needs of different stakeholders;
- recommending planning considerations for the appropriate prevention, care and treatment during a pandemic; and
- recommending planning considerations for appropriate communications, resource management and preventive measures to minimize societal disruption from a health sector perspective.

To provide a Plan that is reviewed on an annual basis to ensure the incorporation of new developments and to ensure consistencies with best practices.

To provide an evaluated Plan that is sufficiently clear and comprehensive to ensure operational viability.

2.0 Overview of the Plan

Pandemic contingency planning activities in Canada began in 1983. The first detailed draft of a plan, then referred to as the Canadian Contingency Plan for Pandemic Influenza, was completed in 1988; there have been several drafts since then. The latest plan, first published in February 2004, now referred to as the Canadian Pandemic Influenza Plan for the Health Sector (the Plan), targets a wide range of people in the health sector who will be involved in planning and responding to an influenza pandemic; these include health emergency responders, health planners, health care workers, public health laboratories, as well as those involved in the manufacture, registration and supply of pharmaceuticals. However, the primary audiences are the P/T Ministries of Health because the provision of health care and essential services is the jurisdiction of the provinces and territories.

Given that an influenza pandemic is the public health event that is the most likely to have a major national impact, a specific plan to address this national public health emergency is needed. The Canadian Pandemic Influenza Plan for the Health Sector is one of several national emergency response plans. The Plan is however focused on the health sector response and therefore is not

designed to address other important issues such as business continuity during a pandemic. As a national plan this document is intended to provide guidance and support planning at the P/T, regional, local and facility level. Each level of government and each health care institution should develop their own pandemic plans that use the overall approach in the Plan but contain more operational details relevant to the specific site or jurisdiction.

3.0 Structure of the Plan

The Plan consists of a Preface, the core sections and the annexes. The Introduction Section and the Background Section are followed by the Preparedness Section and the Response Section; a Recovery Section is being developed for a later edition of the Plan. The Introduction and the Background Sections provide the conceptual and historical basis for the Plan and highlight overarching principles, such as roles and responsibilities. The Preparedness and Response Sections and pending Recovery Section reflect the general principles of emergency response of the Plan. Under this framework, the types of preparedness and response activities needed for comprehensive pandemic planning can be summarized as follows:

- **Prevention** activities include planning actions to ensure that all existing or known or unavoidable risks are contained. In conjunction with infection control recommendations (e.g. hand hygiene, respiratory etiquette), immunization with vaccines is the primary means of prevention (e.g., pneumococcal vaccine in the Interpandemic Period and pandemic vaccine once it becomes available); it forms the basis of the pandemic response in Canada and many other countries. The annual vaccine infrastructure is the building block used to develop the pandemic vaccine response.
- **Preparedness** activities include preparing the actual plans, training and simulation exercises to pretest the plans, communications and other interfaces to inform the public and other stakeholders.
- **Mitigation/Response** activities are directed at controlling the pandemic and repressing direct outcomes (mortality and morbidity due to influenza) and indirect associated effects (social disruption). Implementation of these activities would involve a series of escalating and potentially varying (but harmonized) responses as the pandemic unfolds across the country. Implementation also involves documenting activities and outcomes to determine if a more extensive response is required or if adjustments to the planned response are necessary.
- **Recovery** activities may start at different times across the country as the pandemic waves move through the various jurisdictions. These activities involve the organization of post-event activities to ensure restoration of “normal” Interpandemic services and service levels. Dismantling alternative care sites, phasing out alternate care workers, and commencing new services that may be required to address the impacts are examples of these types of activities. Activities would continue until the declaration of the end of the pandemic in Canada and the Interpandemic status is restored.

The content of this comprehensive pandemic influenza plan for the health sector has been organized into components. These components which include; surveillance, vaccine programs, the use of antivirals, health services, public health measures and communications, are first identified in the Preparedness Section. In that section, each component is addressed in terms of current status as well as planning principles and assumptions. Checklists of potential planning activities are also included as an annex (Annex A, Planning Checklists).

The Preparedness Section addresses prevention and preparedness activities during the Interpandemic Period. This section is the result of work that began after the first national meeting on F/P/T and local planning, which was held in January 2000; it is based on the deliberations of a number of pandemic influenza working groups, as well as the input of other stakeholder groups and organizations. The purpose of this section is to provide information and guidelines that can be used in the development of plans for F/P/T and local management of an influenza pandemic.

The Response Section addresses high-level operational activities for an effective national health sector response, including essential F/P/T coordination. (See Annex L, for details on the National Emergency Response System.) The Recovery Section, which is anticipated for the next edition of the Plan, will provide guidance on the coordinated post-pandemic activities for the health and emergency response sectors.

The national working groups and subcommittees addressed specific issues in the Plan and developed the guidelines and reference documents annexed in the Plan. The original working groups included: Surveillance, Vaccines, Antiviral Drugs, Public Health Measures, Communications and Health Services, with the latter divided into Infection Control, Clinical Care, Non-traditional Sites and Workers, and Resource Management. Each annex was created to address specific issues related to the overall goals of pandemic planning: firstly to minimize serious illness and overall deaths and secondly to minimize societal disruption among Canadians. The annexes published with the 2004 edition of the Plan were written based on the data available and prevailing beliefs and approaches to pandemic planning at that time. The annexes have been or are in the process of being updated to reflect current thinking and advancements in science and planning activities, and some new annexes have also been added to this edition to make the Plan more comprehensive.

4.0 Roles and Responsibilities

A coordinated response to pandemic influenza requires collective infrastructures, response capacities and coordinated activities that will permit the F/P/T Ministers of Health and their representatives to anticipate problems, monitor for adverse outcomes and respond to minimize the impact of pandemic influenza within their jurisdictions.

The roles and responsibilities of the Pandemic Influenza Committee (PIC) and the F/P/T Ministers of Health were detailed in a Working Agreement between Deputy Ministers of Health in March, 2001. The Working Agreement is an iterative document that allows for roles and responsibility components to be adapted or added as they are developed. This agreement was drafted prior to the creation of PHAC in September 2004. Currently PHAC and Health Canada, which together now comprise the federal health portfolio, will cover the federal responsibilities.

The F/P/T roles and responsibilities, including joint responsibilities as outlined in the Working Agreement 2001, are captured in the current Plan.

In general, the roles and responsibilities of the respective jurisdictions are as follows:

- The federal government, through Public Safety and Emergency Preparedness Canada, is responsible for the nationwide coordination of the pandemic influenza response, including surveillance, international liaison and coordination of the vaccine response.
- Joint responsibilities of the F/P/T Ministers of Health include ensuring the distribution of plans to all organizations that may be involved in the pandemic response and liaison with these stakeholders on an ongoing basis. The Ministers of Health may also be involved in planning simulation exercises once plans (national, federal and P/T) are in place. Development of cost estimates and options for decision makers will also be a joint F/P/T responsibility.

- The P/T governments are responsible for mobilizing their contingency plans and resources. Health emergency response commences at the local level and moves up the line to P/T levels and then to the federal level of government.
- Local public health authorities are responsible for planning local responses to an influenza pandemic with direction from both the P/T and federal levels. This involves liaising with local stakeholders (e.g. emergency responders, hospitals, mortuary services) in advance of a pandemic to facilitate a coordinated response if pandemic influenza strikes a community. It is likely that the local public health authorities, through existing or enhanced surveillance, may be the first ones to detect influenza in their communities. It is essential that the lines of communication in communities and up the line to the P/T and federal levels are clear and established in advance of a pandemic.

4.1 The Pandemic Influenza Committee

The PIC is a F/P/T committee that first met by teleconference in March 2002. It is co-chaired by two public health experts who represent the federal and P/T governments. The PIC is supported by the CIDPC, PHAC. With the establishment of the Pan-Canadian Public Health Network, PIC now reports to the Communicable Disease Control Expert Group, the terms of reference for PIC are being updated.

The mandate of PIC includes providing advice, expertise, recommendations, liaison and other activities associated with the Interpandemic, Pandemic Alert, Pandemic and Post-Pandemic Periods to support the health and safety mandates of all levels of government. The PIC will also provide advice, assistance and expertise concerning the development, maintenance, testing and evaluation of the Canadian Pandemic Influenza Plan, and when requested to do so, any P/T contingency plan.

Section Two Background



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1.0 Epidemiology of Pandemic Influenza

Influenza A viruses periodically cause worldwide epidemics, or pandemics, with high rates of illness and death. A pandemic can occur at any time with the potential to cause serious illness, death, and extensive social and economic disruption throughout the world. Experts agree that future influenza pandemics are inevitable, but the timing and severity of the next pandemic cannot be predicted. Because there may be little warning, contingency planning is required to minimize the potentially devastating effects of an influenza pandemic.

In nature there are 16 different haemagglutinins and 9 different neuraminidases, which are two important surface glycoproteins of the influenza A virus. Influenza virus subtypes are named according to these “H” and “N” proteins. Although all 16 of the H types can infect birds, to date only H1, H2 and H3 have been associated with widespread human disease and H5, H7 and H9 have demonstrated the ability to cause human disease. It is important to recognize that as birds are the natural reservoir for these influenza viruses, occasionally people who have close contact with infected birds will become infected with novel viruses. Not all novel viruses however will evolve into pandemic viruses; nevertheless the pandemic potential of any new virus must be considered.

The following conditions are necessary for an influenza pandemic to occur:

- a new influenza A virus arising from a major genetic change, i.e. an antigenic shift;
- a virulent virus with the capacity to cause serious illness and death;
- a susceptible population with little or no immunity; and
- a virus that is transmitted efficiently from person to person.

Historic evidence suggests that pandemics have occurred three to four times per century. In the last century there were three influenza pandemics (“Spanish flu” during 1918-1919, “Asian flu” during 1957-1958, and “Hong Kong flu” during 1968-1969); these pandemics were separated by intervals of 11 to 44 years. The worst, during 1918-1919, killed an estimated 30,000 to 50,000 people in Canada and 20 to 50 million people worldwide. During each of the last three pandemics, the greatest increase in death rates occurred among persons less than 60 years of age; during 1918-1919, the greatest number of deaths occurred among those 20 to 40 years of age.

It is uncertain how the next human pandemic virus might arise. However pandemic viruses could arise through genetic mixing (reassortment) between human and avian influenza viruses and perhaps through cumulative mutations. The 1957 and 1968 pandemic viruses were reassortants of human and avian influenza virus genes. Pigs, which can be infected with both human and avian influenza viruses, may act as vehicles for reassortment events. In theory humans can also act as mixing vessels. Mounting evidence, including molecular sequencing, suggests that all 8 genes of the 1918 pandemic virus are avian in origin and the human pandemic potential was acquired through a series of mutations. Further studies are being carried out in order to gain a better understanding of the factors governing virulence and transmissibility of the 1918 pandemic influenza viruses.

Direct transmission of avian H5N1 influenza from chicken to humans was demonstrated during the 1997 Hong Kong “bird flu” incident. The spread of highly pathogenic avian influenza H5N1 in multiple countries in Asia since 2003 has been associated with sporadic human cases and a relatively high mortality rate. The H5N1 viruses identified in human cases have been wholly avian

in genetic make up. The majority of new influenza strains emerge in Southeast Asia where large human populations have close interactions with pigs and domestic fowl. The probability of a new strain emerging in North America is thought to be relatively low.

2.0 Key Planning Assumptions

An influenza pandemic is an inevitable event; however the timing and epidemiology of the next pandemic is unpredictable. In the development of this plan, several assumptions have been made in order to provide some estimates of potential impact and facilitate preparedness in Canada. **These assumptions should not be interpreted as predictions for the next pandemic, but instead a reflection of current opinion regarding a reasonable scenario to guide planning activities.**

Pandemic plans need to be flexible in order to be useful for a wide range of possible scenarios, recognizing that it is not feasible to completely plan for every possible pandemic scenario.

The key planning assumptions are listed below; planning principles and assumptions are also presented for each component of the Plan in the Preparedness Section. In addition several of the key assumptions have been repeated in Annex M, Public Health Measures, where the recommended actions are linked to these and other more specific assumptions. These assumptions were developed based on information from a review of past pandemics and published reviews of other international plans. The assumptions regarding absenteeism are based on an analysis recently completed by the Department of Finance Canada.

2.1 Origin and Timing

- The next pandemic will first emerge outside of Canada.

The majority of new influenza strains emerge in Asia where the close proximity of humans, poultry and domestic pigs in farming communities facilitates mingling and genetic exchange between human and avian influenza viruses.

- The next pandemic virus will be present in Canada within 3 months after it emerges in another part of the world, but it could be much sooner because of the volume and speed of global air travel.

This assumption regarding timing is based on the last two pandemics. In 1918, returning soldiers who had influenza and traveled by train carried the virus from Québec to Vancouver within a few weeks. Given the increase, different patterns and speed of modern travel, a new virus once arriving in Canada could spread quickly in multiple directions throughout the country.

- The pandemic virus may arrive in Canada at any time of year (i.e., potentially outside of the usual influenza season in Canada)
- The first peak of illness in Canada could occur within 2 to 4 months after the virus arrives in Canada. The first peak in mortality is expected to be approximately 1 month after the peak in illness.

Based on past pandemics, when the pandemic virus arrives close to the usual annual influenza season in temperate climates (November to April), the interval from the arrival of the virus to the height of the epidemic can be very short.

- A pandemic wave will sweep across Canada in 1-2 months affecting multiple locations simultaneously.

This is based on analysis of the spread of past pandemics including the 1918 pandemic.

- The influenza pandemic will occur in two or more waves. In any locality, the length of each wave of illness will be 6 to 8 weeks. The pandemic will last 12 to 18 months and more than one wave may occur within a 12 month period.

2.2 Epidemiology

- The incubation period, period of communicability and method of transmission for the novel strain will be consistent with other known human influenza strains, that is:
 - Incubation period: 1 to 3 days;
 - Period of communicability: 24 hours before to up to 5 days after onset of illness (usually up to 3 to 5 days in immunocompetent adults, up to 7 days in young children);
 - Method of transmission: large droplet and contact (direct and indirect);
 - Role of airborne transmission is unclear; and
 - Transmission by asymptomatic persons is possible but it is more efficient when symptoms, such as coughing, are present and viral shedding is high (i.e. early in symptomatic period).
- The novel virus will be transmitted efficiently from person to person resulting in large numbers of people being infected, since there will be no significant immunity to the new virus on a population basis.

Historical evidence suggests that in an entirely susceptible population the average number of secondary cases generated by a typical case of influenza is 1.4 to 1.8 people (this is also known as the “basic reproductive number, R_0 ”). Interventions such as immunization, antiviral use, infection control measures and public health measures can affect this number. The population will be less susceptible overall if the new virus has circulated previously. For example, the H2N2 virus which caused the 1957 pandemic circulated widely up until 1968, therefore the population born prior to 1968 is expected to have some residual immunity to this particular strain.

- The initial clinical presentation will be consistent with known human influenza strains.
- Sub-clinical infection will occur.

Based on data from past pandemics, the current U.K. plan assumption is that approximately 50% of the infected population may be asymptomatic.

- The groups that are at high risk for complications or poor outcomes due to annual influenza (as per the National Advisory Committee on Immunization influenza statement) will be at high risk during the pandemic.

2.3 Impact

- The impact of the pandemic in terms of severity, age distribution and extent of spread may be different 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 over the course of the pandemic, but only 15-35% of the population will become clinically ill (i.e., there will be a relatively high rate of asymptomatic infection).
- For planning purposes assume that the majority of cases will occur in the first wave.
 - If the overall clinical attack rate is 35%, assume that 25% of the population will be clinically ill in the first wave.
- For a pandemic of mild to moderate severity (i.e., consistent with the last 2 pandemics) and in the absence of any interventions (e.g., vaccine, antivirals), of those who are clinically ill:
 - up to 50% of will seek outpatient care;
 - 1% will be hospitalized and recover
 - 0.4% will be fatal cases (of fatal cases the majority will also have required hospitalization).
- For a severe pandemic (in terms of health impacts) and in the absence of any intervention, of those who are clinically ill, up to 10% may be hospitalized and 2% may die.
- Individuals who recover from illness caused by the pandemic strain will be immune to further infection by that strain.

2.4 Absenteeism

The following assumptions and explanation have been provided by the Department of Finance (federal), Economic Analysis and Forecasting Division, based on work completed as of September 2006.

- During an outbreak in a specific area, it would be appropriate for employers to plan for a total workplace absenteeism rate of between 20% and 25% during the peak two-week period with lower rates in the preceding and subsequent weeks.
- This contrasts with average total absenteeism in a normal winter of 8%. Peak absenteeism could be expected to vary at the local level and by industry. The health care industry could expect to experience peak absenteeism at the top of this range – the highest of all industries (see Table 1 below). Small work units in which employees engage in a high degree of social interaction could expect higher peak absenteeism than larger work units with less social interaction.
- The prudent planning assumptions are based on modeling conducted by the Department of Finance. They reflect normal absenteeism, peak illness and caregiving absenteeism and a prudent planning buffer to account for heterogeneous effects across work units, possible workplace-avoidance absenteeism and possible absenteeism stemming from public health measures such as school closures.
- Industry variations in normal absenteeism are based on historical data. Estimates of peak illness absenteeism are based on evidence from past pandemics and consistent with a cumulative attack rate of 35%. Estimates of caregiving absenteeism are based on the historical relationship between sick leave and family leave. Industry variations in peak illness absenteeism are estimated using the historical relationship between total economy and individual industry absenteeism. This relationship is explained by industry variations in social density (the degree to which employees engage in social interaction as part of their work) and in the availability of leave. Below-average morbidity peaks could be expected in relatively low-social-density industries like goods and transportation and warehousing, while above-average

peaks could be expected in many services industries, and, in particular, education, health care and social assistance.

- There is no evidence of significant workplace-avoidance absenteeism during any previous pandemic, or during SARS. Nevertheless, it might be prudent for those engaged in business continuity planning to consider the possibility that some workplace-avoidance absenteeism might occur. Possible peak workplace-avoidance absenteeism in individual industries is estimated using a framework in which employees balance the perceived relative risk of the workplace with the cost of an absence. The perceived relative risk of the workplace is determined by the overall morbidity rate and whether an employee or his or her immediate family has already contracted the disease. If workplace-avoidance absenteeism occurs, it could be highest in education services, health care and social assistance and public administration, reflecting a combination of high social density and leave availability in these industries.
- The prudent planning buffer also allows for the impact of possible public health measures such as school closings. All British Columbia public schools and kindergartens were closed for a 2-week period in October 2005 as a result of a teachers' strike. There is no evidence that this caused a reduction in hours worked in the rest of the British Columbia economy. Census data suggests that 3.6 per cent of the workforce would need to make alternative arrangements in the event of school closings. The British Columbia experience suggests that many in this group had access to alternative arrangements that did not require them to miss work. While the experience with the British Columbia teachers' strike suggests limited effects, pandemic-related school closings might require part of the affected workforce to be absent from work.

Table 1 Daily Peak All-Cause Absenteeism by Industry in a Single City – Prudent Planning Assumption (per cent)

	Normal (February)	Illness and Care of Sick	Prudence*	Total
All Industries	8.0	5.6	6.4	20.0
Goods	8.1	3.9	4.9	16.9
Agriculture	7.0	3.1	3.3	13.4
Forestry, Fishing, Mining, Oil and Gas	9.9	3.4	4.7	18.0
Utilities	8.5	4.3	5.6	18.4
Manufacturing	7.5	4.6	5.5	17.6
Services	8.0	6.0	6.9	20.9
Trade	7.0	6.1	6.3	19.4
Transportation and Warehousing	9.5	5.0	5.9	20.4
Finance, Insurance and Real Estate	7.2	6.3	6.6	20.1
Professional, Scientific and Technical Services	6.3	6.1	6.2	18.6
Educational Services	7.5	6.4	8.7	22.6
Health Care and Social Assistance	11.1	6.3	8.2	25.6
Information, Culture and Recreation	3.8	5.7	6.3	15.8
Accommodation and Food Services	6.4	6.3	6.5	19.2
Other Services	6.5	5.0	5.1	16.6
Public Administration	9.4	6.1	7.7	23.2

* includes possible workplace-avoidance absenteeism and additional prudence to reflect work-unit heterogeneity and possible public health measures such as school closings.

2.5 Response

- It is unlikely that an effective vaccine will be available at the start of pandemic influenza activity in Canada but it may be available for a second wave.
- Mass immunization campaigns will occur when sufficient quantities of the new vaccine are available; this will increase the demand for public health human resources.
- The use of antivirals to decrease the risk of transmission from the first cases infected with a novel virus and their contacts will be considered as a strategy to contain or slow the spread of novel viruses that have pandemic potential and that are identified in Canada. **The use of this strategy will be limited to cases identified early in the Pandemic Alert Period in Canada.** During the Pandemic Period, this strategy will change to the nationally agreed upon strategy for the pandemic period.
- Public health authorities will manage pandemic vaccine supply when a pandemic vaccine is available, as well as the supply and distribution of antiviral drugs which are contained within the National Antiviral Stockpile.
- The Pandemic Influenza Committee will provide technical expertise during the pandemic period in order to inform the national response and facilitate consistency in response activities across Canada.

3.0 Estimated Impact of an Influenza Pandemic on Canadians

The impact of the next influenza pandemic is difficult to predict; it depends on how virulent the virus is, how rapidly it spreads from population to population, and the effectiveness of prevention and response efforts. Estimates of health and economic impacts are important to guide public health policy decisions and to guiding pandemic planning in the health and emergency sectors.

During “normal” influenza epidemics that occur almost every winter in North America, an average of 10% to 25% of the population becomes ill resulting in an average of 4,000 deaths and 20,000 hospitalizations. During severe influenza A epidemics, 30% to 50% of the population may become ill resulting in 6,000 to 8,000 deaths and 30,000 to 40,000 hospitalizations. The highest rates of infection and clinical illness occur in children but serious complications and death occur mainly in the elderly.

During a pandemic, historic data shows that over 70% of a population may become infected with the novel virus and the age-specific morbidity and mortality may be quite different from the annual epidemics. During the 1918-1919 pandemic, young adults had the highest mortality rates, with nearly half of the influenza-related deaths occurring among persons 20 to 40 years of age. During the 1957-1958 and 1968-1969 pandemics in the United States, persons over 65 years of age accounted for 36% and 48% of influenza-related deaths respectively.

An estimate of the health and economic impacts of a pandemic in Canada was performed in 1999 using a model developed by Meltzer and colleagues, United States Centers for Disease Control and Prevention, Atlanta, Georgia, (available at <http://www.cdc.gov/ncidod/eid/vol5no5/meltzer.htm>). The assumptions in this model are based on American epidemiologic data on various mutually exclusive population health outcomes (death, hospitalization, outpatient treatment, and ill but with no formal care) for severe annual influenza A epidemics and data from the most recent pandemics (i.e., not the 1918-1919 pandemic). For planning purposes we consider the estimates from this model to reflect a “mild to moderate” scenario in terms of severity of illness. Recently, projections have been made based on a more “severe” scenario. In the severe

scenario it is estimated that 2% of clinical cases will die and 10% will require hospitalization for management of their illness. While these higher estimates, which are considered to be more consistent with the outcomes of the 1918-1919 pandemic have been used to describe potential impact of a severe pandemic, to date the emphasis has been on national planning for a pandemic of moderate severity.

The Meltzer model does not include the potential impact of antiviral drugs, public health measures, or an effective vaccine. These estimates, therefore, may over-estimate the potential impact in Canada; they are provided here for planning purposes only and to raise awareness regarding potential health impacts. It is also important to recognize that as the age distribution of the Canadian population changes over time the potential health impacts will also vary. If the age-specific mortality rates remain highest for the age groups on either end of the age spectrum with the elderly having a higher rate than young children (i.e., the typical annual skewed “U-shaped” mortality curve), then as the population ages the potential number of deaths when a pandemic strikes may be higher than projected in this document.

Based on the 1999 analysis using the Meltzer model, during a pandemic of “mild to moderate” severity an estimated 4.5 to 10.6 million Canadians would become clinically ill such that they would be unable to attend work or other activities for at least a half a day (Table 2). This proportion, which represents 15% to 35% of the population, does not include individuals who contract the virus and feel ill but continue their usual activities. In addition, it is estimated that between 2.1 and 5.0 million people would require outpatient care, between 34 thousand and 138 thousand people would be hospitalized and recover, and between 11 thousand and 58 thousand people would die in Canada during an influenza pandemic (Table 2). It is important to note that since these are discrete outcomes the number of people hospitalized during the pandemic will include the entire “hospitalized and recovered” group and those that died in hospital which is expected to be a large proportion of the fatal cases. Moreover, these outcomes would occur as a result of relatively short (6-8 week) pandemic waves, highlighting the intense impact of pandemic influenza compared to other illnesses. These numbers are estimates and do not take into account the differences in the health care systems, practice patterns and health care-seeking behaviour in Canada as compared to the United States or changes in the age-distribution within Canada since 1999; nonetheless, they provide a picture of the magnitude and potential impact of the next influenza pandemic.

Outcome (based on Canadian Population: 30,301,180)	Attack Rate 15%			Attack Rate 35%		
	Mean Number	5 th Percentile	95 th Percentile	Mean Number	5 th Percentile	95 th Percentile
Death*	17,768	10,544	24,954	41,459	24,603	58,227
Hospitalization with recovery*	46,639	34,042	59,166	108,824	79,431	138,053
Outpatient Care	2,086,327	2,027,496	2,145,282	4,868,097	4,730,825	5,005,657
Ill, no formal care	2,394,443	2,335,458	2,455,967	5,587,035	5,449,401	5,730,591
TOTAL	4,545,177	4,407,545	4,685,464	10,605,415	10,284,265	10,932,623

* Note: Those who die in hospital are not counted in the “hospitalization with recovery” outcome – therefore the number hospitalized during a pandemic will be all of the “hospitalization with recovery” group plus likely a large proportion of the fatal cases.

Canadian estimates of resource use for patients with these health outcomes and Canadian resource unit costs were applied to provide an estimate of Canadian costs based on this American model. The economic impacts of the health outcomes (direct and indirect) on the health care

system and on society were estimated to be between CAN\$ 10 to 24 billion in 1999. This estimate does not include other societal impacts such as those on trade and tourism.

4.0 Terminology

On April 8, 2005, the World Health Organization (WHO) released an updated version of its 1999 guidance on pandemic planning and preparedness. This new document, *WHO global influenza preparedness plan: The role of WHO and recommendations for national measures before and during pandemics*, (available online at: http://www.who.int/csr/resources/publications/influenza/WHO_CDS_CSR_GIP_2005_5.pdf) contains WHO and national activities organized using new pandemic phase terminology.

To facilitate consistency with the WHO phases and to tie in a descriptor of national levels of novel influenza subtype activity in Canada, the revised nomenclature for Canadian pandemic phases is as follows:

WHO Global Phase . Canadian Activity Level (example: 3.0)

The WHO Phase number reflects the international risk or activity level with respect to the new influenza virus subtype virus (i.e. Phases 1 to 6) and is determined by the WHO. The Canadian activity level indicator noted after the decimal point would likely be determined by the Pandemic Influenza Committee (PIC) and/or the Public Health Agency of Canada (PHAC) and would summarize the observed new influenza virus subtype activity in Canada. It is proposed that these levels be classified as follows:

- 0 – No activity observed in Canada,
- 1 – Single case(s) observed in Canada (i.e., no clusters), and
- 2 – Localized or widespread activity observed in Canada.

Localized and widespread activity have been combined in one “level” since the response activities associated with these two categories are not sufficiently different to warrant distinguishing between them.

For consistency with the WHO terminology, it was also agreed that the general categories of Interpandemic Period, Pandemic Alert Period, Pandemic Period and Post-Pandemic Period be adopted and used in public communications.

4.1 New Canadian Pandemic Phases and Examples

During the Interpandemic Period (Phases 1 to 2), new emphasis is placed on addressing human health risks posed by animal outbreaks. The Pandemic Alert Period (Phases 3 to 5) now addresses the situation of evolution or adaptation of a novel animal influenza virus with pandemic potential. It places greater emphasis on rapid intervention in an attempt to contain or delay the spread of a new influenza virus subtype in humans. Although it is uncertain if such “containment” measures would be effective or feasible, it is still useful to consider potential early interventions for planning purposes.

Note: The phase terminology used reflects the epidemiological situation and the key objectives of the pandemic response but does not necessarily reflect the level of activation of emergency operations within Canada.

4.1.1 Interpandemic Period

Phase	Definition	Example(s)	Corresponding former Canadian and Who Global Phases (1999)
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 and/or disease is considered to be low.	Highly pathogenic H7N3 detected in poultry outside of Canada	Canada: Phase 0, Level 0 Global: Phase 0, Level 0
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 and/or disease is considered to be low.	Highly pathogenic H7N3 detected in a poultry flock in Canada	Canada: Phase 0, Level 0 Global: Phase 0, Level 0
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	Canada: Phase 0, Level 0 Global: Phase 0, Level 0
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	Canada: Phase 0, Level 0 Global: Phase 0, Level 0

4.1.2 Pandemic Alert Period

Phase	Definition	Example(s)	Corresponding former Canadian and Who Global Phases (1999)
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.	Canada: Phase 0, Level 0 Global: Phase 0, Level 1 or Phase 0, Level 2 if more than one human case
3.1	Single human case(s) with a new subtype detected in Canada. The 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 “de novo” or in association with an avian outbreak in Canada.	Canada and Global: Phase 0, Level 1 or Phase 0, Level 2 if more than one human case

Phase	Definition	Example(s)	Corresponding former Canadian and Who Global Phases (1999)
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 with a novel virus are occurring in connection to an avian outbreak.	Canada: Phase 0, Level 0 Global: Phase 0, Level 3
4.1	Single human case(s) with the 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 novel virus known to be causing small clusters of human cases outside Canada.	Canada and Global: Phase 0, Level 3
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.	Canada and Global: Phase 0, Level 3
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 with a novel virus are occurring.	Canada: Phase 0, Level 0 Global: Phase 0, Level 3
5.1	Single human case(s) with the 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.	Canada and Global: Phase 0, Level 3
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 the 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.	Canada and Global: Phase 0, Level 3

4.1.3 Pandemic Period

Phase	Definition	Example(s)	Corresponding former Canadian and Who Global Phases (1999)
6.0	Outside Canada increased and sustained transmission in the general population has been observed. No cases have been detected in Canada.	Countries outside of Canada have reported sustained transmission of the new virus in their populations.	Canada: Phase 0, Level 0; Global: Phase 1
6.1	Single human case(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.	Canada and Global: Phase 1
6.2	Localized or widespread pandemic activity observed in the Canadian population.	Large numbers of clinical cases being rapidly identified in Canada with no history of travel to an affected area.	Canada and Global: Phase 1, 2 or 4

4.1.4 Pandemic Waves

The new Canadian phase terminology does not include Canadian phases that would denote the end of the first pandemic wave, the interval between waves or the onset of a second pandemic wave. It is expected the Canadian Phase will reflect the highest level of activity occurring in Canada (using the .0, .1 or .2 nomenclature) and that additional details regarding pandemic waves will accompany this communication. Regional and local influenza activity will be communicated as sporadic, localized or widespread; these terms are similar to current national surveillance (FluWatch) terminology.

4.1.5 Post-Pandemic Period

A recovery period (Phase 5 in the 1999 WHO document) would be expected to occur following Phase 6 (i.e. the Pandemic Period) after which there would be a return to the Interpandemic Period (e.g. Global Phase 1 or 2). Indicators for the return to the Interpandemic Period will be likely based on epidemiologic indicators (e.g. the return of annual fall–winter cycle of influenza activity) rather than on a “return to normal” of societal or economic indicators.

4.1.6 Concurrent Circulation of Two or More New Influenza Virus Subtypes

The WHO has indicated that, in the event of concurrent circulation of two or more new influenza virus subtypes globally, the declared phase will reflect the highest level of risk for a pandemic. The PIC has also decided to use this strategy. For example, if H5N1 is causing sporadic human illness in Asia but no cases have been detected in Canada, the Canadian Phase would be 3.0. Subsequently, if a domestic avian outbreak of H7N3 occurs in Canada at the same time, it will be stated that Canada is in Phase 3.0 due to the H5N1 virus but is also responding to the occurrence of an avian outbreak caused by H7N3. The Canadian Phase would always reflect the status in Canada with respect to the virus with the highest pandemic risk, regardless of whether that virus is present in or outside of Canada.

5.0 Legal Considerations

The legal considerations that arise in the context of pandemic preparedness and response are varied and complex. Given that pandemic influenza is a global concern, planning and preparation requires the coordinated efforts of all levels of government within Canada in addition to international cooperation. It is important to recognize, therefore, that international laws as well as federal and provincial/territorial legislation may be needed to effectively respond to an influenza pandemic.

At the international level, the International Health Regulations (IHRs) provide a legal framework under WHO to protect against and control the international spread of disease while avoiding unnecessary interference with international traffic and trade. The revised IHRs (available at: <http://www.who.int/csr/ihr/en/>) substantially update the 1969 IHRs that addressed the potential spread of only three diseases: yellow fever, plague and cholera. They also establish a more effective and transparent process to be followed by WHO and states for determining and responding to a public health emergency of international concern (PHEIC). Most importantly, it broadens the scope of international collaboration to include any existing, re-emerging or new disease that could represent a threat internationally. New provisions in the revised IHRs include obligations for:

1. States to notify WHO of all potential PHEICs;
2. States to develop core capacity for surveillance and response;
3. States to establish a national focal point as the contact point for WHO on all IHR matters (PHAC will be Canada's IHR focal point); and
4. The establishment of a new legal framework for WHO's global health security epidemic alert and response strategy.

In accordance with the IHRs, there are obligations at all levels of governments. In Canada, provinces and territories would use established protocols to report influenza infections of international concern to PHAC (national focal point) and then PHAC would report potential pandemic flu to WHO.

6.0 Ethics and Pandemic Planning

Public health ethics is a new area of inquiry that aims to identify the underlying values and principles that inform public health interventions. It has been noted that “public health ethics requires that public health improvement come through just and respectful means”.¹ In Canada, ethics has increasingly informed health policy.² Ethical analysis helps to identify in a logical and transparent way how to “do the right thing”. Clearly, this is not always easy, as there may be conflicting ethical principles as well as other factors, such as regulations, scientific evidence and comparable policies in other countries, which must be taken into account. In this section, some of the emerging public health ethics principles that have influenced the development of the Canadian Pandemic Influenza Plan (CPIP) for the Health Sector are identified.

Pandemic influenza involves the entire health system, so it is important to consider how clinical ethics and public health ethics intersect. Clinical ethics is focussed on the health and interests of an individual. In contrast, public health ethics is focussed on the health and interests of a population. In an effective health system, these interests are in a dynamic balance. Seminal

1 Kass NE. Public health ethics: from foundations and frameworks to justice and global public health. *J Law Med Ethics*. 2004 Summer;32(2):232-42, 190.

2 The Royal Commission on New Reproductive Technologies (1993), for example, made explicit use of an ethical framework in developing health policy recommendations.

values in public health ethics are justice and respect for the individual. This reflects the assumption that a population can be healthy only with the collective support of the many individuals within that population. This support arises from the recognition that it is in an individual's best interest to be part of a healthy population.

The importance given to individual and collective interests will shift according to the nature of the health risk being addressed. When a health risk primarily affects an individual, clinical ethics will predominate and a high value will be placed on individual interests. When a health risk affects a population, however, public health ethics will predominate and a high value will be placed on collective interests. For example, during an infectious disease outbreak the public's health is at risk, and thus collective interests will prevail and individual interests may be temporarily affected (such as limitation of travel). Given the foundational values of justice and respect for individuals, public health ethics helps to identify why, when and how to exercise collective interests for the public good.

The organizing principle of public health ethics is the goal of public health itself: to *protect and promote the public's health*. This organizing principle is reflected in the Plan's two goals: to minimize morbidity and mortality and to minimize societal disruption. The health protection principle is exemplified in the basic strategies identified in the CPIP: detection and surveillance, public health measures, early treatment with antiviral medications, emergency management, and vaccine development. The health promotion principle is addressed through a well-thought out, nationally coordinated communications strategy that informs the public of the risk from a pandemic, and identifies infection control practices that everyone should adopt.

The debates in public health ethics have not centred around the need to protect and promote the public's health, but rather on the means by which to do this. Specifically, one of the greatest debates in pandemic planning has been around the issue of resource allocation. For example, given that 30 million doses of a pandemic vaccine cannot be made available to everyone at the same time, who will get what by when? The ethical principle that has guided these discussions is distributive justice. Distributive justice implies the distribution of resources in a fair and equitable manner based on need. This principle underlies the recommendation that health care workers form a priority group for the vaccine. However, how the distribution is done is important. Discussions on resource allocation that address the hard realities of limited resources bring into focus a seminal ethical principle adopted by public health ethics: respect for the inherent dignity of all persons.³ This means that although some people may not be eligible for a vaccine initially, they need to be informed and cared for in a way that is respectful and maintains their dignity. This principle will need to inform the allocation of all scarce resources during a pandemic.

Another major debate in public health ethics, is what to do when the promotion of the public's health occurs at the price of individual freedom. Autonomy is a highly valued principle in bioethics yet this can be at odds with protecting the public's health. One principle that has been developed to address this is the principle of least restrictive means.⁴ This principle stipulates that personal autonomy should be infringed upon only to the extent necessary to ensure the public good. This is illustrated in certain provincial public health laws. For example, during SARS public health officers quarantined those who may have been exposed to the SARS virus. This is considered to be a justifiable, temporary limitation of personal autonomy in the interests of limiting the spread of a specific communicable disease.

Other principles in public health ethics helped to inform the Canadian Pandemic Influenza Plan: specifically the need to optimize the risk/benefit ratio of any interventions and to maintain

3 Beauchamp TL, Childress JF. 2004. Principles of Biomedical Ethics, 4th Ed. Oxford University Press, New York.

4 Upshur, RE. Principles for the justification of public health interventions. Can J Public Health. 2002;93(2):101-3.

transparency and public accountability in public health decision-making. Optimizing the benefit/risk ratio means that the benefit of any proposed intervention needs to be maximized and the risks minimized. Benefit is assessed largely by evidence of efficacy; risk by anticipating any untoward effects of an intervention. However other factors, such as costs, feasibility, legal requirements and Canadian values also need to be factored in. Conducting a careful risk benefit assessment helps public health professionals ensure excellence. This principle also means decisions may need to be revised in the light of new information on risks or benefits. For example, in the 2004 Plan priority groups were identified for both antiviral treatment and prophylaxis. Based on evidence made available since that time, the decision was made to expand our antiviral stockpile, adopt an early treatment for all who need it strategy and conduct a full review of the prophylaxis issue, including public consultations.

Finally, the principles of transparency and accountability have also informed this Plan. Public health decisions should be publicly justifiable, and as such should be open to public review. The need for transparency and accountability are reflected in the planning process and the public access to the plan itself.

In summary, the principles of public health ethics have informed both the goals of this Plan, and the manner in which those goals should be realized. These principles create a very high standard for public health interventions. A number of ethics-related initiatives are underway both within government and within the academic sector.⁵ These initiatives will advance the new field of public health ethics and inform future editions of the Plan.

Summary of the ethical principles informing the Canadian Pandemic Influenza Plan for the Health Sector (2006) :

1. Protect and promote the public's health
2. Ensure equity and distributive justice
3. Respect the inherent dignity of all persons
4. Use the least restrictive means
5. Optimize the risk/benefit ratio
6. Work with transparency and accountability

⁵ One example is the Ontario Health Plan for an Influenza Pandemic 2006 that identifies an ethical framework for decision-making, adapted from Gibson J et al. Ethics in a Pandemic Influenza Crisis. Framework for Decision Making. Joint Centre for Bioethics. University of Toronto (2005).

Section Three Preparedness



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1.0 Introduction

1.1 Background

The Preparedness Section of the Canadian Pandemic Influenza Plan for the Health Sector (the Plan) addresses prevention and preparedness activities expected to be undertaken predominantly during the Interpandemic Period. It is based on the deliberations of a number of pandemic influenza working groups as well as the input of other stakeholder groups and organizations.

The purpose of the Preparedness Section is to provide information and guidelines that can be used in the development of plans for federal, provincial and territorial (F/P/T) and local management of an influenza pandemic.

1.2 Populations Under Federal Jurisdiction

Across Canada, various federal departments and agencies provide a varied range of health services to a number of “populations.” These populations (e.g. First Nations reserves, large military bases, federal prisons) could potentially cause an unprecedented increase in demand for health services in local health regions during a pandemic. Advanced planning is required to ensure that all P/Ts and regions in close proximity to these populations, as well appropriate federal authorities, have agreed-upon roles and responsibilities in the event of a pandemic.

The current status, outstanding issues and next steps for coordinated planning for First Nations communities are addressed in Annex B. Annex B also puts forward the proposed roles and responsibilities of different players to ensure proper and equitable management of pandemic influenza in First Nations communities.

Discussions at the federal level have been initiated to ensure that the needs of other populations under federal jurisdiction are also addressed within the context of a coordinated pandemic response. These activities should be discussed at the P/T and local levels where many of the issues may have been already raised.

1.3 Emergency Management and Coordination

As a result of recent emergencies, which include the terrorist attacks of September 11, 2001, and severe acute respiratory syndrome (SARS), the Government of Canada has taken a critical look at the way major emergencies are being managed. Following consultation with P/T and regional stakeholders, the federal government has taken and is implementing a number of measures to improve preparedness and response.

One such measure was the consolidation of federal programs related to security and emergency preparedness into a new department, Public Safety and Emergency Preparedness Canada (PSEPC); another was the creation of the Public Health Agency of Canada (PHAC). An identified need for leadership and coordination of activities, while respecting P/T jurisdictions, was fundamental to these changes.

The changes are now resulting in emergency management systems being reviewed, updated or changed. For example, Health Canada (HC) and PHAC are revising their emergency management structure to incorporate the approach of the well-established Incident Management System and to bring it in line with the National Emergency Response System that is also being developed by PSEPC. One common objective of these changes is to ensure that Canada has a complementary framework for dealing with emergencies that transcend provincial or national boundaries, such as a pandemic influenza.

An influenza pandemic is a complex public health emergency and as such the respective Ministries of Health have the primary responsibility for planning. Current activities also include coordination with other sectors to support both the health response and to maintain societal function. For example, as of November 2005, the federal government now has a Deputy Ministers' Committee on Avian and Pandemic Influenza Planning, which will direct and provide oversight for the coordination of all Government of Canada activities related to planning and preparedness for avian and pandemic influenza. In terms of F/P/T activities, Emergency Management Organizations (EMOs) are now represented on the Pandemic Influenza Committee. The "EMO role" is considered to be three fold: 1) managing the normal range of non-health events, 2) coordinating the provision of social/societal support to community residents, and 3) providing support to the health sector as requested and as appropriate, the latter being primarily in the coordination of surge related logistics support. During the pandemic, emergency management organizations at all levels will be engaged in managing the non-health consequences, such as the continuity of operations of essential services impacted by absenteeism.

It is anticipated that the emergency management and coordination of a response to an influenza pandemic will be based on existing plans and structures for health emergencies at all levels of government, including the involvement of the F/P/T Emergency Health Services (EHS) and Emergency Social Services (ESS). The unique aspects of responding to an influenza pandemic need to be addressed as part of preparedness activities; this is so all stakeholders involved in the response are well versed in how a generic health emergency response structure might be modified for pandemic influenza. An Emergency Social Services Generic Infectious Disease Plan is currently under development. This plan will outline pandemic response roles for ESS and the Centre for Emergency Preparedness and Response (CEPR).

See Annex L for more information about the Canadian emergency preparedness and response system.

2.0 Components of Pandemic Preparedness

The components of the 2004 edition of the Plan included surveillance, vaccine programs, antivirals, health services, emergency services, public health measures and communications. In this edition of the Plan, the emergency services component has been removed; it is now addressed as part of the preparedness for overall emergency management and coordination.

Federal, provincial, territorial and local planners are encouraged to consider the psychosocial implications of pandemic influenza when developing their plans for preparedness and response activities. It is anticipated that a component focusing on psychosocial issues will be added to future versions of the Plan.

Each of the Plan components in this section is addressed in terms of current status (including outstanding issues), and planning principles and assumptions. A list of potential planning activities is also included.

2.1 Surveillance

Influenza surveillance is required to identify when, where, and which influenza viruses are circulating, the intensity and impact of influenza activity, and high-risk populations. It is also required to detect unusual events (e.g. new strains, unexpected outcomes, changes in distribution or severity). Both virologic and disease surveillance are necessary for identifying influenza virus variants and for determining their ability to spread and cause disease. Surveillance data will drive the pandemic response because it will be used to determine the pandemic phase and to track progression through the phases. FluWatch, Canada's national influenza surveillance program, includes surveillance activities that aim to meet the general objectives stated below.

Laboratory surveillance involves the isolation of influenza viruses for analysis of antigenic and genetic properties. This activity is essential for monitoring the antigenic drift and shift of influenza viruses circulating among humans. Because the signs and symptoms of influenza are similar to those caused by other respiratory pathogens, laboratory testing must be conducted to definitively diagnose influenza. Rapid identification of a novel influenza virus and timely tracking of virus activity throughout the duration of the pandemic is critical to the success of a pandemic response. Prompt identification of a novel strain increases the lead-time for the development of a vaccine and the implementation of prevention and control measures.

The collection of epidemiologic data on influenza-like illness (ILI) and influenza-related hospitalizations and deaths is essential for determining the extent and severity of influenza epidemics. Access to real-time data is particularly important during outbreaks or epidemics associated with a newly recognized influenza variant. Determination of epidemiological parameters and indicators (e.g. indicators of human-to-human transmission, incubation period, period of communicability) is critical to informing the public health response. During the pandemic, epidemiologic data will be used to inform those developing prevention and control strategies, for example those strategies that require the identification of high-risk groups.

Jurisdictions need to be prepared to rapidly implement or modify enhanced surveillance activities. For the purpose of informing public health risk assessment and response activities, a coordinated and rapid epidemiological investigation that includes the collection, collation and analysis of detailed epidemiological, laboratory and clinical data is required. Further, rapid sharing of data and efficient communication at all levels of government are critical for facilitating a coordinated response.

The objectives of influenza surveillance are to:

- Provide data on currently circulating strains and facilitate comparison with vaccine composition and vaccine recommendations.
- Describe the affected population thereby facilitating the identification of high-risk groups and comparisons with other populations or other influenza seasons.
- Detect unusual events including unusual or new strains, unusual outcomes and/or syndromes, or unusual distribution or severity of the disease in the population.
- Inform the pandemic response through the early detection and tracking of the emergence, spread and impact of novel influenza viruses in the population.

2.1.1 Current Status

The national FluWatch surveillance system incorporates data on a weekly basis, year-round. Data sources include ILI surveillance from a sentinel primary-care network, virologic data from the national network of laboratories, influenza activity levels reported from P/T jurisdictions, and real-time paediatric morbidity and mortality data from the Immunization Monitoring Program, ACTIVE (IMPACT) surveillance network. Data akin to that provided by IMPACT for the paediatric population are not currently available for the adult population, however pilot projects are underway.

At the federal level, regular environmental scanning for the detection of potentially significant ILI is conducted using official information sources for influenza surveillance (e.g. World Health Organization [WHO] and government influenza surveillance programs from other countries) and unconfirmed reports from early warning systems (e.g. ProMed and other media scanning software, such as the Global Public Health Intelligence Network).

On an ongoing basis, the newly created national expert Working Group for Vaccine Preventable and Respiratory Infections Surveillance (VPRIS-N) will be assessing surveillance systems and making recommendations for enhancements and improvements for the Interpandemic, Pandemic Alert and Pandemic Periods. Recommendations from this group are being refined on an ongoing basis; current recommendations are included in Annex N, Pandemic Influenza Surveillance Guidelines.

The need for timely surveillance for severe respiratory illness in travellers and the development of special study protocols that can be activated at the time of a pandemic has been recognized by the Pandemic Influenza Committee (PIC) and currently remains an outstanding issue.

The Canadian Public Health Laboratory Network has updated the laboratory guidelines for pandemic planning and preparedness (Annex C, Pandemic Influenza Laboratory Preparedness Plan). There is a need to enhance laboratory-based surveillance including laboratory-testing capacity and the standardization of testing protocols. Progress has been made with respect to increasing the capacity to detect novel influenza viruses in Canada. The National Microbiology Laboratory now has the ability to detect all novel influenza subtypes and the capacity to do antiviral resistance testing, and provincial laboratories are developing the capacity to perform polymerase chain reaction testing for novel subtypes.

Progress has also been made with respect to linkages and collaboration with animal health experts involved in influenza surveillance and control.

2.1.2 Planning Principles and Assumptions

During each phase of a pandemic, epidemiologic and virologic data needs will change. Surveillance objectives during each phase will aim to meet the evolving information needs that will occur during the pandemic. Accordingly, surveillance roles and responsibilities for all levels of government are outlined by phase in Annex N, Pandemic Influenza Surveillance Guidelines.

Because surveillance data will drive the pandemic response, it is important that physicians and other health care workers are educated and updated on an ongoing basis about the importance of ILI surveillance as well as their roles in the system. Surveillance systems must be established in advance of a pandemic because there will be little time to augment capacity at the time of a pandemic. At the time of a pandemic, surveillance and laboratory-testing capacity will be reduced (e.g. due to staff absenteeism and potential supply shortages) compared with pre-pandemic periods; only streamlined, resource-efficient systems will continue to function. Special study protocols if required (e.g. to determine epidemiology or to investigate reported adverse events following immunization) at the time of a pandemic must be developed and pretested during the pre-pandemic period, recognizing that refinements may be necessary at the time of a pandemic.

The intensity and methods of virologic surveillance will differ depending on the phase of the pandemic. Initially, efforts should be directed at detecting the arrival of the novel virus into previously unaffected areas and collecting epidemiologic data on infected persons. This data will be used to characterize virus activity and to better target prevention and control measures. In addition, the arrival of the novel virus in a particular area will guide the mobilization of resources that are needed to implement control measures. After the virus has spread throughout the country, a basic level of virologic surveillance should continue in order to detect any changes in the virus, including the development of resistance to antiviral drugs in different populations. Targeted studies may include serologic studies of immunity to the virus in different populations.

Studies of the etiologic agents that are responsible for secondary complications of influenza and their susceptibility to antimicrobial drugs will also be important, especially in times of short supply. In addition, surveillance data and targeted studies will be useful in assessing the impacts of the pandemic on the health care system as well as its social and economic impacts.

2.2 Vaccine Programs

Vaccination of susceptible individuals is the primary means to prevent disease and death from influenza during an epidemic or pandemic. The National Advisory Committee on Immunization (NACI) produces annual recommendations on the use of influenza vaccine in persons who are most at risk for influenza or those who could spread influenza to persons at greatest risk. These interpandemic recommendations are published annually in the Canada Communicable Disease Report. In the event of a pandemic, PIC, which includes representation from NACI, will provide recommendations to F/P/T immunization programs on the development, production and use of the pandemic vaccine, and priority groups for immunization. Efforts should be made to encourage all jurisdictions to adopt the national recommendations on priority groups at the time of a pandemic in order to facilitate equitable access and consistent messaging.

The objectives of the pandemic vaccine program are to:

- Provide a safe and effective vaccine program to all Canadians as quickly as possible.
- Allocate, distribute and administer vaccine as rapidly as possible to the appropriate groups of people.
- Monitor the safety and effectiveness of vaccination programs.

2.2.1 Current Status

The annual influenza vaccine available in Canada is a trivalent vaccine, which is composed of two influenza A subtypes and one influenza B subtype. The vaccine contains 15 micrograms of hemagglutinin antigen for each constituent strain. For adults and older children previously exposed to viruses similar to those present in the vaccine, a single dose is normally recommended. In children (under the age of 9 years) lacking such previous exposure, two doses are recommended.

Currently, Canada uses approximately 10 million doses of trivalent influenza vaccine a year (equivalent to 30 million monovalent doses of 15 micrograms), which are delivered mainly by publicly funded programs with established vaccine delivery infrastructures. Provinces and territories vary in their target populations for annual influenza programs; the majority provides vaccine to NACI-recommended high-risk groups. Some P/Ts have expanded their programs to

include populations not currently identified as high-risk groups (e.g. the Ontario “universal” program) and have experience in conducting large influenza vaccination campaigns.

Influenza vaccine is usually available in October of each year and is currently provided by three suppliers. Annual influenza immunizations are administered in a variety of settings across Canada, including physician offices, public health clinics at schools or other community settings, workplace clinics and other settings (e.g. pharmacies).

The Canadian approach to vaccine procurement and supply contingency planning includes the development of the domestic infrastructure, a standby supply of fertilized hens eggs and other essential vaccine production supplies, the phasing-in of new technologies and further security of supply through multiple suppliers. In 2005, the federal government committed CAN\$34 million to the development of prototype (“mock”) vaccines to facilitate testing and streamlining of the pandemic vaccine strategy.

Health Canada is the regulatory authority in Canada that is responsible for ensuring the safety, efficacy and quality of all drugs, including vaccines, marketed in Canada for human use. Vaccine regulation in Canada is subject to the provisions of the Food and Drugs Act and Regulations. New vaccines are authorized for marketing in Canada following the review of data that is submitted by the manufacturer to support the safety, efficacy (immunogenicity) and quality of the vaccine. The regulatory challenge for a pandemic influenza vaccine will be to have mechanisms in place that can be used to review and authorize a safe and efficacious vaccine for use in Canada, within the shortest time frame possible, and to verify, once that vaccine is in use, that it is effective. Health Canada has prepared a regulatory preparedness strategy, outlining how this authorization will be accomplished in the circumstances of a pandemic. This documentation is available on the internet at:

http://web.hc-sc.gc.ca/dhp-mps/brgtherap/reg-init/vac/pandemicvaccine_nov2005_e.html
http://web.hc-sc.gc.ca/dhp-mps/brgtherap/reg-init/vac/pandemicvaccine_nov2005_f.html

Although enough vaccine will be made to immunize all Canadians, it is anticipated that the new pandemic vaccine will become available in batches, necessitating prioritization within the population as the initial doses become available. The Vaccine Working Group has made recommendations with regard to the priority groups for immunization in the event of a pandemic (see Annex D, Recommendations for the Prioritized Use of Pandemic Vaccine). In addition, P/T and local jurisdictions have developed guidelines for planning a mass immunization campaign (e.g. *Mass Immunization Campaigns: A ‘How To’ Guide*, Capital Health Region of Alberta, April 2000, *Guideline to Planning a Mass Immunization Campaign*, Waterloo Region Community Health Department, Ontario, January 2001, and *Guide pour la réalisation d’une vaccination de masse – À l’usage des directions de santé publique*, Ministère de la Santé et des Services sociaux, Février 2006); these can be adapted for use during a pandemic. (Access these documents through the respective organizations). The Vaccine Working Group will also develop guidelines for monitoring of vaccine use during a pandemic and identify issues related to adverse events following immunization (AEFI) tracking and liability. In addition, this group with other experts will provide input into clinical trial protocols.

The Immunization and Respiratory Infections Division of the Centre for Infectious Disease Prevention and Control (CIDPC) maintains an AEFI surveillance system. Reports of adverse events associated with influenza vaccination are monitored through reports from P/T Ministries of Health (approximately 95%), with some being reported by health care professionals and manufacturers directly to Health Canada (approximately 5%). The reporting is based mainly on voluntary notifications by clinicians and public health nurses, although there is a legal reporting requirement in some P/Ts such as Saskatchewan, Ontario, Quebec and Nova Scotia. The network

of children's hospitals that participate in IMPACT provide data on hospitalizations of children with possible AEFIs.

Outstanding issues with respect to vaccine programs include the dose in micrograms required to achieve a protective response to a novel strain in a naive host, if one or two doses of vaccine will be required, and the timing of vaccine availability in conjunction with onset of pandemic activity in Canada. This information is unlikely to be available until the pandemic has begun. Continued international vaccine research efforts are a priority, including clinical studies to evaluate influenza vaccines that contain novel subtypes (e.g. H5N1 vaccines) in immunologically naive populations. Priorities also include the development and evaluation of new vaccine technologies (e.g. non-egg based production technologies, recombinant vaccines, adjuvant vaccines) to increase the capacity to produce an effective pandemic vaccine, reduce the lead time for vaccine production and increase the capacity to vaccinate larger populations.

Another outstanding issue is the equitable distribution of vaccine to P/Ts and the development of implementation plans. The implementation plans will need to take into account the vaccination of federal populations (i.e., First Nations, Royal Canadian Mounted Police, Canadian Forces and federal penitentiary inmates).

2.2.2 Planning Principles and Assumptions

The vaccines currently available in Canada are inactivated vaccines that are manufactured in fertilized hens' eggs. This production depends on egg availability, and it is characterized by stringent time requirements for the identification of vaccine candidate strains, the preparation of seed lots, testing and licensing, and manufacturing and distribution. Manufacturers typically require a minimum of 48 days from the availability of the seed strain to the production of the first lot of vaccine for testing.¹ Delays in the production of pandemic vaccine seed strains may occur as highlighted by the difficulties encountered in trying to produce a vaccine against the H5N1 virus that was involved during the 1997 Hong Kong outbreak. Consequently, vaccine may not be available when the first wave of the pandemic strikes Canada.

At the time of a pandemic, it is assumed that monovalent vaccines containing only the pandemic strain will be used. The dosage and schedule of the pandemic vaccine needed to induce immunity in different populations must be determined through clinical testing. Where possible, clinical testing with vaccines for novel virus subtypes should be performed during the Interpandemic Period and confirmatory trials for the specific pandemic vaccine should be carried out at the time of a pandemic.

It is assumed all persons who lack previous exposure to the pandemic virus subtype will likely require two doses of vaccine, but the dosage is unknown (e.g. two 15-microgram doses or higher). It may be possible to give in advance an initial immunization with a generic vaccine of the correct H type and then give a second dose with the specific antigen. If that is possible, domestic vaccine production and immunization could begin before Canada has the required specific strain. Strategies to enhance the immunogenicity of influenza vaccines and reduce the amount of antigen required (e.g. use of adjuvants, whole-cell vaccines, intradermal route of injection) require further research.

Most countries will probably view a pandemic as a national health emergency or a threat to national security, therefore embargos on vaccines must be anticipated by countries with capacity for influenza vaccine production. Canada has invested in a domestic supplier to offset this possibility.

¹ The figure of a minimum of 48 days for availability of first lot (through to availability of internal quality control tests) assumes delivery of seed virus on day 0 and receipt of the necessary reagent no later than 13 days after the seed strain has been provided.

When vaccines become available, initial supplies may not be sufficient to immunize the whole population and prioritization of vaccine administration will be necessary. The F/P/T governments will control the allocation and distribution of influenza vaccine during a pandemic and will implement specific recommendations with regard to priority groups for immunization. Priority groups, based on the overall pandemic preparedness goal of minimizing serious illness, overall deaths and societal disruption, have been proposed in Annex D, Recommendations for the Prioritized Use of Pandemic Vaccine. However these priority groups may change when more is known about the epidemiology of the pandemic. It is assumed that for a two-dose program, completion of the second dose should be carried out as soon as possible to effect immunity; administration of the second dose should not wait until after every priority group has received a first dose. This strategy will require extensive planning that involves tracking and recall mechanisms.

The aim during a pandemic is to vaccinate the whole Canadian population on a continuous prioritized basis as quickly as possible. The current domestic pandemic vaccine production capacity is 8 million 15 microgram (ug) doses per month as specified in the current contract with this supplier. The possibility of increasing this capacity is currently being explored. Knowledge regarding anticipated schedules (i.e., antigen per dose, number of doses, and interval between doses) to optimize immunity may be derived from prototype vaccine clinical trials before a pandemic. Further clinical trials may be needed at the time of the pandemic. Vaccine recommendations may not be finalized until pandemic activity has commenced. These recommendations will be distributed as national guidelines as soon as possible, to facilitate a consistent and equitable approach.

For vaccine program planning purposes, it is important to be prepared to immunize 100% of the population; however, the actual proportion of the population that will voluntarily seek vaccination will depend on public perception of the risk and the severity of the disease. Therefore, the demand, which will manifest as clinic attendance, will likely vary among jurisdictions and within each jurisdiction as the pandemic evolves. Previous experience with outbreak-related immunization clinics indicates that it would be prudent to prepare for an initial demand of 75% of the target population. It is recommended that planning activities also focus on delivering a two-dose program to ensure that the public health response is ready to deal with this possibility.

A plan needs to be in place to monitor vaccine safety and to ensure the timely communication of any potential adverse event following immunization (AEFI) during the pandemic. Information on potential AEFIs must still be communicated in a timely manner from local to P/T public health authorities and on to the Immunization and Respiratory Infections Division, CIDPC, PHAC. The CIDPC will provide information to the Biologics and Therapeutic Products Directorate, HC and other stakeholders. Specific targeted studies and epidemiological investigations may be required in addition to passive surveillance.

Clinical trial protocols should be developed in advance of a pandemic and updated as needed, based on available knowledge about influenza vaccines and changing technologies. Phase three clinical trials for vaccine efficacy may not be performed prior to the implementation of vaccine programs at the time of a pandemic. Estimation of vaccine effectiveness may need to be carried out by studying predetermined target populations during the pandemic. The PHAC will coordinate studies on vaccine effectiveness with P/Ts, researchers and the vaccine manufacturer.

During the Interpandemic Period, consideration should also be given to improving pneumococcal vaccination coverage levels in NACI-recommended “high-risk” groups and to optimizing vaccine coverage in children with the 7 valent conjugate vaccine. *Streptococcus pneumoniae* is a common cause of secondary bacterial pneumonia. The incidence and severity of secondary bacterial pneumonia during the pandemic may be reduced if there is a high level of immunity to the most common serotypes of *Streptococcus pneumoniae* in the high-risk groups.

2.3 Antivirals

Vaccines, when available, will be the primary public health intervention during a pandemic. However at the start of the pandemic, vaccines may not be available as soon as required and two doses of vaccine may be necessary to achieve an adequate immune response. Antivirals (anti-influenza drugs) are effective for both treatment and prophylaxis of annual influenza. These drugs were not available during past pandemics, but are expected to be effective against pandemic strains of the influenza virus. Antivirals will likely be the only virus-specific intervention during the initial pandemic response. Protection afforded by antivirals is virtually immediate and does not interfere with the response to inactivated influenza vaccines.

Two classes of antiviral drugs are currently available in Canada for the prevention and treatment of annual influenza infection: M2 ion channel inhibitors (cyclic amines) and neuraminidase inhibitors. M2 ion channel inhibitors interfere with the replication cycle of influenza A, but they are not effective against influenza B. Amantadine and rimantadine are examples of M2 ion channel inhibitors. Zanamivir and oseltamivir are examples of neuraminidase inhibitors. These drugs interfere with replication of both influenza A and B viruses and are well tolerated; they have been used effectively for the prophylaxis and treatment of influenza A and B infections. The latest data regarding these drugs and recommendations for their strategic use are provided in Annex E, Planning Recommendations for the use of Anti-influenza (Antiviral) Drugs in Canada during a Pandemic.

The objectives of the antivirals initiative are to:

- Recommend a strategy for the use of antivirals during a pandemic.
- Address issues around the security of supply of antivirals.
- Monitor drug resistance during the pandemic.
- Facilitate planning to ensure the distribution of antiviral drugs in the national stockpile according to the nationally agreed upon strategy.

2.3.1 Current Status

The neuraminidase inhibitor oseltamivir, previously approved in Canada for treatment purposes only, was approved for post-exposure prophylaxis in December 2003. Prior to December 2003, only amantadine was approved for use in Canada for both prophylaxis and treatment of influenza A infections. Rimantadine is not currently approved for use in Canada, and zanamivir is approved for treatment purposes only. At this time neuraminidase inhibitors are much more expensive than amantadine which is made by several generic drug manufacturers.

Antivirals are usually prescribed during the annual influenza season by individual physicians on a first-come, first-served basis. Early in the 2005-2006 influenza season higher than expected demand, possibly due to heightened public concern regarding the outbreak of avian influenza in Asia, resulted in the manufacturer of oseltamivir limiting public access to this drug. This move was intended to ensure that sufficient quantities of this previously relatively low usage drug would be available for the management of influenza outbreaks in institutions for the duration of the annual influenza season. While the supply of oseltamivir is expected to increase, this occurrence highlights the potential surges in demand that may occur both in the public and private sector as recognition and use of this drug increases.

The WHO has encouraged countries, where it is economically feasible, to start stockpiling antiviral drugs because not only national but global supplies of antivirals could be consumed rapidly at the start of a pandemic. Many developed countries now have antiviral stockpiles, at least 10 of which intend to stockpile enough neuraminidase inhibitors to treat 20-40% of their population.

In Canada, a National Antiviral Stockpile composed of 1.6 million treatment courses of oseltamivir was established in the fall of 2004 to ensure that all P/Ts would have access to antiviral drugs. The antivirals from this stockpile were distributed on a per capita basis to the P/Ts. Further work in this area yielded recommendations from the national Antivirals Working Group and the PIC to increase the size and diversify the composition of the national stockpile.

At a joint meeting of the Council of Chief Medical Officers of Health (CCMOH) and the Public Health Network in February 2006, recommendations for the size, composition and use of the National Antiviral Stockpile were formalized. In alignment with the overall goals and principles of the Canadian Pandemic Influenza Plan, it was recommended that the size of the National Antiviral Stockpile be increased to 55 million doses (5.5 M treatment courses) of neuraminidase inhibitors² in order to provide for early treatment of those with illness. It was agreed that the national stockpile should be used for early treatment with targeting of those with ILI who are deemed to be most at risk of serious morbidity and mortality. Furthermore, there was agreement that a national process should be developed, including broad consultation, to facilitate more informed decision making regarding the inclusion of antivirals for prophylaxis in the national stockpile.

It was also recommended at this meeting that the national stockpile be composed of approximately 10% zanamivir and sufficient oseltamivir solution (approximately 2 million doses) to treat young children and people who cannot swallow capsules. In addition, as part of a comprehensive containment strategy, it was agreed that a specified quantity of antiviral drugs should be designated for containment of spread of a novel virus during the Pandemic Alert Period in the event that this becomes necessary in Canada. The use of antivirals as part of the containment measures during the Pandemic Alert Period is briefly addressed in Annex M, Public Health Measures. Development of a comprehensive containment strategy requires further planning and discussion at the national level.

In addition to the National Antiviral Stockpile, the National Emergency Stockpiling System (NESS) also contains oseltamivir which could be used during domestic avian influenza outbreaks or for P/T support during the Pandemic Alert or Pandemic Period.

Mechanisms for the delivery, administration and monitoring of the use of antivirals still needs to be addressed with most of the implementation details requiring P/T and local level planning. Other outstanding issues include the development of protocols for monitoring drug resistance during the pandemic and for determining the appropriate treatment dose and duration for the novel virus.

Health Canada currently receives adverse drug reaction reports from health care providers. Although further discussions are required on the unique needs of monitoring the extensive use of antivirals during a pandemic, it is expected that the current reporting system will be used.

² This recommendation was endorsed by the F/P/T Ministers of Health in May 2006 when the Ministers agreed to seek authority as necessary to increase the joint National Antiviral Stockpile from 16 million to 55 million doses.

2.3.2 Planning Principles and Assumptions

An effective intervention with antivirals will require:

- a secure supply (i.e. stockpile(s) of effective drugs);
- a well-planned distribution and monitoring system under the direction of F/P/T governments in collaboration with suppliers;
- a strategy enabling early access to treatment;
- availability of rapid diagnostic tests for influenza;
- enhanced surveillance for the detection of the virus, resistance of the virus to antivirals and drug-associated adverse events;
- clinical guidelines for the appropriate use of antivirals;
- study protocols to further assess the effectiveness of antivirals during a pandemic; and
- effective communication and education materials on antivirals for health care workers and the public.

The Antivirals Working Group is currently addressing many of these issues.

During a pandemic, antiviral strategies should use all the types of effective anti-influenza drugs that are available to Canadians, and should be adaptable to changing disease epidemiology and vaccine availability. If the novel virus is found to be susceptible to amantadine, which is not currently part of the National Antiviral Stockpile, it is recommended that amantadine be used for prophylaxis (not treatment) only. Oseltamivir could be used for both treatment of cases and prophylaxis. The efficacy of oseltamivir and amantadine are approximately equal for the treatment of cases infected with sensitive strains; however, amantadine is recommended exclusively for prophylaxis to minimize the development of amantadine resistance (which would render the drug ineffective) during the pandemic. The timing of the use of antivirals during a pandemic should be guided by local surveillance data.

Planning by the health sector should focus on implementation of an early treatment strategy using neuraminidase inhibitors (mostly oseltamivir), as this has been agreed upon as the use for the drugs in the current National Antiviral Stockpile. In determining this approach consideration was given to the effectiveness, efficiency and ethical implications of the strategy and the role of the antiviral strategy as one part of the comprehensive response.

The role and impact of antivirals in preventing transmission and slowing down the spread of a novel influenza virus during the Pandemic Alert Period is unknown. Although this potential role is now under discussion as part of the containment measures for the Pandemic Alert Period, it is currently not recommended for the Pandemic Period.

Depending on the epidemiology of the pandemic, the recommended treatment course (e.g., if changes need to be made to duration or dosage), and the antiviral supplies available at the time, it may be necessary to focus on treating those at highest risk for complications. This decision will be made based on the information available at the time. For planning purposes, those implementing the strategy need to determine in advance:

- how patients would be identified and managed in order to receive the antivirals in a timely manner (i.e., ideally within 48 hours of symptom onset),
- any screening procedures for identification of high-risk or pregnant/nursing women,
- how the different drugs in the stockpile would be dispensed (e.g., oseltamivir suspension, zanamivir) and supplies monitored.

2.4 Health Services Emergency Planning

During the pandemic there will be a marked increase in demand for people (health care providers and others) to care for the sick and for appropriate locations and equipment to facilitate the provision of health care. Communities and health care organizations will need to have plans in place that will address what will be done when the health care system is overwhelmed and care must be provided by persons, both health care workers and volunteers, doing work that is not normally part of their daily activities and possibly in settings not usually used for health care.

The objectives of health services emergency planning are to:

- Identify issues that will require multi-level collaborative planning during the Interpandemic Period.
- Facilitate awareness of the potential impact of a pandemic on the health care system.
- Prepare resources and guidelines that may be adapted during a pandemic.

2.4.1 Current Status

Outbreaks of influenza occur annually in Canada. The morbidity and mortality during any given influenza season depends mainly on the circulating strain(s) of influenza virus and the susceptibility of the population. Those normally at high risk of influenza complications are the elderly, persons with chronic cardiac or respiratory conditions, and the immunocompromised.

The spectrum of illness seen with influenza is extremely broad and ranges from asymptomatic infection to death, which is frequently due to secondary bacterial pneumonia or exacerbation of an underlying chronic condition. Many institutions in Canada are presently running at maximal or near maximal bed capacity. Even currently, during peak annual influenza activity, it is difficult for many facilities to manage the increased demand for beds and emergency room care. A report by the Manitoba Centre for Health Policy and Evaluation showed that the total number of hospital admissions and ambulatory visits provided by the Winnipeg health care system increased only slightly (5% to 7%) during severe influenza seasons; however, the number of patients presenting with ILI increased substantially (approximately 70% for ILI related admissions and 35% to 40% for ILI related physician visits). (This report is available at: http://www.umanitoba.ca/centres/mchp/reports/reports_97-00/seasonal.htm). The report suggests that there is an overall maximum level of service that can be provided; it increases somewhat in response to need, but the patient mix that requires care also affects it.

The scarcity of health resources will be exacerbated during a pandemic and could exceed the capacity of the current health care setting to cope; therefore, it is imperative that planning occur at the individual facility level in addition to regional and P/T levels. “FluSurge” is a spreadsheet-based model that provides the user with estimates of the surge in demand for hospital-based services during an influenza pandemic. The program estimates the number of hospitalizations and deaths attributable to an influenza pandemic (the length and virulence of the pandemic are determined by the user) and compares the number of persons hospitalized, the number of persons requiring care in intensive care units, and the number of persons requiring ventilator support during a pandemic, with existing hospital capacity. This program is a useful tool for local and regional level planners, and it is available free of charge on the United States Centers for Disease Control and Prevention Web site at: <http://www.cdc.gov/flu/flusurge.htm>. This program might also be of assistance when examining the potential increased demand for health care related supplies and equipment. Given that many facilities operate on a “just in time”

delivery system for medical supplies, strategies for dealing with a sudden increase in demand should be developed in advance of the pandemic.

Various PIC working groups have developed health services guidelines to assist acute- and chronic-care institutions, health care planners, clinicians and other stakeholders with planning for and coping with large numbers of influenza cases, some of whom may have severe disease or life-threatening complications. These guidelines are presented as annexes for ease of use. They can be broadly classified into the following categories, which correspond to the main responsibilities of each of the working groups: clinical care, infection control (including physical management) and occupational health for traditional and non-traditional settings, resource management and nontraditional workers. The annexes provide options, worksheets and guidelines to facilitate planning for a consistent and comprehensive response within the health sector.

The working groups will also be looking at training and education modules for health care workers, volunteers and the public, and aftercare and recovery planning issues.

2.4.2 Planning Principles and Assumptions

Because of the broad scope of planning activities, this section has been subdivided according to the subgroups that have worked on them. Documents or tools in the annexes will be referred to where relevant.

i) Infection prevention and control, and occupational health

The incubation period for influenza usually ranges from 1 to 3 days. Person-to-person transmission of influenza virus occurs through droplets from the respiratory tract that are spread by direct contact, through coughing or sneezing, or by hands (or other surfaces) contaminated with respiratory secretions. The importance of the airborne route in transmission is unknown. Influenza is highly contagious; it can spread quickly in settings where large groups of people (e.g. institutionalized populations) are gathered together.

The period of communicability for influenza is during the 24 hours before the onset of symptoms and during the most symptomatic period, usually 3 to 5 days from clinical onset in adults and up to 7 days in young children. Although viral shedding occurs in the 24 hours prior to symptom onset, transmission of the virus to another person is much more efficient once symptoms are present. In adults, the amount of viral particles shed (e.g. while sneezing or coughing) is related to the severity of illness and temperature elevation. For those receiving antiviral therapy, the duration of viral shedding is likely to be shorter.

Survival of the influenza virus outside the body varies with temperature and humidity. It generally survives 24 to 48 hours on hard, non-porous surfaces; 8 to 12 hours on cloth, paper and tissue; and 5 minutes on hands. Survival of the virus is enhanced under conditions of low humidity and in cold temperatures.

During the pandemic, it will be imperative to keep health care workers as healthy as possible. Occupational health issues that need to be considered include vaccination of health care workers, use of personal protective equipment, criteria for work exclusion and/or fitness to work, and work reassignments (see Annex F, Infection Control and Occupational Health Guidelines During Pandemic Influenza in Traditional and Non-Traditional Health Care Settings).

See Annex F for institutional infection control guidelines for traditional health care settings, including acute and long-term care institutions, ambulatory and community settings. The topics addressed include immunization, hand hygiene, use of personal protective equipment (e.g. masks,

gloves, gowns), patient isolation and accommodation, restriction of visitors, staff cohorting, environmental cleaning and education for staff, patients and visitors. The same topics are addressed for non-traditional settings (e.g. self-care, triage, pandemic hospitals) as well. Also see Annex J, Guidelines for Non-Traditional Sites and Workers.

The community section of Annex F contains infection control and occupational health guidance for the general public, health care workers providing services in the community, as well as for office-based medical and non-medical health care providers (e.g. public health clinics, physician offices, dental offices, physiotherapy clinics, alternative health care providers). The topics addressed include hand hygiene, the use of personal protective equipment (e.g. masks, gloves) and cohorting of persons with ILI. Infection control recommendations for the prevention of human infections during avian influenza outbreaks are available on the PHAC website.

ii) Clinical management of influenza

The last two influenza pandemics occurred during 1957-1958 and during 1968-1969. Therefore, the majority of currently practicing clinicians would have little or no experience with pandemic influenza disease and may not be aware of its potential variant presentations. The clinical guidelines in Annex G provide recommendations on the triage of pediatric and adult patients and recommendations on the management of patients in long-term care facilities. The Clinical Management of Influenza forms in Annex G are designed to help health care staff with case management. One form has sections on investigations that should be considered, treatment recommendations, as well as information about the selection of patients (children and adults) for hospital admission and for admission to intensive care. Standardized admission and primary care forms, with a triage component, will help to ensure consistency and minimize paper work.

During a pandemic, it will be essential to inform both the public and health professionals about the symptoms and treatment of influenza, as well as when to seek advice (see Annex G, Health Services: Clinical Care Guidelines and Tools, and Annex M, Public Health Measures). The fact sheets on the clinical features of influenza and secondary complications are designed to assist health care providers with diagnosis and the general public with self-treatment (see Annex G). These fact sheets include information pertaining to children, adults and the elderly. Any educational materials will require advance preparation in addition to a plan for efficient and timely distribution.

iii) Resource management

Although the impact of a pandemic is unpredictable, it is advisable for planning purposes to expect a major disruption in critical community services. The response of the health care system to this situation will be crucial. Regional, local and institutional planners will need to assess their health-resource utilization and the capacity of their health systems to cope during severe influenza epidemics, and to compare this information with the estimated capacity that will be needed to respond to a pandemic in their catchment areas. The FluAid software (available at: <http://www2.cdc.gov/od/fluaid/default.htm>), which is an American model for estimating the health impact of a pandemic, may be considered for resource planning purposes. However, with the American model, health outcome is based on health care-seeking behaviour or the treatment received. It is expected that the treatment for a person in Canada who is similarly ill with flu may be quite different because of the differences in the health care systems, practice patterns and health care-seeking behavior. The model further assumes that health care is available for all persons seeking care, which is consistent with the American demand-driven health economy.

Although in the majority of cases, influenza is an acute, self-limiting upper-respiratory infection, complications do occur. The overall attack rate is relatively high for influenza epidemics and

pandemics, and the impact is usually seen over the course of a few weeks in any one location. Consequently, even a low frequency of complications result in marked increases in rates of hospitalizations. It is important to consider that, although the waves of the pandemic tend to last for 6 to 8 weeks in any locality, the demand on the health care system will not be at a constant rate during this period because the number of new cases seeking health services is likely to increase, peak and then decline. The next pandemic wave may closely follow the first wave and therefore leave little time for recovery. Resource needs will need to be reassessed continuously during this potentially overwhelming situation. It will be a challenge for acute care facilities to manage high ward census, high intensive-care unit census and high emergency department volumes in the face of the reduced availability of health care workers and the limited supply of respiratory support equipment (see Annex H, Resource Management Guidelines for Health Care Facilities). Advance consideration should be given to the management of adult and pediatric patients with respiratory distress when oximeters, ventilators and other respiratory-support equipment must be rationed.

Each facility needs to evaluate its human resources. Because health care and hospital workers include a great number of individuals in many different occupations, a list of health care workers has been developed to assist with planning (see Annex H). Emergency reallocation of staff and the maintenance of staffing levels will be essential. Health care worker training and continuing education to encourage workers to maintain their skills, incentives to maintain training, and ongoing communication are all important; these items should be planned during the pre-pandemic period. During the pandemic, needs for child care, emotional support and grief counseling should be addressed to help maintain adequate staffing levels.

Elective medical and surgical admissions will need to be prioritized, and possibly some admissions will be cancelled to meet the increased health care demands of influenza. See Annex H, Resource Management Guidelines for Health Care Facilities, for a checklist of issues that acute-care facilities should consider during this prioritization process. Each institution will also need to evaluate their bed and ventilator capacity. Annex H also contains a worksheet to help facilities determine their potential surge capacity.

Pandemic influenza historically has been associated with excess mortality. It will be essential for jurisdictions to include a corpse management plan as part of their pandemic plan. See Annex I for guidelines on the management of mass fatalities. Items addressed in this annex include morgue capacity, corpse storage, transportation, management, burial, cremation and grief counseling.

All levels of government and health service institutions need to plan and put into place strategies to meet the greatly increased demand for medical supplies and services along with staff shortages that are anticipated (See planning assumptions regarding absenteeism in Background Section).

See Annex H, Resource Management Guidelines for Health Care Facilities, for recommendations on how to manage scarce resources during an influenza pandemic.

iv) Non-traditional workers: health care workers and volunteers

Communities and health care organizations need to have strategies in place that will address what will be done when health care facilities are overwhelmed and medical care must be provided in non-traditional settings. Alternate treatment centres and outpatient clinics may need to be set up to provide care. See Annex J for guidelines on the provision of care in non-traditional settings. Items addressed in this annex include administrative options for non-traditional hospitals, potential resources and sites, critical characteristics, support services needed, type of work done at sites and liability protection. Guidelines in Annex J also address potential sources of additional labour during a pandemic, volunteer recruitment and screening, liability and personal insurance of workers, temporary licensing of workers, roles and responsibilities, and training programs.

2.5 Public Health Measures

Certain decisions will have to be made at each level of government as novel virus and pandemic alerts occur. Local public health officials will be asked about measures that can be taken by the public and within a community to prevent, control or mitigate pandemic influenza in their jurisdictions. These decisions will range from population-based recommendations (e.g. canceling public gatherings, closing schools) to individual measures (e.g. if members of the public should wear masks). For the most part, the effectiveness of these types of measures for the control of disease within a population has not been systematically evaluated. In addition, the potential impact of these measures will vary depending on the level of pandemic activity in the particular community and the availability of other interventions, such as vaccines and antivirals. The purpose and effectiveness of these measures may also be different in isolated communities compared with large urban centres.

The implications of these potential measures, which range from local school closures to quarantine recommendations for ports of entry into Canada, must be recognized by all potential stakeholders and discussed during the Interpandemic Period.

The objectives of public health measures planning are to:

- Make recommendations regarding public health measures (e.g. quarantine, cancellation of public gatherings, school closures).
- Foster the development of a common approach in Canada and also, if possible, between other countries and Canada, especially on issues for which there is a lack of scientific evidence to guide decision making.
- Encourage planning at all levels of government to raise awareness about the potential impact of these measures so that the necessary partnerships and consultations with external stakeholders start during the Interpandemic Period and continue through all pandemic phases.

2.5.1 Current Status

Prior to the outbreaks of avian H5N1 influenza in Asia starting in 2003, pandemic planners did not pay much attention to the concept of a prolonged “pandemic alert” period. In March 2004, WHO held an international consultation on public health measures that could be implemented during each pandemic phase. At this meeting, the concept of pandemic prevention by containing outbreaks that occur during the Pandemic Alert Period was discussed extensively for the first time. There was agreement that containment of a novel virus, which is not transmitted as efficiently from person to person as a “routine” seasonal influenza, should be attempted using aggressive public health measures. The role of antiviral drugs, contact tracing, quarantine and exit screening were highlighted as the keys to potential containment.

The Public Health Measures Working Group had already considered these interventions. However, following the international consensus that containment should be attempted during the Pandemic Alert Period, the need for clear direction on implementing these types of measures in Canada was recognized. Consequently, the working group developed an annex on public health measures for this edition of the Plan that includes recommendations on public health management of cases and contacts, community-based control strategies, and travel and border issues (see Annex M, Public Health Measures).

2.5.2 Planning Principles and Assumptions

The recommendations of the Public Health Measures Working Group are aimed at facilitating a consistent and optimal response to public health communicable disease control issues during a pandemic. Because there is a lack of scientific data on the effectiveness of these types of disease control measures, especially in conjunction with other influenza control measures, it is unlikely that the benefits of these measures will be quantifiable. Therefore, in the absence of any conclusive data, the expert opinions expressed in Annex M, Public Health Measures will assist jurisdictions with the consistent implementation of timely measures that are in line with the objectives of each pandemic period, i.e. preparedness during the Interpandemic Period, containment during the Pandemic Alert Period and mitigation during the Pandemic Period.

The P/T and local planners are encouraged to explore the feasibility and implications of these types of control measures in their jurisdictions and to educate stakeholders (e.g. school boards, the business community, etc.) should it become advisable to implement these types of restrictive measures.

2.6 Communications

The overarching objectives of communications preparedness are to prepare Canadians to take appropriate action during a pandemic, and to build and maintain the confidence of Canadians in our organizations (e.g. various levels of government, stakeholders). Pandemic influenza communications planning is based on a strategic risk communications approach. This approach focuses on developing communications that are based on a solid understanding of what people know about pandemic influenza, what they do not know, and what they want and need to know. Establishing a dialogue with citizens is the core of this approach. Citizens need to be engaged in a dialogue about pandemic influenza preparedness activities for several reasons:

- Citizens need to be aware of the planning and the preparedness activities so that they are better prepared to take action when they are asked.
- Successful implementation of the Plan during a pandemic hinges on the public and stakeholders having confidence in it and the process used to develop it.
- Citizen dialogue is essential for developing communications products that reflect what people want and need to know.
- Dialogue with citizens ensures that we are making well-informed decisions leading to responsible and ethical risk management.

As the pandemic evolves, the number of organizations that become involved with the media on this issue will be enormous; there will be financial issues, human resource issues and social issues—issues that affect every facet of society. Because of the broad scope of these issues, working towards the development of consistent, coordinated messages that various levels of government and stakeholders agree to in advance of a pandemic is critical to ensure that Canadians are prepared to take action to protect themselves and their loved ones.

The information demands during a pandemic will be sustained over a long period, resulting in tremendous information demands. Sustaining public confidence over many months will be a huge challenge that will require consistent and coherent messages.

All key stakeholders (external, internal, international) must receive consistent and relevant information in a timely manner during any type of emergency. Planning activities are to ensure

consistent and coherent messaging across Canada as well as predefining roles and responsibilities as much as possible.

The objectives of communication planning are to:

- Create a strong communications network (nationally and internationally).
- Define clear roles and responsibilities for each phase of the pandemic.
- Define a variety of communications options, strategies, methods, and tools at each stage.
- Develop consistent, coordinated messages for each pandemic period.

2.6.1 Current Status

i) Provincial, territorial and local

Most communication activities related to influenza take place immediately preceding and during the typical influenza season from October to May each year. The P/Ts produce materials to promote immunization each fall; these are specific to the programs they offer in their jurisdictions. Most communication materials and strategies, which target the general public, media, health care workers and other community organizations (considered as “external” key stakeholders), are geared to promoting immunization and reducing unnecessary hospital visits. These materials are developed at the P/T and local levels with minimal federal input. To date, there has not been a centrally coordinated education campaign with regard to pandemic influenza that targets the external key stakeholders. Although campaigns have not been centrally coordinated, substantial work is going into ensuring a greater coordination of key messages. Within the pandemic communications planning process, F/P/T and non-governmental organizations are working on the development of messages that can be adapted to the specific stakeholders in each jurisdiction.

ii) Federal, provincial and territorial

Communication with “internal” key stakeholders, mainly government decision makers and policy advisors, occurs at all levels of government. In addition, communications have established several communications networks for F/P/T interaction. A Health Emergency Communications Network (HECN) has been created. It was mobilized in response to the SARS outbreak and continues to be a key component in communication planning for pandemic influenza and other health emergencies. The HECN will be a key component of the pandemic influenza communications response. As well, a communications subcommittee has been created as part of the PIC and is responsible for pandemic influenza communications planning.

iii) Federal

Federal communications on influenza currently focus on the dissemination of surveillance data by FluWatch bulletins. These bulletins are directed to public health professionals, but they are available to the public through the PHAC Web site. They are produced on a weekly basis throughout the influenza season. Information about international influenza activity is disseminated by CIDPC, mainly through the Canadian Integrated Outbreak Surveillance Centre e-mail alert system or Web site postings, to key stakeholders as necessary. As well, fact sheets on influenza, including influenza vaccines, are posted on the HC Web site. The PHAC also communicates with “international” key stakeholders, including WHO and the Pan American Health Organization, about influenza activity within and outside of Canada.

For emergency situations, PHAC has a public information line that can be set up for “around-the-clock” coverage. Other communication issues are also being addressed as part of the “all hazards approach” to crisis communications.

2.6.2 Planning Principles and Assumptions

The guiding principles for pandemic influenza communications planning are as follows:

1) Pandemic influenza communications planning is based on a strategic risk communications approach that:

- Assures we openly communicate pandemic influenza risks and control options.
- Ensures transparency in the decisions we are making during the pandemic planning process.
- Where facts are uncertain or unknown, we will be clear about what gaps remain and what efforts are being made to fill them.

2) Our approach is a collaborative one that reflects the agreement reached among the PIC communications subcommittee members.

- Each level of government in Canada has stakeholders to whom they are responsible and responsibilities that it must fulfill.
- The work of the PIC communications subcommittee will acknowledge these differences while at the same time reflect the ongoing need for all levels of government to deliver a consistent message to the public during an influenza pandemic.

3) Stakeholders are a focal point of our approach.

- Those who face the greatest risk deserve the greatest attention as well as those who are most concerned with the management of particular risks.
- Stakeholders can provide valuable information, knowledge, expertise and insights throughout the process.

4) Strategic risk communications is itself a process requiring continuous evaluation and improvement. This must be built into our ongoing work plan for pandemic influenza communications.

- We will adopt scientific standards for our pandemic influenza communications that reflect the best natural and social sciences research for developing and evaluating our messages and processes.

5) The PIC communications subcommittee will work collaboratively with the technical experts on the PIC and its other subcommittees to ensure that communications planning reflects the best evidence and information available from the natural and social sciences.

- Sound scientific information and expert knowledge are the foundation for pandemic influenza planning. Communication plans must recognize expertise in the full set of relevant disciplines, as well as accommodate stakeholder knowledge.
- The relevance of the communicated information depends on the decision-making context and the outcomes that matter to stakeholders. The strategic risk communications process is the primary means for addressing these integrated communication needs and demonstrating that the risk management process has addressed them.

The PHAC Communications, through PIC and with stakeholders at the F/T and local levels, will coordinate and facilitate Canada's public health communications response to pandemic influenza. Stakeholders have varying roles and responsibilities; therefore, coordination is crucial to ensure that messages are accurate and consistent and that jurisdictional boundaries are respected.

The development of a strategic risk communications plan is underway and would become a key part of communications planning for pandemic influenza. The PHAC is working with P/T Ministries of Health to develop key messages and mechanisms to communicate these messages to target stakeholders.

3.0 Planning Activities and Preparedness Checklists

Planning and response activities can be broadly divided into four categories: prevention, preparedness, response and implementation, and post-event recovery and after care. During the Interpandemic Period, activities will focus on prevention and preparedness. Implementation of the response activities will occur in concordance with each change in Canadian Pandemic Phase. Recovery and evaluation activities will occur in the Post-Pandemic Period. Front-end investment of resources in prevention and preparedness activities will facilitate effective management of the pandemic and mitigation of negative outcomes.

To manage an emergency effectively, it is essential to have comprehensive response plans in place. With respect to pandemic planning, the existence of these plans needs to be communicated to all potential stakeholders. Copies should be distributed to organizations and individuals that will be involved in the pandemic response and, if possible, advance testing of these plans should be coordinated with a mechanism to provide feedback for improvement and updating.

In Annex A, Planning Checklists, planning activities are listed and grouped according to Plan components (i.e. surveillance, vaccine programs, antivirals, health services emergency planning and response, public health measures, communications). The checklists are designed to facilitate planning at the P/T and local levels, and they essentially reflect planning activities that should be undertaken during the Interpandemic Period.

Section Four Response



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1.0 Introduction

In this Response Section of the Canadian Pandemic Influenza Plan (the Plan), activities corresponding to each component (i.e. surveillance, vaccine programs, the use of antivirals, health services, public health measures and communications) are organized in a table format by each Canadian pandemic phase. The tables include the key actions necessary to facilitate a comprehensive and consistent response to pandemic alerts and an influenza pandemic. However, it is recognized that additional details and modifications will need to be added as the pandemic unfolds. For example, it cannot be determined in advance of the appearance of a novel virus when an effective vaccine might be available; therefore, all activities listed under “Vaccine Programs” in the tables may occur at different phases than the ones that are currently listed (in the tables).

2.0 Use of Pandemic Phases

The pandemic phases declared by the World Health Organization (WHO) are based on the evaluation of pandemic risk situations, with the declared phase representing the highest global risk. Therefore if there is concurrent circulation of two or more novel influenza viruses, the phase will correspond to the situation presenting the highest risk of pandemic. In April 2005, WHO published new terminology for pandemic phases, which replaced the terminology published in 1999. The new terminology includes six phases spanning three pandemic periods: Interpandemic Period, Pandemic Alert Period and the Pandemic Period. A Post-Pandemic Period has also been identified but it is not linked to a numerical phase.

To succinctly summarize the global situation and the situation in Canada, the Pandemic Influenza Committee (PIC) developed Canadian pandemic phase terminology that combines the WHO phase and an indicator of the highest level of novel influenza activity in Canada. The Canadian pandemic phases are described in the Background Section of the Plan. In general, the nomenclature is the WHO phase followed by a decimal point and then 0, 1 or 2 to indicate absence of cases, single (unlinked) cases, or localized or widespread activity in Canada (e.g. 3.1). This Response Section has been updated since it was first published in February 2004 to include this terminology.

For responders at the time of a pandemic, the focus will be on more localized “triggers” that may or may not correspond to the Canadian pandemic phase because the phase is based on the highest level of novel influenza activity observed in Canada. It is expected that differences in influenza activity within Canada will be described on the basis of surveillance data that is reported similarly to that during the annual influenza season. Planners at all levels in the health and emergency service sectors, from municipal to federal, are encouraged to think about the “phase” under which their specific jurisdictions would fall based on influenza activity within the jurisdictions. This is so they can operationalize an appropriate response for the jurisdiction, recognizing that their plans will also be affected by the epidemiology of the pandemic nationally and globally.

Other unknown factors (e.g. age distribution, severity of the illness caused by the pandemic strain, efficiency of transmission from human to human) will also affect the response measures. The Plan assumes that progression to a pandemic will occur if novel influenza activity occurring

during the Pandemic Alert Period is not halted. Therefore the response to novel virus activity during the Pandemic Alert Period may need to be significantly modified from what is outlined in this Plan if the epidemiology (e.g. of a domestic AI outbreak) does not suggest the need for aggressive measures.

3.0 Federal Emergency Response

Planning at the federal level has resulted in the development of a generic emergency management structure. This structure, which indicates roles and responsibilities of specific groups in response to an emergency, is included in Annex L, Federal Emergency Preparedness and Response System. The specific composition, roles and responsibilities of the Advance Planning Group still need to be determined; however, members that can provide technical advice specific to pandemic influenza will be essential.

Also included in Annex L is a flow diagram that aligns response activities with the phases. This tool provides a visual overview of the response from a federal perspective.

The Canadian Pandemic Influenza Plan is a disease-specific plan. It is an example of a specific, technical emergency plan that has been developed as part of much larger initiative to create plans to deal with all types of national emergencies. By creating a set of plans that are increasingly specific, i.e. range from generic emergency response issues to more specific threats (e.g. infectious diseases) and finally to detailed disease-specific threats, it is anticipated that a set of “nested” or linked documents will be available; these nested documents will be comprehensive and flexible enough to cover off any type of national emergency.

4.0 The Severe Acute Respiratory Syndrome Experience

Prior to March 2003, when the severe acute respiratory syndrome (SARS) arrived in Canada, the vast majority of health care professionals and certainly the general public had limited personal experience with large outbreaks of serious respiratory infections. The SARS outbreak caused an exponential increase in the knowledge of and experience with this type of health threat. Awareness of SARS, the severity of the illness, method of spread and the implementation of control measures penetrated Canadian society from coast to coast regardless of the actual case count in each province or territory.

Those involved in disease surveillance and pandemic planning saw SARS as a type of “dress-rehearsal” for pandemic influenza. They recognized that many of the response issues would be the same but on a much larger scale. Although the costs due to SARS were high in terms of morbidity and mortality and economic losses, the costs of pandemic influenza have the potential to be much greater. The response to pandemic influenza also would need to be sustained for a longer period of time and would likely include a mass immunization effort on top of the demands of acute care for patients.

The SARS experience reinforced the need for preparedness activities as cited in the Preparedness Section of the Plan. In particular, the need for resources and surge capacity within the health system to deal with public health emergencies is highlighted. Advanced preparation and removal of potential barriers in communication systems, data management technology, and the acquisition and mobilization of supplemental health care workers and settings are just a few of the other needs identified in the Plan and validated by the SARS experience.

It is with this experience behind us that those involved in drafting this Plan have identified the key action items listed in this Response Section.

5.0 Avian and Animal Influenza

Outbreaks caused by novel influenza viruses in avian or animal populations present opportunities for transmission to humans. Sporadic human infection with a number of avian (e.g. H5, H7, H9) and swine (e.g. H1N1) influenza subtypes have been documented. In addition, there may be opportunities for reassortment between animal and human influenza viruses when they simultaneously infect the same swine or human host. Such reassortment events may result in the development of a new influenza virus subtype with pandemic potential.

Since 2003, an unprecedented number of avian outbreaks of influenza have been detected worldwide. Human cases, ranging in severity from conjunctivitis to fatal cases, have resulted from these various outbreaks. The WHO global phases now include the occurrence of avian and animal influenza outbreaks and the role of these outbreaks as potential precursors to a pandemic.

As a result of the avian outbreak of H7N3 in British Columbia in 2004, a guideline document was developed by PHAC to provide recommendations for public health authorities and other stakeholders involved in the management of actual and potential human health issues related to domestic avian influenza outbreaks. This document has recently been updated and expanded to include guidance on the management of all AI events with potential human health implications (see Human Health Issues Related to Avian Influenza in Canada, on the PHAC website). Because the actions in the guideline document pertain to the new Canadian Phases 1.1, 2.1 and 3.1, the human health issues document is referenced in the tables in section 6 below. Although the control of animal influenza outbreaks is a key part of preventing the emergence of a human influenza pandemic—and there are critical animal and human health linkages—the responses to the actual animal outbreaks are best addressed in animal health guidelines and plans. The Canadian Food Inspection Agency (CFIA) is the lead agency for AI outbreak response and animal health and food safety issues.

6.0 Key Response Actions by Pandemic Phase

The key response actions listed in the following tables are organized by the component of the response to which they relate (Component) and by the phase during which each action should take place (Phase). High-level activities for emergency management and coordination have also been added to the tables. It is assumed that each jurisdiction will refer to the phase that is consistent with their respective levels of novel influenza activity. For example, if the southern part of one province is experiencing localized pandemic activity, the Canadian Phase would be 6.2 (the Canadian Phase always reflects the highest level of activity in the country) and the geographic areas or region with the activity would follow the actions under Phase 6.2.

However if no other pandemic activity was occurring in Canada at that time, then the areas with no known cases would take the actions consistent with Phase 6.0 until they started to experience pandemic activity.

As previously discussed, flexibility in the response is needed because the availability of resources (e.g. vaccine, antiviral drugs) may require deviation from the proposed sequence of response actions. It is expected that many of the response actions under each phase will need to occur

simultaneously. The action items have not been prioritized within each phase. More detailed actions are provided in many of the technical annexes.

Response actions and messages are organized by pandemic period rather than by Canadian phase in Annex K, Communications; therefore, readers are referred to this annex in each of the phase-specific tables below.

The tables also include Response Level designations (see legend below) that are provided for guidance only. It is likely that many response actions, especially those for which national consistency is desirable, will be led by PIC or collaborative federal, provincial, territorial processes. Other non-governmental responders (e.g. Salvation Army, Red Cross) will be likely involved in the response but have not been specifically identified in the Plan because it is anticipated that their respective roles and activities would be developed in conjunction with public health authorities at the P/T, regional and local level.

Legend for the Canadian Pandemic Phase Tables

Acronyms for organizations

CATMAT = Committee to Advise on Tropical Medicine and Travel
CEPR = Centre for Emergency Preparedness and Response
CDC = Centres for Disease Control and Prevention
CIHR = Canadian Institutes for Health Research
CHEMD = Council of Health Emergency Management Directors
CMDH = Chief Medical Officer of Health
CPHLN = Canadian Public Health Laboratory Network
ESS = Emergency Social Services
GOARN = Global Outbreak Alert and Response Network
HERT = Health Emergence, Response Teams
HPFB = Health Products and Food Branch
LCTF = Long-Term Care Facility
NACI = National Advisory Committee on Immunization
NESS = National Emergency Stockpiling System
NML = National Microbiology Laboratory
PHAC = Public Health Agency of Canada
PSEPC = Public Safety and Emergency Preparedness Canada
PWGSC = Public Works and Government Services Canada

Abbreviations for response levels

F = Federal
L = Local
P/T = Province/Territory

Note: The term “animal” in the tables below is intended to cover both avian and animal species.

6.1 Interpandemic Period

Canadian Phase 1.0	No new virus subtypes in humans, animals <i>outside</i> Canada may be infected with a new subtype that is considered low risk for humans		
Component	Focus	Actions	Response Level
Surveillance	Pandemic Preparedness activities	As per Preparedness Section	F, P/T, L
		<ul style="list-style-type: none"> Ensure links to veterinary counterparts are in place as part of general pandemic preparedness Routine human influenza surveillance 	
	Information sharing	Disseminate available surveillance information from countries experiencing animal cases and/or outbreaks to public health stakeholders	F (Lead: PHAC)
		Provide updates on ongoing risk assessment for pandemic influenza potential	F (Lead: PHAC)
Public Health Measures	Public education	If animal outbreaks are occurring: <ul style="list-style-type: none"> Provide general travel health information pertaining to safe food handling, respiratory etiquette 	
All other components	Pandemic Preparedness activities	As per Preparedness Section	
Emergency Management and Coordination		Develop/maintain response plans	F, P/T, L
		Explore need to stockpile (e.g. syringes, other medical supplies)	F, P/T, L
		Identify how essential services will be maintained during a pandemic	F, P/T, L
		Practice emergency plans	F, P/T, L
		Train staff that may be re-assigned during a pandemic	F, P/T, L

Canadian Phase 1.1	No new virus subtypes in humans, animal(s) <i>inside</i> Canada infected with a new subtype that is considered low risk for humans		
Component	Focus	Actions	Response Level
Surveillance, Vaccine Programs, Antivirals, Health Services, Public Health Measures, Communications	Veterinary Outbreak Control	As per <i>Human Health Issues Related to Avian Influenza in Canada</i> document; Rapid sharing of information among animal and human health professionals	F, P/T, L
	Prevention of Human Infection	Provide updates on ongoing risk assessment for pandemic influenza potential and make recommendations for increased vigilance for surveillance and public health action	F, P/T, L

Canadian Phase 1.1	No new virus subtypes in humans, animal(s) <i>inside</i> Canada infected with a new subtype that is considered low risk for humans		
Component	Focus	Actions	Response Level
Emergency Management and Coordination		Continue as per Phase 1.0 actions and; <ul style="list-style-type: none"> • Ensure that response network is ready to respond • Provide technical information liaison • Report situation to PSEPC (daily report) • Share PHAC/HC info with regional officers • Facilitate sharing of information between animal and human health authorities 	F, P/T, L F, P/T, L F (Lead : PHAC) F (Lead : PHAC) F (Lead : PHAC)

Canadian Phase 2.0	No new virus subtypes in humans, animals <i>outside</i> Canada infected with a new subtype that has a substantial risk for humans		
Component	Focus	Actions	Response Level
Surveillance, Vaccine Programs, Antivirals, Health Services, Public Health Measures, Communications	Pandemic preparedness, Information sharing, Public education	As per Phase 1.0 with messages reflecting the increased risk to human health	F, P/T, L
		Design and seek agreement on a common strategy for the communication of epidemiological data (nationally and with WHO internationally)	F, P/T, L
Emergency Management and Coordination		As per Phase 1.1 with increased communications/liaison with other government departments	F, P/T, L

Canadian Phase 2.1	No new virus subtypes in humans, animals <i>inside</i> Canada infected with a new subtype that has a substantial risk for humans		
Component	Focus	Actions	Response Level
Surveillance, Vaccine Programs, Antivirals, Health Services, Public Health Measures, Communications	Veterinary Outbreak Control	As per <i>Human Health Issues Related to Avian Influenza in Canada</i> document	F, P/T, L
	Prevention of Human Infection	All measures would reflect the increased risk associated with this novel virus	F, P/T, L
Emergency Management and Coordination		As per Phase 2.0	F, P/T, L

6.2 Pandemic Alert Period

Canadian Phase 3.0	Human infection(s) with a new virus subtype occurring <i>outside</i> Canada – no or at most rare instances of human to human transmission		
Component	Focus	Actions	Response Level
Surveillance	Establish and/or heighten existing surveillance systems	Verify epidemiological data and current risk assessment from official sources (WHO, Ministries of Health)	F (Lead : PHAC)
		Review and confirm that all inter-pandemic surveillance activities (via FluWatch) are operating optimally	
	Information sharing	Convey current international risk assessment in Canadian context	F, P/T, L (Lead PHAC)
		Provide information and national recommendations to F/P/T stakeholders	
Vaccine Programs	Mitigation of potential complications of influenza through use of current vaccine resources	Promote use of annual influenza vaccine	P/T, L
		Promote pneumococcal vaccination to “high-risk” and age-specific target groups to reduce the incidence and severity of secondary bacterial pneumonia	
		Collaborate on international vaccine development initiatives, including the development and testing of prototype vaccine strains as needed.	F (Lead: PHAC)
		Review pandemic vaccine infrastructure readiness with domestic manufacturer	F (Lead: PHAC)
Antivirals	Review of preparedness status and updating of strategy	Assess and/or re-assess availability of antiviral medications	F, P/T, L
		Review recommended priority groups and plans for antiviral use based on available epidemiological data	F, P/T
		• Consider adequacy of stockpiled quantities in light of estimated sizes of the respective priority groups in your jurisdiction	F, P/T
		Review and modify if necessary, contingency plans for storage, distribution and administration of antiviral drugs through public health and other providers to nationally defined priority groups	F, P/T, L

Canadian Phase 3.0	Human infection(s) with a new virus subtype occurring <i>outside</i> Canada – no or at most rare instances of human to human transmission		
Component	Focus	Actions	Response Level
	Communication and education	Communicate antivirals strategy as part of pandemic educational materials (including which priority groups will likely be covered, current supply and any shortfalls)	F, P/T, L
		Ensure staff are trained and infrastructure is in place to track who is receiving the drugs for the purpose of treatment and prophylaxis	F, P/T, L
Health Services	Evaluation of laboratory capacity Information gathering	Ensuring at least one laboratory within the P/T has the capability to isolate and subtype influenza virus, and if not establish anticipatory “back-up” process	P/T (Lead: CPHLN)
		Ensure that estimates of health care personnel capacity are current, i.e., estimated number of health care workers (HCWs) by type (physician, nurses, respiratory therapists, radiology technicians, etc), and by work setting (hospital, community, LTCF) • Identify if possible HCWs by type of work that they usually do	F, P/T, L
Public Health Measures	Information preparation	As per Annex M (Public Health Measures)	F, P/T, L
		Review and update educational materials on all aspects of influenza for health care professionals, travellers, other special audiences and the general public	
Communications		As per Annex K (Communications)	
Emergency Management and Coordination		Provide case count to PSEPC	F (Lead : PHAC)
		Notify P/T’s emergency service managers (ESS+CHEMD)	F (Lead : PHAC)
		Coordinate international consultations (WHO/CDC)	F (Lead : PHAC)
		Alert P/T’s	F (Lead : PHAC)
		Inform CMOH	F (Lead : PHAC)

Canadian Phase 3.1		Sporadic human infection(s) with a new virus subtype occurring <i>inside</i> Canada – no or at most rare instances of human to human transmission	
Component	Focus	Actions	Response Level
Surveillance	Monitoring of evolving situation	Investigation of sporadic cases, including collection of detailed epidemiologic data, contact tracing, and public health monitoring	F (Lead : PHAC), P/T
		Ensure that enhanced surveillance is in place across Canada for rapid detection of potential spread	
	Dissemination of data	Review/Revise standard reports for dissemination of epidemiological data within Canada	F (Lead: PHAC)
		Establish and convey current risk assessment to national and international surveillance partners	
		Dissemination of epidemiological data, as needed	F, P/T
		If occurring in conjunction with an animal outbreak in Canada – refer to <i>Human Health Issues Related to Avian Influenza in Canada</i> document for more details	
Vaccine Programs	Reduce potential for genetic re-assortment	Immunize close contacts of cases with annual influenza vaccine if available as per Annex M (Public Health Measures)	F, P/T, L
	Inventory and resource assessment	Conduct initial availability assessment of supplies (e.g. syringes, adrenalin, sharps disposal units), equipment and locations potentially required for a vaccine-based response (i.e., mass clinics)	
	Preparation (Legal, Educational etc.)	Develop list of currently qualified vaccinators and sources of potential vaccinators	F, P/T, L
		Review educational materials re. Administration of vaccines and adapt/ update as needed	F, P/T, L
		Ensure that any legal issues that may impede rollout of a mass immunization program are addressed	P/T, L
		Ensure domestic vaccine manufactures are alerted and participating in international efforts	F (Lead: PHAC)
Antivirals	Antiviral strategy	Use neuraminidase inhibitors for treatment of cases as per Annex M (Public Health Measures)	F, P/T (Lead: PHAC)
		Perform an inventory assessment (drugs, formulations, and expiry dates)	
		Test stockpiled antivirals for potency if necessary (i.e., if past expiry date)	

Canadian Phase 3.1		Sporadic human infection(s) with a new virus subtype occurring <i>inside</i> Canada – no or at most rare instances of human to human transmission	
Component	Focus	Actions	Response Level
Health Services	Rapid case confirmation	Laboratory testing as per Annex C (Laboratory Procedures)	P/T (Lead: CPHLN)
	Guideline review and/or revision	Review protocols and guidelines for prioritization of laboratory services during times of high service demand and staff and supply shortages	P/T (Lead: CPHLN)
	Preparation (Legal, Educational etc.)	Ensure that any legal and insurance issues that may impede recruitment and use of active and retired health care workers and volunteers have been addressed with P/T licensing bodies	P/T
		Prepare and/or update communications defining the extent of care that health care workers and volunteers can perform according to P/T laws and union agreements	P/T
	Case and contract management	Manage cases and contacts as per recommendations in Annex M (Public Health Measures) <ul style="list-style-type: none"> Isolation of cases Surveillance of contacts 	F, P/T, L
Public Health Measures	Resource assessment and preparation	Review staffing requirements for implementation of a pandemic response including mass immunization clinics, control measures, and public education	
		Consider delaying introduction of public health programs that may not be adequately resourced if situation evolves into a pandemic or other alternatives such as contracting out	P/T, L
		Preparation of educational material for public	F, P/T, L
Communications		As per Annex K (Communications)	
Emergency Management and Coordination		As per Phase 3.0 and; <ul style="list-style-type: none"> Report to International Health Regulations as required Assess risk and disseminate information to and with stakeholders Review NESS availability Review medical personnel availability Review federal legislative authorities Acquire (when available) and disseminate any laboratory testing materials (i.e., reagents) 	F (Lead : PHAC) F, P/T, L F (Lead : PHAC) F, P/T, L F, P/T, L F (Lead: NML/CPHLN)

Canadian Phases 4.0 and 5.0	Clusters with limited human-to-human transmission occurring <i>outside</i> of Canada, spread is localized, no cases in Canada		
Component	Focus	Actions	Response Level
Surveillance	Establish and/or Heighten enhanced surveillance systems	Verify epidemiological data and current risk assessment from official sources	F (Lead : PHAC)
		Enhance current surveillance activities based on circumstances	F, P/T, L
		Review and/or revise case definitions, minimum data sets, and data collection forms	F, P/T (Lead: PIC)
	Border issues	Implement border-based surveillance (depending on origin of cases) coordinated by CEPR, as per Annex M (Public Health Measures) <ul style="list-style-type: none"> ▪ Include notifications to ill and well travellers 	F, P/T (Lead: PHAC)
	Plan for streamlined data collection	Initiate ramped up surveillance activities to detect and monitor increased morbidity and mortality	P/T, L
	Dissemination of data	Review and/or revise standard reports for dissemination of epidemiological data within Canada	F, P/T, L
Vaccine Programs	Planning for vaccine distribution	Ongoing involvement in vaccine development initiatives	F (Lead: PHAC with vaccine manufacturers)
	Mass campaign infrastructure	Review and modify if necessary, contingency plans for storage, distribution and administration of influenza vaccine through public health and other providers to nationally defined high-priority target groups (See Annex J for use of non-traditional sites and workers)	F, P/T (Lead: PIC)
		Ensure staff are trained and infrastructure is in place to record immunizations, including requirements for a two-dose immunization program (i.e. re-call and record-keeping procedures)	P/T, L
		Review estimates of the number of people within the P/T who fall within each of the priority groups for vaccination (i.e., high risk groups, health care workers, responders, specific age groups) and access strategies	F, P/T, L
		Ongoing promotion of current annual influenza vaccine for NACI recommended groups and for travellers (as per CATMAT recommendations)	F, P/T (Lead: PIC/ NACI)

Canadian Phases 4.0 and 5.0	Clusters with limited human-to-human transmission occurring <i>outside</i> of Canada, spread is localized, no cases in Canada		
Component	Focus	Actions	Response Level
Antivirals	Supply of antiviral drugs	Perform an inventory assessment of available supplies	F, P/T (Lead: PHAC)
	Planning for antiviral drug distribution and tracking	Review recommended priority groups and plans for antiviral use based on available epidemiological data	F, P/T (Lead: PIC)
		Review and modify if necessary, contingency plans for storage, distribution and administration of antiviral drugs through public health and other providers to nationally defined high-priority target groups	F, P/T, L
		Review estimates of the number of people within the P/T who fall within each of the priority groups for receipt of antiviral drugs (i.e., high risk groups, health care workers, responders, specific age groups) and access strategies	F, P/T, L
		Ensure staff are trained and infrastructure is in place to track who is receiving the drugs for the purpose of treatment and prophylaxis	P/T, L
Health Services	Prepare for management of suspect cases detected through enhanced surveillance	Implement/Review infection control precautions for case management	F, P/T, L (Lead: PHAC)
		Review national recommendations for clinical management of cases and modify if necessary	F, P/T (Lead: PIC)
		Anticipate and plan to mobilize human and financial resources	F, P/T, L
	Preparation for increased demand on acute care sites	Review and update local and P/T data on the number & type of health care facilities, and capacity: hospital beds, ICU beds, swing beds, LTC beds with enhanced level of care, emergency department, ventilatory capacity, oxygen supply, antibiotic supply	P/T, L
		Conduct availability assessment of medications, supplies and equipment potentially needed for the response	P/T, L
		Review, modify, and distribute P/T guidelines (or national guidelines) for prioritizing health care needs and service delivery, accessing resources and implementing infection control measures during a pandemic	F, P/T, L
		Disseminate information on medical supply stockpiles and potential need for, and sources of, additional supplies	F, P/T (Lead: PHAC)

Canadian Phases 4.0 and 5.0	Clusters with limited human-to-human transmission occurring <i>outside</i> of Canada, spread is localized, no cases in Canada		
Component	Focus	Actions	Response Level
Health Services		Review, modify, and distribute detailed regional and facility-level plans for providing health services during a pandemic, including the type of care to be delivered at non-traditional health care settings and the triage across sites; human resource, material and financial resource needs and directions regarding prioritizing patient care	P/T, L
		Disseminate strategy for collecting and monitoring data on health care service use and demands	P/T, L
Public Health Measures	Preparation of educational materials and public health resources	Review national recommendations as per Annex M (Public Health Measures) for public health management of cases and other control measures and modify if necessary	F, P/T (Lead: PIC)
		Ensure adequate resources are available to implement recommended public health measures including isolation of cases	P/T, L
		Prepare and revise (if necessary) educational and guidance materials for public health partners (specifically provincial/territorial and local health departments who will be on the front lines with respect to prevention and control measures), the general public; some documents for the public should emphasize infection control in homes, schools, places of work	F, P/T, L
Communications		As per Annex K (Communications)	
Emergency Management and Coordination		For Phase 4.0 -actions as per Phase 3.1 and;	
		• Prepare to respond to GOARN request for participation	F (Lead : PHAC)
		• Anticipate and plan to mobilize human and financial resources	F, P/T, L
		• Disseminate information on medical supply stockpiles and potential need for sources of additional supplies	F, P/T, L
		• Alert voluntary organizations	F, P/T, L
		For Phase 5.0 -actions as per Phase 4.2	F, P/T, L

Canadian Phases 4.1 and 5.1		Sporadic infection(s) with virus that has demonstrated limited human-to-human transmission detected in Canada. No clusters identified in Canada but clusters have occurred <i>outside</i> of Canada	
Component	Focus	Actions	Response Level
Surveillance	Prompt identification of any secondary cases Collect, compile and distribute epidemiological data for cases reported in Canada	Collection and dissemination of epidemiological and clinical data for cases occurring in Canada	F, P/T, L
		Review and if necessary, revise case definitions, minimum data sets, and data collection forms	
		Review protocols for special studies and prepare dedicated teams as necessary to ensure prompt activation of the studies when appropriate	F, P/T, L (Lead: CIHR or other NGO)
Vaccine Programs	Vaccine development	Ongoing involvement in vaccine development, testing and production initiatives	F (Lead: PHAC HPFB, manufacturers)
	Preparation for mass immunization clinics	Review and modify if necessary, plans for vaccine security (i.e., during, transport, storage and clinic administration)	P/T, L
	Implementation of targeted immunization clinics	If a potentially effective vaccine is available: <ul style="list-style-type: none"> Follow national recommendations for use of the available vaccine Implement streamlined VAAE surveillance, in collaboration with PHAC Arrange for direct shipping of vaccine to health districts 	P/T, L F, P/T, L (Lead: PHAC) F (Lead: PWGSC)
Antivirals	Localized use of antivirals (treatment and prophylaxis of contacts) for containment purposes	Treat cases and provide prophylaxis for contacts of cases, based on local epidemiology and available supplies as per Annex M (Public Health Measures)	P/T, L
		Ensure prompt mobilization of antivirals supplies allocated for early containment	F, P/T (Lead: PHAC)
		Ensure that stakeholders are aware of how to report adverse drug reactions if antivirals are being used	F, P/T, L
Health Services	Use of optimal infection control practices to prevent spread	As per Phase 3.1 and; Evaluate infection control and occupational health recommendations and practices and revise as necessary	F, P/T (Lead: PHAC)
Public Health Measures	Resource and risk assessment	Ensure adequate resources are available to implement recommended public health measures including isolation of cases	P/T, L

Canadian Phases 4.1 and 5.1		Sporadic infection(s) with virus that has demonstrated limited human-to-human transmission detected in Canada. No clusters identified in Canada but clusters have occurred <i>outside</i> of Canada	
Component	Focus	Actions	Response Level
		Establish current level of risk to guide public health actions (e.g. transmission characteristics associated with secondary cases)	P/T, L
	Case and Contact management	Manage cases and contacts as per recommendations in Annex M (Public Health Measures) <ul style="list-style-type: none"> • Isolate cases • Quarantine or activity restriction of contacts • Update educational material (with Communications staff) 	P/T, L
	Advance planning	Review staffing requirements for implementation of a pandemic response including mass immunization clinics, control measures, and public education	P/T, L
		Consider delaying introduction of public health programs that may not be adequately resourced if situation evolves into a pandemic or other alternatives such as contracting out	P/T, L
Communications		As per Annex K (Communications)	
Emergency Management and Coordination		For Phase 4.1 -actions as per Phase 4.0	F, P/T, L
		For Phase 5.1 -as per Phase 4.2 and; <ul style="list-style-type: none"> • Prepare dedicated team as necessary 	F, P/T, L

Canadian Phases 4.2 and 5.2		Localized cluster(s) with limited human-to-human transmission occurring in Canada but spread is localized, suggesting that the virus is not yet well adapted to humans or fully transmissible	
Component	Focus	Actions	Response Level
Surveillance	Timely collection, compilation and dissemination of epidemiological and clinical data	Refer to actions from phase 4.1, 5.1	F (Lead: PIC)
		Revise case definitions based on observed clinical presentation of cases	F, P/T, L
		Implement any special studies identified for these phases	F, P/T, L (Lead: CIHR or other NGOs)
Vaccine Programs	Vaccine development	Ongoing involvement in vaccine development, testing, and production initiatives	F (Lead: PHAC HPFB, manufacturers)

Canadian Phases 4.2 and 5.2	Localized cluster(s) with limited human-to-human transmission occurring in Canada but spread is localized, suggesting that the virus is not yet well adapted to humans or fully transmissible		
Component	Focus	Actions	Response Level
	Preparation for mass immunization clinics	Review recommended priority groups for immunization based on available epidemiological data	F, P/T (Lead: PIC)
		Review and modify if necessary, plans for vaccine security (i.e., during, transport, storage and clinic administration)	P/T, L
	Implementation of targeted immunization clinics	As per Phases 4.1 and 5.1, if a potentially effective vaccine is available	
		<ul style="list-style-type: none"> • Follow national recommendations for use of the available vaccine 	P/T, L
<ul style="list-style-type: none"> • Implement streamlined VAAE surveillance, in collaboration with PHAC 		F, P/T, L (Lead: PHAC)	
Antivirals	Localized use of antivirals (treatment and prophylaxis of contacts) for containment purposes	As per Phases 4.1 and 5.1	
		<ul style="list-style-type: none"> • Treat cases and provide prophylaxis for contacts of cases, based on local epidemiology and available supplies as per Annex M (Public Health Measures) 	P/T, L
		<ul style="list-style-type: none"> • Ensure prompt mobilization of antivirals supplies allocated for early containment 	F, P/T (Lead: PHAC)
Health Services	Use of optimal infection control practices Management of increased demand on health care system	Evaluate infection control and occupational health recommendations and practices and revise as necessary	F, P/T (Lead: PHAC)
		Ensure protocols and guidelines for prioritization of laboratory services during times of high service demand and staff and supply shortages have been distributed	P/T, L
		Review and implement mechanisms for coordinating patient transport and tracking/managing beds (e.g. central bed registries, call centre and centralized ambulance dispatch)	P/T, L

Canadian Phases 4.2 and 5.2	Localized cluster(s) with limited human-to-human transmission occurring in Canada but spread is localized, suggesting that the virus is not yet well adapted to humans or fully transmissible		
Component	Focus	Actions	Response Level
Public Health Measures	Outbreak control and containment	Manage cases and contacts as per recommendations in Annex M (Public Health Measures) <ul style="list-style-type: none"> ▪ Isolate cases ▪ Quarantine or activity restriction of contacts 	F, P/T, L
		Evaluate interventions and revise recommendations as necessary	F, P/T
		Integrate national recommendations for isolation into practice at the local level	P/T, L
		Implement use of mandatory isolation orders if necessary	F, P/T
		Review and, if necessary, update and disseminate national recommendations regarding containment strategies (i.e., cancellation of public gatherings, school closures) as per Annex M (Public Health Measures)	P/T, L
		Monitor and track compliance with containment recommendations	L
		Develop or update educational materials for the public and health care providers as the situation evolves	F, P/T, L
Communications		As per Annex K (Communications)	
Emergency Management and Coordination		For Phase 4.2 -actions as per Phase 4.0 <ul style="list-style-type: none"> ▪ Consider sending a Liaison Officer to CDC (and vice versa) ▪ Implement use of mandatory isolation orders if necessary in federal jurisdictions 	F (Lead : PHAC)
			F (Lead : PHAC)
		For Phase 5.2 -actions as per Phase 5.1	

6.3 Pandemic Period

Canadian Phase 6.0	Outside Canada, increased and sustained transmission in the general population has been observed (i.e., pandemic activity). No cases have been identified in Canada		
Component	Focus	Actions	Response Level
Surveillance	Timely collection, compilation and dissemination of epidemiological and clinical data	Verify international epidemiological data and current risk assessment from official sources	F (Lead: PHAC)
		Revise case definitions based on international assessment of observed clinical presentation of cases	F (Lead: PHAC)
		Distribute data collection forms and database transmission instructions and protocols if not done previously	F, P/T (Lead: PHAC)
		Follow any new recommendations regarding a switch-over to aggregate reporting of data	F, P/T (Lead: PHAC)
		Review protocols for special studies and prepare dedicated teams as necessary to ensure prompt activation of the studies when appropriate	F, P/T, L (Lead: CIHR or other NGO)
Vaccine Programs	Vaccine development	Ongoing involvement in vaccine development, testing and production initiatives	F (Lead: PHAC HPFB, manufacturers)
		Preparation/ Implementation of mass immunization clinics	Review and if necessary revise recommended priority groups for immunization based on available epidemiological data	F, P/T (Lead: PIC)
	Modify or refine nationally defined priority target groups depending on local circumstances		P/T, L
	Modify or refine other aspect of the federal guidelines, as needed for P/T and local application		P/T, L
	Review and modify if necessary, plans for vaccine security (i.e., during, transport, storage and clinic administration)		P/T, L
	When vaccine is available	<ul style="list-style-type: none"> ▪ National coordination on vaccine purchase ▪ Activate immunization clinic capability ▪ Implement streamlined VAAE surveillance, in collaboration with PHAC ▪ Arrange for direct shipping of vaccine to health districts 	F, P/T (Lead: PWGSC) P/T, L F, P/T, L (Lead: PHAC) F (Lead: PWGSC)

Canadian Phase 6.0		Outside Canada, increased and sustained transmission in the general population has been observed (i.e., pandemic activity). No cases have been identified in Canada	
Component	Focus	Actions	Response Level
		Communicate with bordering jurisdictions (other P/Ts and the U.S.) to facilitate awareness of the vaccine distribution plan and coordination and collaboration on efforts as much as possible	F, P/T, L
Antivirals	Strategic and controlled use of antivirals	Review and if necessary revise national recommendations on antiviral use based on available epidemiological data	F, P/T (Lead: PIC)
Health Services	Use of optimal infection control practices Preparation for increased demand on health care system	Evaluate infection control and occupational health recommendations and practices and revise as necessary	F, P/T (Lead: PHAC)
		Review protocols and guidelines for prioritization of laboratory services during times of high service demand and staff and supply shortages	P/T, L
		Review mechanisms for coordinating patient transport and tracking/managing beds e.g. central bed registries, call centre and centralized ambulance dispatch	P/T, L
		Contact and prepare sources of additional HCWs and volunteers i.e., Emergency Measures Organizations and NGOs (Red Cross, St. John ambulance)	F, P/T, L (Lead: PHAC)
		Acquire extra supplies needed to provide medical care in non-traditional sites	P/T, L
Public Health Measures	Preparation of implementation of public health response	As per Phases 4.0 and 5.0	
		Review national recommendations as per Annex M (Public Health Measures) for public health management of cases and other control measures and modify if necessary	F, P/T, L
		Ensure adequate resources are available to implement recommended public health measures including isolation of cases	P/T, L
		Prepare and if necessary revise educational and guidance materials for public health partners (specifically, P/T and local health departments who will be on the front lines with respect to prevention and control measures), the general public; Some documents for the public should emphasize infection control in homes, schools, places of work	F, P/T, L

Canadian Phase 6.0	Outside Canada, increased and sustained transmission in the general population has been observed (i.e., pandemic activity). No cases have been identified in Canada		
Component	Focus	Actions	Response Level
Communications		As per Annex K (Communications)	
Emergency Management and Coordination		As per Phase 5.1 <ul style="list-style-type: none"> • Ensure NESS resources are ready to be deployed • Contact and prepare sources of additional HCWs and volunteers (NGO's) 	

Canadian Phases 6.1 and 6.2	Pandemic virus detected in Canada (Phase 6.1 – single case(s) occurring, Phase 6.2 – localized or widespread activity occurring)		
Component	Focus	Actions	Response Level
Surveillance	Timely collection, compilation and dissemination of epidemiological and clinical data	6.1: Confirm that clinical spectrum of disease (based on feedback from local level experts), is consistent with what is being observed internationally (revise case definitions if necessary)	F, P/T, L
		6.2: Scale back to streamlined surveillance	F, P/T (Lead: PHAC)
		6.2: Implement any special studies identified for these phases	F, P/T, L (Lead: possibly PHAC, PIC and/or CIHR)
	Monitoring the progress of pandemic	6.2: When indicators suggest activity appears to be decreasing (i.e., end of a pandemic wave) <ul style="list-style-type: none"> • Determine ongoing surveillance needs for both documentation of end of first wave and detection of any new cases or outbreaks 	F, P/T, L (Lead: PIC)
Vaccine Programs	Vaccine development	As per Phase 6.0 (i.e., if not completed prior to Phase 6.1 or 6.2)	F (Lead: PHAC HPPFB, manufacturers)
		• Ongoing involvement in vaccine development, testing and production initiatives	
	Preparation/ Implementation of mass immunization clinics	• Review and if necessary revise recommended priority groups for immunization based on available epidemiological data	F, P/T (Lead: PIC)
		• Modify or refine nationally defined priority target groups depending on local circumstances	P/T, L
		• Modify or refine other aspect of the federal guidelines, as needed for P/T and local application	P/T, L

Canadian Phases 6.1 and 6.2		Pandemic virus detected in Canada (Phase 6.1 – single case(s) occurring, Phase 6.2 – localized or widespread activity occurring)	
Component	Focus	Actions	Response Level
		<ul style="list-style-type: none"> Review and modify if necessary, plans for vaccine security (i.e., during, transport, storage and clinic administration) 	P/T, L
		As per Phase 6.0, when vaccine is available	
		<ul style="list-style-type: none"> National coordination on vaccine purchase 	F, P/T (Lead: PHAC)
		<ul style="list-style-type: none"> Activate immunization clinic capability 	P/T, L
		<ul style="list-style-type: none"> Implement streamlined AEFI surveillance, in collaboration with PHAC 	F, P/T, L (Lead: PHAC)
		<ul style="list-style-type: none"> Arrange for direct shipping of vaccine to health districts 	F (Lead: PWGSC)
		<ul style="list-style-type: none"> Communicate with bordering jurisdictions (other P/Ts and the U.S.) to facilitate awareness of the vaccine distribution plan and coordination and collaboration on efforts as much as possible 	F, P/T, L
Antivirals	Strategic and controlled use of antivirals	If not previously completed in Phase 6.0, review and if necessary revise national recommendations on antiviral use based on available epidemiological data	F, P/T (Lead: PIC)
		Based on local epidemiology and available supplies, administer antiviral treatment and prophylaxis according to national priority groups	F, P/T, L
		Communicate with bordering jurisdictions to facilitate awareness of any antiviral distribution plans	F, P/T, L
		If antivirals are being used, ensure that stakeholders are aware of how to report adverse drug reactions	F, P/T (Lead: HPFB)
		Monitor for drug resistance	F, P/T, L (Lead: NML)
Health Services	Management of increased demand on health care system	<p>Mostly Phase 6.2 actions:</p> <ul style="list-style-type: none"> Implement protocols and guidelines for prioritization of laboratory services during times of high service demand and staff and supply shortages Implement mechanisms for coordinating patient transport and tracking/managing beds e.g. central bed registries, call centre and centralized ambulance dispatch 	<p>P/T, L</p> <p>P/T, L</p>

Canadian Phases 6.1 and 6.2	Pandemic virus detected in Canada (Phase 6.1 – single case(s) occurring, Phase 6.2 – localized or widespread activity occurring)		
Component	Focus	Actions	Response Level
		<ul style="list-style-type: none"> ▪ Access sources of additional HCWs and volunteers i.e., Emergency Measures Organizations and NGOs (Red Cross, St. John ambulance) ▪ Acquire extra supplies needed to provide medical care in non-traditional sites and open non-traditional sites as needed ▪ Coordinate clinical care and health services activities with bordering jurisdictions to avoid migration to centres of perceived enhanced services ▪ Monitor capacity of mortuary and burial services as well as need for social and psychological services for families of victims; Implement and establish alternative sites for provision of services as necessary ▪ Track national stocks of medications as well as necessary medical equipment and supplies, including ventilators, oxygen, etc. Consider strategies to mitigate shortfalls 	<p>F, P/T, L (Lead: PHAC)</p> <p>P/T, L</p> <p>P/T, L</p> <p>P/T, L</p> <p>P/T, L</p>
Public Health Measures	Implementation of public health response	<p>Case and contact management as per Annex M (Public Health Measures) for Phase 6.1 and 6.2</p> <p>Discontinue quarantine strategy if previously implemented</p> <p>Shift-focus to self-care and self-monitoring as case numbers increase, with concurrent increase in public education messaging</p> <p>Implement national recommendations regarding control strategies (i.e., cancellation of public gatherings, school closures)</p>	<p>F, P/T, L</p> <p>F, P/T, L</p> <p>F, P/T, L</p> <p>P/T, L</p>
Communications		As per Annex K (Communications)	

Canadian Phases 6.1 and 6.2	Pandemic virus detected in Canada (Phase 6.1 – single case(s) occurring, Phase 6.2 – localized or widespread activity occurring)		
Component	Focus	Actions	Response Level
Emergency Management and Coordination		For Phase 6.1 as per Phase 6.0 and; <ul style="list-style-type: none"> ▪ Consider declaring Public Welfare Emergency (as per Emergencies Act) ▪ Track National stocks. Consider strategies to mitigate shortfalls ▪ Discontinue border strategies ▪ Conduct prediction analysis ▪ Define clinical spectrum of disease ▪ Review mass facilities plan ▪ Review distribution policy of resources allocation ▪ Assign medical and other resources ▪ Access sources of additional HCW's and volunteers 	F F (Lead : PHAC) F (Lead : PHAC) F (Lead : PHAC) F F, P/T, L F (Lead : PHAC) F, P/T, L F, P/T, L
		For Phase 6.2 as per Phase 6.1 and; <ul style="list-style-type: none"> ▪ Monitor and adjust ▪ Advise and assist P/T's on establishment and operations of non-traditional health care sites and clinics ▪ Deploy HERT strategically for maximum benefit ▪ Continue consultation with health sector partners ▪ Planning for illness in the response team ▪ Plan for emergency financial resources ▪ Promote optimal use of emergency resources ▪ Assess increased demand on health care system 	F, P/T, L F (Lead : PHAC) F (Lead : PHAC) F, P/T, L F, P/T, L F, P/T, L F, P/T, L F, P/T, L

6.4 Post-Pandemic Period

The following actions that pertain to the Post-Pandemic Period have been retained in this section of the Plan pending completion of the Recovery Section (anticipated for next edition of the Plan).

Component	Focus	Actions	Response Level
Surveillance	Review, evaluation and return to routine operations	Resume routine ongoing laboratory and disease surveillance	F, P/T, L
		Estimate burden of disease during outbreak periods	F, P/T
		Evaluate surveillance during the pandemic and make recommendations for improvements	F, P/T
Vaccine Programs	Review, evaluation, resumption of routine programs	Provide recommendations for routine prevention and control including recommendations for vaccines	F, P/T (Lead: PIC / NACI)
		If vaccine was available and administered in earlier phase(s)	
		<ul style="list-style-type: none"> • Expand vaccine programs to cover population not yet immunized 	P/T, L
		<ul style="list-style-type: none"> • Summarize and report coverage data (with one and/or two doses) and AEFI data • Examine vaccine efficacy • Review and if necessary revise guidelines and/or protocols used during the mass campaigns 	F, P/T, L F, P/T (Lead: PIC / NACI) P/T, L
Antivirals	Review and evaluation	Perform inventory assessment and ongoing monitoring of antiviral availability	F, P/T (Lead: PHAC)
		Evaluate effectiveness of strategic antiviral use (in Canada and/or based on international reports)	F, P/T (Lead: PIC)
		Summarize and report antiviral resistance data	F (Lead: NML)
		Summarize and report adverse drug reaction data	F (Lead: HPFB)
		Provide recommendations for the strategic use of antivirals during a pandemic based on lessons learned within Canada and internationally	F, P/T (Lead: PIC)

Component	Focus	Actions	Response Level
Health Services	Review, evaluation, return to routine operations	Review and activate aftercare and recovery plans and guidelines	P/T, L
		Review and revise (if necessary) clinical management guidelines	F, P/T (Lead: PIC)
		Review and revise (if necessary) infection control guidelines	F, P/T (Lead: PIC)
		Review and revise (if necessary) guidelines for management of mass fatalities (if applicable)	F, P/T (Lead: PIC)
		Close or reduce use of “alternate care” and “over-flow sites”	P/T, L
		Restock laboratory supplies and resume routine laboratory services	F, P/T, L
		Develop projections for future laboratory requirements (i.e., human and physical resources including test kits, etc.)	F, P/T
		Summarize, evaluate and report on the use of social and psychological services for families of victims	P/T, L
		Track national stocks of medications as well as necessary medical equipment and supplies, including ventilators, oxygen, etc. Consider strategies to mitigate shortfalls in next wave or pandemic	F, P/T, L
Public Health Measures	Review, evaluation, resumption of routine programs	Review and revise (if necessary) public health management guidelines	F, P/T (Lead: PIC)
		Document and report lessons learned	F, P/T, L
		Update educational materials	F, P/T, L
		Resume routine public health activities and programs	F, P/T, L
		Promote immunization for influenza and other secondary infections observed during the pandemic (if appropriate and applicable)	P/T, L
		Disseminate all revised guidelines to appropriate stakeholders	F, P/T, L
		Evaluate the effectiveness of public health measures (e.g., closure of schools or other institutions etc.)	F, P/T, L
		Provide recommendations for routine prevention and control including recommendations for any control measures other than vaccines and antivirals	F, P/T (Lead: PIC)
		Provide lessons learned for ourselves and the public and prepare for the next emerging infectious disease	F, P/T, L
Communications		As per Annex K (Communications)	

Component	Focus	Actions	Response Level
Emergency Management and Coordination		Assess lessons learned	F, P/T, L
		Assess impact	F, P/T, L
		Update plans	F, P/T, L
		Restock supplies and equipment	F, P/T, L
		Implement recovery measures as required	F, P/T, L
		Update educational materials	F, P/T, L

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Planning Checklists

Date of Latest Version: October 2006

Summary of Significant Changes:

- This is a new annex as the content of this document was previously included in the Preparedness Section of the Plan
- No significant changes have been made to the content

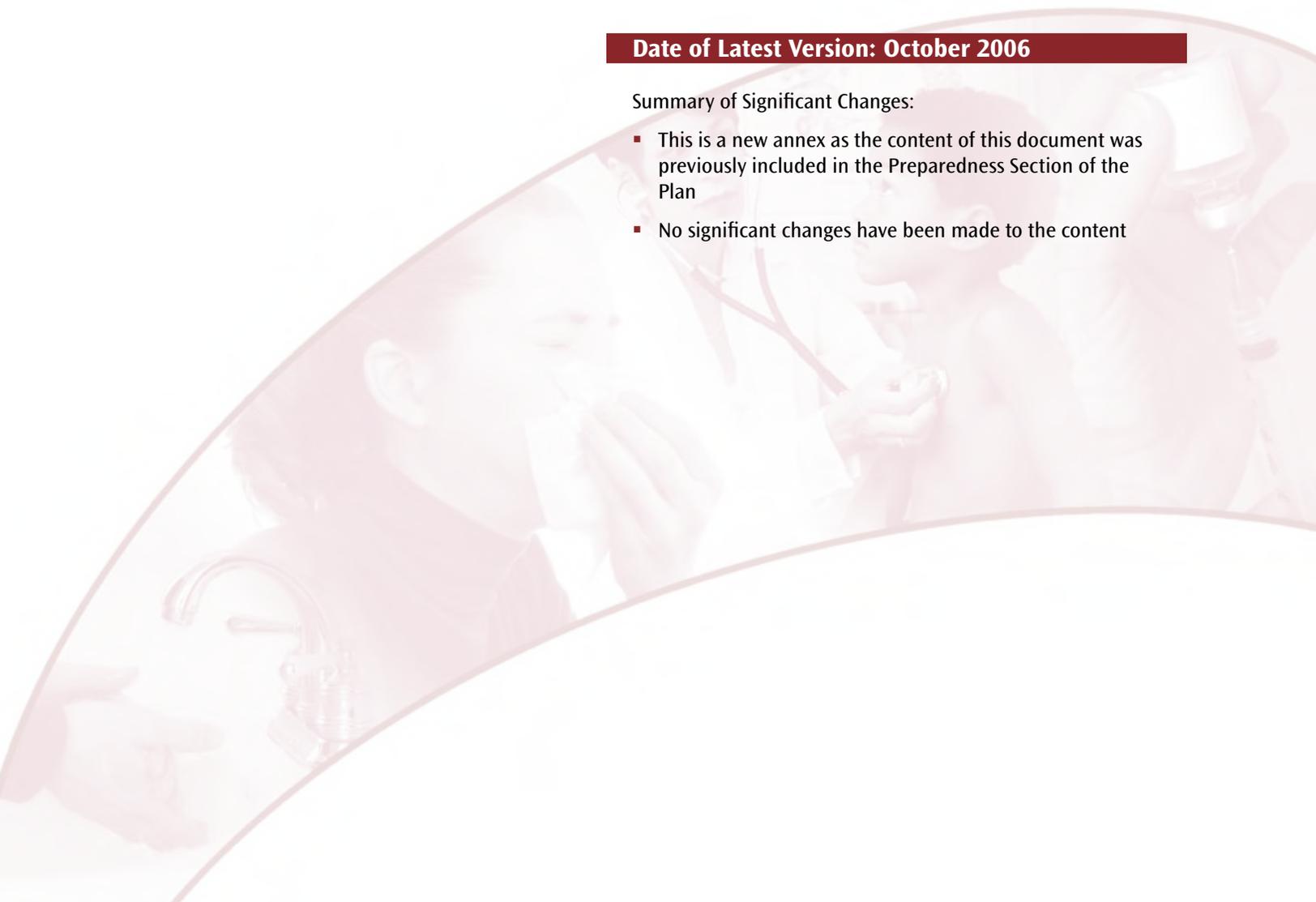


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1.0 Introduction

Planning for a pandemic involves the consideration of what activities are necessary for optimal management of each stage of the pandemic. This annex provides a preliminary list of planning activities developed to facilitate planning at provincial and territorial (P/T) and local levels. These checklists will need to be reviewed on a regular basis and updated as they are completed. These planning activities should take place during the Interpandemic Period (i.e. WHO Phases 1 and 2) with the recognition that, when novel strains are detected or pandemic alerts are issued, they will need to be reviewed and adapted as necessary.

Activities have been listed and grouped in this annex according to the following components of the Plan:

- Surveillance
- Vaccine Programs
- Antivirals
- Health Services Emergency Planning and Response
- Public Health Measures
- Communications

The list for the former “Emergency Services” component of the Plan has been retained for reference purposes and appears following the Communications component in this annex.

Many of these activities and corresponding federal activities and responsibilities have been discussed and addressed by the various pandemic planning working groups. Refer to the Introduction and Background sections of the Plan for further information on these roles and responsibilities.

1.1 Surveillance Checklist

- Improve disease-based surveillance, in collaboration with the Centre for Infectious Disease Prevention and Control (CIDPC), Public Health Agency of Canada PHAC; includes improvements to the current system and consideration of enhancements (e.g. emergency room surveillance and real-time influenza mortality surveillance).
- Improve virologic surveillance capability by ensuring that at least one laboratory in the P/Ts has the capability to isolate and subtype influenza virus.
- Establish links with avian and swine influenza surveillance contacts within P/Ts.
- Develop and/or disseminate protocols and guidelines for the prioritization of laboratory services during times of high-service demand and staff and supply shortages.
- Develop and improve communication mechanisms for the rapid and timely exchange of surveillance information between P/Ts, CIDPC and local stakeholders.
- Consider how special studies, identified in collaboration with CIDPC, may be activated in your jurisdiction.

- Determine what information needs to be collected and how this will be done (to facilitate the evaluation of surveillance activities in the Post-pandemic Period, including socio-economic evaluations).

1.2 Vaccine Programs Checklist

- Enhance annual influenza vaccination coverage rates in NACI-recommended high-risk groups, particularly groups with low coverage levels.
- Increase annual influenza vaccination coverage rates among health care and essential services workers.
- Increase pneumococcal vaccination coverage levels in NACI-recommended high-risk groups (to reduce the incidence and severity of secondary bacterial pneumonia).
- Consider P/T modifications or refinements of nationally defined priority target groups, depending on local circumstances. For example, there may be specific groups of people in selected P/Ts whose absence due to influenza illness could pose serious consequences in terms of public safety or disruption of essential community services (e.g. nuclear powerplant operators, air-traffic controllers at major airports, workers who operate major telecommunications or electrical grids)
- Develop contingency plans for storage, distribution and administration of influenza vaccine through public health and other providers to nationally defined high-priority target groups, including:
 - mass immunization clinic capability in P/Ts,
 - locations of clinics (e.g. central sites, pharmacies, work place),
 - vaccine storage capability (i.e. identify current and potential contingency depots),
 - numbers of staff needed to run immunization clinics,
 - plans to deploy staff from other areas from within and outside public health organizations to assist in immunization,
 - advance discussions with professional organizations and unions regarding tasks outside routine job descriptions during a pandemic,
 - training plans for deployed staff, and
 - how to identify and target individuals belonging to priority groups (recognizing that the strategy will involve immunizing the whole population as soon as possible but that prioritization may be necessary for the first batches of vaccine that become available).
- Explore stockpiling syringes and other immunization clinic supplies
- Determine how receipt of vaccine will be recorded and how a two-dose immunization program will be implemented in terms of necessary recall and record-keeping procedures.
- Determine the number of people in P/Ts who fall within each of the priority groups for vaccination (e.g. high-risk groups, health care workers, emergency service workers, specific age groups).
- Verify the capacity of suppliers for direct shipping to health districts.

- Develop plans for vaccine security:
 - during transport,
 - during storage, and
 - at clinics
- Ensure that appropriate legal authorities are in place to allow for the implementation of major elements of a proposed distribution plan. (For example, will P/T laws allow for non-licensed volunteers to administer influenza vaccine? Do P/T laws allow for “mandatory” vaccination of certain groups if vaccination of such groups is viewed by the P/T public health officials as essential to public service?)
- Coordinate proposed vaccine distribution plans with bordering jurisdictions.
- Enhance the surveillance for adverse events following immunization in collaboration with CIDPC.
- Determine what information needs to be collected and how this will be done (to facilitate the evaluation of pandemic vaccine program activities in the post-pandemic period, including socio-economic evaluations).
- Review and modify plans as needed on a periodic basis.

1.3 Antivirals Checklist

- Estimate the quantity of antiviral drugs that would be required to implement national antiviral strategy in your jurisdiction.
- Inform stakeholders of antiviral strategy implementation plans, (including expected supply and use).
- Modify and refine the guidance provided by the Antivirals Working Group, as needed for P/T and local application (e.g. plan how to distribute available antivirals).
- Determine how stockpiled drugs will be stored, monitored (e.g. stability testing) and distributed.
- Monitor national antiviral stockpile storage conditions and shelf-life status on an ongoing basis.
- Determine what information needs to be collected and how this will be done (to facilitate evaluation of an antiviral response in the post-pandemic period, including socio-economic evaluations).

1.4 Health Services Emergency Planning and Response Checklist

- Develop P/T guidelines (modify federal guidelines) for prioritizing health care needs and service delivery, accessing resources and implementing infection control measures during a pandemic.
- Ensure that liability, insurance and temporary licensing issues for active and retired health care workers (HCWs) and volunteers are addressed with P/T licensing bodies. Define the extent

of care that health care workers and volunteers can perform according to P/T laws and union agreements.

- Purchase in bulk and stockpile extra medical supplies. Explore the options for stockpiling extra medical supplies and identify sources for additional supplies.
- Develop mechanisms for coordinating patient transport and tracking and managing beds (e.g. central bed registries, call centre, centralized ambulance dispatch).
- Develop detailed regional and facility-level plans for providing health services during a pandemic, including the type of care to be delivered at different health care settings and the triage across sites. Identify human resource, material and financial resource needs and consider priorities for patient care.
- Assess health care personnel capacity: estimate number of HCWs by type (e.g. physician, nurses, respiratory therapists, radiology technicians, etc), and by work setting (e.g. hospital, community, long-term care facility, paramedical); estimate number of non-active HCWs (retired)
- Determine sources from which additional HCWs and volunteers could be acquired, include Emergency Measures Organizations and NGOs (Red Cross, St. John Ambulance) in pandemic planning.
- Determine the number and type of health care facilities, and estimate their capacity (e.g. hospital beds, intensive care unit beds, swing beds, emergency department, ventilatory capacity, oxygen supply, antibiotic supply).
- Determine potential non-traditional sites and corresponding “parent” organizations for medical care provided they meet the criteria in Annex F, Infection Control and Occupational Health. Possible sites could include shelters, schools, gymnasiums, nursing homes and day care centres.
- Identify sources of extra supplies needed to provide medical care in these non-traditional sites.
- Determine the capacity of mortuary and burial services as well as social and psychological services for families of victims.
- Coordinate clinical care and health services plans with bordering jurisdictions to avoid migration to centres of perceived enhanced services.
- Develop aftercare and recovery plans and guidelines.
- Ensure that guidelines are distributed to regional and local jurisdictions.
- Determine what information needs to be collected and how this will be done (to facilitate evaluation of the impact of the pandemic on health services in the post-pandemic period, including socio-economic evaluations).
- Review and modify plans as needed on a periodic basis.

1.5 Public Health Measures Checklist

- Coordinate professional and public education strategy for each phase.
- Identify staffing needs and resource requirements for the management of cases and contacts occurring in your jurisdictions during the Pandemic Alert Period and Pandemic Period.

- Train staff that may need to be re-assigned to work on the pandemic response, and identify what and how other essential and non-deferrable public health programs could be maintained during a pandemic.
- Develop protocols for case and contact management, including the implementation of antiviral strategy, quarantine and community-based measures.
- Develop protocols for school closures and cancelling or restricting public gatherings.
- Determine how changes in case and contact management and community-based control measures will be implemented and communicated to the public and pandemic responders.
- Engage community stakeholders (e.g. school boards, businesses) in the planning process for community-based control measures.
- Assess how border measures may impact your jurisdiction and inform and plan with stakeholders (e.g. airports) how these measures can be coordinated.
- Consider how measures to limit the spread of a novel virus emerging in a community, including “exit screening” (if required) might be implemented at various levels (e.g. town, urban centre, region, P/T) within your jurisdiction.

1.6 Communications Checklist

(Refer to matrix in Annex K, Communications)

2.0 Emergency Response and Coordination Activities: Checklist for Provinces and Territories

- Identify the advantages of declaring a P/T emergency during a pandemic.
- Develop contingency plans to provide food, medical and other essential life-support needs for persons confined to their homes by choice or by direction from P/T and local health officials.
- Ensure communication among P/T Ministries of Health and emergency responders organizations as well as among other P/T ministries or departments that would be impacted by a pandemic.
- Within P/Ts, estimate numbers of emergency services workers including police, fire, correctional, military, funeral services, utilities, telecommunications and F/P/T and local leaders (e.g. political leaders, managers of response teams) essential to pandemic response.
- Identify military personnel and voluntary organizations that would assist during a pandemic.
- Develop a list of essential community services (and corresponding personnel) whose absence would pose a serious threat to public safety or would significantly interfere with ongoing response to the pandemic.
- Develop contingency plans for emergency backup of such services and/or provision of replacement personnel.
 - Replacement personnel could come from lists of retired personnel and/or government or private-sector employees with relevant expertise.
- Conduct environmental assessments of surge capacity of hospitals, non-traditional sites and other facilities including ventilation, water sources, etc.

- Develop aftercare and recovery plans and guidelines.
- Determine what information needs to be collected and how this will be done (to facilitate the evaluation of the emergency response in the post-pandemic period, including socio-economic evaluations).
- Conduct simulation exercise(s).

Pandemic Influenza Planning Considerations in On-reserve First Nations Communities

Date of Latest Version: June 2005

This Annex is currently under review. A draft revised version is expected in January 2007.

Summary of Significant Changes:

The revised version will reflect the following:

- clarification from the F/P/T Health Ministers meeting on roles and responsibilities;
- progress made by First Nations communities with regards to pandemic influenza planning;
- First Nations and Inuit Health Branch involvement in various new fora related to pandemic influenza planning;
- National and Provincial Aboriginal Organizations' involvement in pandemic influenza planning.

Note: The First Nations and Inuit Health Branch will undertake the necessary consultations for the revision of this annex.

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1.0 Introduction

The national pandemic influenza plan provides a framework that will guide planning in all jurisdictions in Canada including on-reserve First Nations (FNs) communities¹. Annex B of the plan has been developed based on a request to Health Canada's First Nations and Inuit Health Branch (FNIHB) from the Pandemic Influenza Committee (PIC) to describe some of the unique issues related to pandemic planning in FNs communities.

Annex B outlines some of the key activities needed to have sufficient pandemic influenza planning for on-reserve FNs communities and proposes the respective roles and responsibilities of various jurisdictions.

On-reserve FNs pandemic influenza planning needs to be integrated into a seamless system of planning across all Canadian jurisdictions.

This Annex B document is the result of extensive consultation with key stakeholders. Input on the draft document was sought from FNIHB regional public health staff (including medical officers and nurses), members of the federal/provincial/territorial Pandemic Influenza Committee, the Centre for Emergency Preparedness and Response at the Public Health Agency of Canada, the Assembly of First Nations, and the National Aboriginal Health Organization. The document was refined based on comments received from all of these groups.

2.0 Current Status

Health Canada's First Nations and Inuit Health Branch (FNIHB) delivers public health services to the First Nations who live on non-transferred federal reserves. In transferred communities that have accepted funding and responsibility for public health services, FNIHB provides the funding, but FNs communities are responsible for providing the services. In order to do this, transferred FNs communities can hire their own public health professionals or enter into agreements with provincial or regional health authorities for the provision of these services. It is important to note that FNIHB requires transferred communities to have an emergency preparedness plan as a condition of receiving federal transferred funding for public health. However, those emergency preparedness plans do not address specific public health emergencies, such as pandemic influenza. FNIHB, through its regional offices, will assume an intermediary role between provinces and transferred communities.

Provision of public health services, including pandemic influenza planning, to Inuit populations and to FNs communities living in the Territories is primarily the responsibility of the territorial governments². Territorial governments provide public health services in an integrated fashion to all residents regardless of ethnicity.

Currently, the federal, provincial and territorial governments also share the delivery of other health services to the First Nations and Inuit population. Provinces provide universal insured health services (including physician and hospital services) to all citizens, including Aboriginal

1 This document focusses on "on-reserve First Nations communities" living in the provinces for which there are concerns over clarity of roles and responsibilities for public health services (including pandemic influenza planning) among the various jurisdictions.

2 Seven Inuit communities and two Innu communities in Labrador fall under FNIHB's public health programming.

peoples on/off- reserve, except in remote isolated, isolated and some semi-isolated on-reserve communities where the primary health care is delivered by FNIHB-employed registered nurses.

While most of the FNIHB regions have been participating in the provincial committees for pandemic influenza planning, there are very few formal agreements between Health Canada FNIHB regional offices and the provincial governments on the management of outbreaks of pandemic influenza in FNs communities. Nevertheless, progress has been made in this area.

All FNIHB regions have developed draft or final regional pandemic influenza plans or guiding frameworks to assist FNs communities in developing their community pandemic influenza plans. Other FNIHB regions are in the process of negotiating roles and responsibilities with their respective provinces for dealing with pandemic influenza.

In some regions, meetings between FNIHB and FNs to raise awareness of the need for community-level planning on pandemic influenza have occurred and, as a result, some communities have developed their community plans. In other regions, health directors from FNs communities are engaged directly with their respective provincial/district/regional health authorities on pandemic influenza planning to clarify the issues of acute care and client management in the event of pandemic influenza outbreaks.

In practice, there have always been informal collaborations between provincial governments and FNIHB for management of public health emergencies and disease outbreaks in on-reserve FNs communities. It is important to emphasize, however, that there are some gaps in these collaborations. For example, there have been occasions when FNIHB medical officers have not been notified by provincial/regional counterparts of cases of communicable disease (e.g. meningitis) occurring on a reserve and where FNIHB regional medical officers are the identified lead for the public health response to such cases. Furthermore, this informal collaboration with provinces and FNIHB regions has not been tested during a massive national public health emergency, such as pandemic influenza.

3.0 Outstanding Issues

Linkages with Provincial/Territorial (P/T) Public Health Authorities

- Formal agreements between provincial public health and FNIHB regional offices on co-ordination of roles and responsibilities during public health emergencies, including pandemic influenza.
- Formal agreements between provincial public health and FNIHB regional offices to include on-reserve FNs numbers into the provincial/regional plans for purchase of antivirals, vaccines (when developed), and other relevant emergency supplies, and to clarify who would be the gatekeeper for these limited supplies/products.
- Clear protocols for on-reserve FNs communities to access the antivirals, vaccines and other emergency supplies in a coordinated fashion with the provinces.
- Communication protocols between FNIHB regional offices, transferred bands and provinces on issues related to communicable diseases and other public health concerns.

Legal Authority

- Clarity among the provinces, regional health authorities, the First Nations, and FNIHB regional offices on the legally recognized medical officer of health for each on-reserve FNs community

Resources

- Capacity at the FNIHB regional level and at the FNs community levels to deal with outbreaks of pandemic influenza due to limited public health infrastructure for FNs communities and shortage of public health human resources.
- Surveillance, epidemiology and influenza vaccination program data of on-reserve population for proper pandemic planning.

4.0 Next Steps

While FNIHB is working on assessing and addressing the issue of public health infrastructure and the deficiency of public health human resources in FNs communities and at FNIHB regional levels, it is crucial that planning for management of pandemic influenza in FNs communities be a coordinated effort involving all jurisdictions. The on-reserve FNs communities, with the support of FNIHB and provincial/regional health authorities, are responsible for developing their community pandemic influenza plans. However, the successful implementation of these plans requires a coordinated effort involving all key stakeholders (i.e. the FNs communities, FNIHB and provincial/regional health authorities). FNIHB regional offices would lead in facilitating the process among stakeholders.

Table 1 illustrates some of the key activities required for adequate pandemic planning for on-reserve populations. It includes proposed roles and responsibilities of the various jurisdictions who will be facilitating the planning or be involved in the planning. This table was developed because for public health issues of on-reserve populations, the multiple jurisdictional involvement has often created confusion over roles and responsibilities. To effectively deal with pandemic influenza outbreaks in on-reserve FNs communities, the roles and responsibilities of the various jurisdictions must be clear to all in advance.

Table 1 – The Key Activities and Proposed Roles and Responsibilities of Partners on Management of Pandemic Influenza in On-reserve First Nations Communities

1. FNs Communities

- 1.1 Develop community pandemic influenza plans in collaboration with the respective FNIHB region and/or the local/regional health authority, specifically:
- a) identify provincial/regional Medical Officer of Health (MOH) for the community and establish formal arrangements for ongoing MOH services
 - b) identify partners and clarify their roles and responsibilities;
 - c) enhance community awareness;
 - d) train front line staff³;
 - e) enhance community surveillance activities for early detection of influenza-like illness (ILI);
 - f) enhance triage/screening capacity;
 - g) develop capacity for patient isolation in health care facilities in FNs communities;
 - h) implement infection control guidelines and public health measures at the time of pandemic, in consultation with FNIHB regional medical officers, regional health authorities, and in accordance with the national pandemic plan;
 - i) develop and regularly update communication plan;
 - j) maintain ongoing stock and inventory of emergency supplies (e.g. masks, gloves, etc.);

³ Should include training of front-line health care workers on diagnosis and care, infection control, public health measures, surveillance and communication.

Table 1 – The Key Activities and Proposed Roles and Responsibilities of Partners on Management of Pandemic Influenza in On-reserve First Nations Communities

- k) calculate and regularly update the number of individuals (within FNs communities) in each priority group for vaccines and antivirals;
- l) plan for mass immunization, in collaboration with FNIHB regional medical officers, and/or provincially recognized medical officers of health;
- m) communicate and discuss with health authorities in neighbouring municipalities the transfer of severe pandemic influenza cases to hospitals and ensure equitable access for such cases;
- n) assess the current means of patient transportation to provincial/regional health care system (when required) and examine their appropriateness during pandemic influenza (i.e. identify the gaps and develop strategies to address them);
- o) plan ahead of time to ensure maintenance of essential services⁴ in the community;
- p) develop a contingency plan to enhance the knowledge of FNs people on how to deal with situations when there are severe shortages of health care workers and health care services⁵ as a result of pandemic influenza;
- q) develop formal partnership agreements between FNs communities to allow for mutual aid;
- r) institute emergency response team;
- s) participate in simulation exercises with the respective neighbouring municipalities for testing of preparedness and response plan for pandemic influenza at the community level; and
- t) actively participate in local pandemic influenza planning (in neighbouring municipalities) to facilitate coordination of efforts and integration with provincial/regional systems in dealing with pandemic influenza.

2. FNIHB Regions

- 2.1 Develop FNIHB regional pandemic influenza plans, in consultation with FNs communities and FNs regional organizations, and integrate with provincial systems where possible. More specifically:
- 2.1.1 Develop formal agreements, through negotiation, with provincial health authorities to clarify and co-ordinate mutual roles and responsibilities for:
 - a) procurement and distribution of vaccine/antivirals/emergency supplies (e.g. supplies for diagnosis, treatment, infection control, immunization);
 - b) enhanced surveillance capacities, in conjunction with provincial system, with the ability to separate out surveillance data for on-reserve FNs;
 - c) assistance with public health/medical care services in overwhelming situations;
 - d) clarity on the legally recognized medical officer of health for each FNs reserve;
 - e) two-way communication on case reporting;
 - f) defined roles and responsibilities of provincial/regional vs FNIHB public health authorities on needed activities for pandemic influenza preparedness and response; and
 - g) establishment of a means of transportation for respiratory specimens to provincial public health laboratories, when necessary.
 - 2.1.2 develop partnership with Indian and National Affairs Canada at the regional level towards integration of health emergencies with the overall emergency preparedness planning;
 - 2.1.3 develop communications plans;
 - 2.1.4 identify partners and clarify their roles and responsibilities;
 - 2.1.5 participate in simulation exercises with province(s) for testing of preparedness and response plan for pandemic influenza at FNIHB regional level;
 - 2.1.6 partner with FNIHB Headquarters to develop educational material;

⁴ Such as maintenance of fire-fighting/policing, maintenance of water/energy/food availability, management of mass fatalities.

⁵ Should include monitoring of illness, provision of care at home and use of infection control measures and communication.

Table 1 – The Key Activities and Proposed Roles and Responsibilities of Partners on Management of Pandemic Influenza in On-reserve First Nations Communities

- 2.1.7 identify current means of distribution of supplies to FNs communities and examine their appropriateness in health emergencies, such as pandemic influenza (i.e. identify gaps and develop strategies to address them);
- 2.1.8 identify and address the financial, human resource and legislative gaps in the current system;
- 2.1.9 plan for mass immunization of priority groups with pandemic influenza vaccine (when available);
- 2.1.10 support training of front-line staff in communities;
- 2.1.11 inform community leaders about pandemic influenza and its implications for their communities;
- 2.1.12 support and facilitate community planning by raising awareness, providing training sessions on planning, and providing educational material to FNs community leaders and regional FNs organizations;
- 2.1.13 provide public health services/recommendations/advice to FNs communities;
- 2.1.14 plan for provision of rapid diagnostic tests to health care facilities, if necessary;
- 2.1.15 provide names and contact information of FNIHB regional leads on pandemic influenza to other partners;
- 2.1.16 keep track of number of individuals (within FNs communities) in each priority group for vaccination; and
- 2.1.17 develop regional surveillance capacities (to be integrated with provincial system).

3. FNIHB Headquarters

- 3.1 Develop an overarching framework for Branch pandemic influenza preparedness and response plan, specifically:
 - a) combine regional and HQ plans into FNIHB organizational pandemic influenza plan;
 - b) based on the national pandemic influenza plan, develop generic training modules for community front-line health care workers and community leaders that are clear and culturally appropriate;
 - c) develop a cross-regional human resource mobilization plan (from HQ to FNIHB Regions);
 - d) develop communications plan; and
 - e) develop capacity for central data compilation and analysis to determine the overall burden of disease for FNIHB clientele.
- 3.2 Support and facilitate FNIHB regional pandemic planning by providing coordination and resources.
- 3.3 Work with provincial officials to clarify federal and provincial legislation and authorities in the event of pandemic influenza on reserves.
- 3.4 Identify national partners and work with them to define various roles and responsibilities.
- 3.5 Link with national FNs leaders/organizations to increase awareness of pandemic influenza and the necessity for community planning.

4. Provincial Public Health Authorities

- 4.1 Work with First Nations and FNIHB regional offices during the development of provincial pandemic influenza plans to define roles and responsibilities, coordinate efforts, and prevent gaps in the management of pandemic influenza in FNs communities.
- 4.2 Develop formal agreements, through negotiation, with FNIHB regional offices to incorporate on-reserve FNs people into the provincial planning activities, where possible, and specifically for:
 - a) procurement and distribution of vaccine/antivirals/emergency supplies (e.g. supplies for diagnosis, treatment, infection control, immunization);

Table 1 – The Key Activities and Proposed Roles and Responsibilities of Partners on Management of Pandemic Influenza in On-reserve First Nations Communities

<p>b) enhanced surveillance capacities with the ability to separate out surveillance data specific to on-reserve FNs;</p> <p>c) two-way communication on case reporting;</p> <p>d) facilitation of on-reserve FNs communities' access to federal emergency services such as the National Emergency Stockpile System (NESS) and the Health Emergency Response Team (when it is established) when community and FNIHB resources are overwhelmed and where available⁶;</p> <p>e) if PH capacity permits, assistance in the provision of PH services to FN communities when community and FNIHB resources are overwhelmed⁷; and</p> <p>f) clarity on the legally recognized medical officer of health for each FNs reserve.</p> <p>4.3 Ensure equitable access to hospital care for transferred, severe pandemic influenza cases.</p> <p>4.4 Work with federal officials to clarify federal and provincial legislation and authorities in the event of pandemic influenza on reserves.</p> <p>4.5 Develop communication plan (with FNIHB regional offices and other key players).</p>
<p>5. Centre for Emergency Preparedness and Response (CEPR)</p> <p>5.1 Communicate with FNIHB regularly and effectively on matters related to emergency preparedness and response.</p> <p>5.2 Provide timely opportunities to FNIHB to input into the federal/provincial/territorial (FPT) Networks on Emergency Preparedness and Response and provide regular and timely feedback to FNIHB on developments at the FPT Networks on Emergency Preparedness and Response that affect FNIHB's progress on emergency planning (including pandemic influenza planning).</p> <p>5.3 Invite FNIHB to FPT Network on Emergency Preparedness and Response when the focus of discussion has implications for FNIHB HQ, FNIHB regions, and FNs communities with regard to pandemic influenza planning. This will ensure that FNIHB, CEPR and Provincial health/social services authorities work together in an integrated/coordinated manner to prevent gaps and duplications when managing outbreaks of pandemic influenza in FNs communities.</p> <p>5.4 In situations where FNIHB's regional capacity (including provincial aid) is exhausted, CEPR could deploy available Health Emergency Response Team (HERT), when it is established, to FNs communities (through provincial systems of deployment) to assist FNIHB regional health professionals in responding to public health emergencies, such as pandemic influenza⁸.</p> <p>5.5 Through provincial system for access to the National Emergency Stockpile System (NESS) within a province, provide access to the federally-controlled pharmaceuticals and other emergency supplies/ services for FNs communities.</p> <p>5.6 Facilitate linkages between FNIHB and provincial authorities to discuss and clarify the provincial roles and responsibilities in FNs communities access to NESS and HERT, as per letter of agreement between Centre for Emergency Preparedness and Response, the Public Health Agency of Canada, and the First Nations and Inuit Health Branch, Health Canada.</p> <p>5.7 Provide courses/training on pandemic planning and setting up clinics for mass immunization.</p>

6 FNIHB regional offices must make such requests to the provincial public health authorities, which would provide such services through coordination with the Centre for Emergency Preparedness and Response (CEPR).

7 For provinces that do not have a public health service delivery mandate at the provincial level, these responsibilities could be relevant to regional health authorities.

8 It is expected that federal assistance would be available to on-reserve FNs communities and the rest of the province in an equitable fashion.

Note: INAC (Indian and Northern Affairs Canada) has responsibility for overall emergency preparedness. In the event of a health emergency, including pandemic influenza, INAC's role is to facilitate communication with First Nations and support Health Canada and the Public Health Agency of Canada when required.

Table 1 – The Key Activities and Proposed Roles and Responsibilities of Partners on Management of Pandemic Influenza in On-reserve First Nations Communities

5.8 Provide technical consultations to FNIHB staff on development of educational modules and courses on pandemic influenza for community health care providers and other first responders in FN communities and facilitate on-line delivery of courses through existing mechanisms.
5.9 Provide technical assistance to FNIHB HQ for development and testing of preparedness and response plan for pandemic influenza (e.g. taking part in federal/national simulation exercises).

5.0 Conclusion

The management of a predictable pandemic influenza in FN communities will require a coordinated effort involving all levels of government. Considerations of the unique needs of FN communities must be reflected in plans at the local, P/T and federal levels. The goal of pandemic influenza preparedness and response is: “First, to minimize serious illness and overall deaths, and second to minimize societal disruption among Canadians as a result of an influenza pandemic.” These goals will only be achieved if strategies and specific plans for FN communities are integrated within the pandemic plans of all jurisdictions.

Pandemic Influenza Laboratory Guidelines

Date of Latest Version: September 2008

Summary of Significant Changes:

- An executive summary has been added.
- Contents have been organized by topic-highlighting the laboratory response during the various pandemic phases.
- 10 key pandemic preparedness recommendations for laboratories.



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I. Preamble

The Pandemic Influenza Laboratory Preparedness Network (PILPN) of the Canadian Public Health Laboratory Network (CPHLN) has developed this document in accordance with the defined phases of the *Canadian Pandemic Influenza Plan for the Health Sector*. Laboratory testing, laboratory-based surveillance and data collection, communication issues and pandemic preparedness are addressed from the perspective of the Canadian pandemic phases. This document provides general guidelines to facilitate a consistent approach to laboratory testing for influenza during the Interpandemic, Pandemic Alert and Pandemic Periods and is intended for laboratory professionals.

II. Executive Summary

In the event of pandemic influenza, laboratories will be instrumental in facilitating the delivery of rapid and appropriate public health responses. During a pandemic, laboratory testing will accomplish the following:

- identify the earliest Canadian cases of a novel influenza strain;
- support public health surveillance by monitoring the geographic spread of disease and the impact of interventions;
- facilitate clinical treatment by distinguishing patients infected with the pandemic influenza virus from those with other respiratory diseases until the pandemic strain has been shown to be the predominant virus in a community;
- monitor circulating influenza viruses for antiviral resistance; and
- assess influenza vaccine efficacy.

Annex C – Pandemic Influenza Laboratory Guidelines provides recommendations to Canadian influenza testing facilities on laboratory testing, surveillance and data collection, communication and pandemic preparedness planning. In addition, as the laboratory working group of the Pandemic Influenza Committee (PIC), PILPN has made recommendations as to the minimum requirements necessary for the provision of public health laboratory services during an influenza pandemic (Appendix B).

Laboratory responsibilities will depend upon the pandemic phase. During the Interpandemic and Pandemic Alert Periods, it is recommended that influenza testing laboratories perform testing in support of routine influenza surveillance, laboratory-based detection of novel influenza subtypes and preparedness planning.

Once human-to-human transmission of a novel influenza strain has become established in Canada, the demand for laboratory testing will reach unprecedented levels. Laboratories must be prepared to respond accordingly.

During the Pandemic Period (Phase 6.0–6.2), influenza testing laboratories will support epidemiological efforts to track the spread and trend of the pandemic, and to monitor antiviral resistance. It is assumed that, during this period, diagnosis of influenza will be made primarily by clinical assessment.

In order to assist with preparations for a potential pandemic, this document provides a number of planning assumptions. Laboratories are encouraged to review laboratory functions, both influenza and non-influenza related. Human resource issues must also be considered. Most importantly, laboratories should focus on strengthening capacity before the arrival of a pandemic in Canada.

III. Key PILPN Recommendations

1. During seasonal influenza, PILPN recommends the use of rapid detection methods in conjunction with cell culture and nucleic acid testing (NAT) to aid in timely diagnosis, particularly during outbreaks. Serologic testing is of limited usefulness in the diagnosis of acute influenza and therefore is not recommended.
2. PILPN recommends that public health laboratories (PHLs) and local clinical laboratories develop influenza testing strategies for a pandemic. This should include the establishment of protocols to process and identify novel influenza subtypes that may be considered Risk Group 3 pathogens.
3. Laboratory testing algorithms should emphasize the use of NAT complemented by viral culture (in a certified containment level [CL]-3 laboratory) and validated direct fluorescent antibody assay (DFA). Ongoing development of NAT methods for the rapid detection of novel influenza subtypes can be undertaken using conventional or real-time reverse transcriptase polymerase chain reaction (RT-PCR) methods. This may include the utilization of a “universal” detection protocol that would identify any influenza A virus using primers to a conserved region within the genome and subsequent subtyping using primers specific for avian subtypes with pandemic potential, e.g. H5, H7 and human subtypes H1, H2, H3.
4. At present, point-of-care (POC) tests are not recommended for the detection of novel influenza subtypes. POC refers to any rapid test that utilizes rapid antigen detection techniques to identify the influenza virus. Refer to Appendix C for an excerpt on rapid testing taken from Québec’s *Preparation for an Influenza Pandemic*. The utility of these tests will be reassessed as data on their performance characteristics are obtained.
5. Other novel diagnostic protocols should be explored, such as the development of protocols for the simultaneous detection and subtyping of defined influenza A viruses.
6. In accordance with the response plan outlined by PIC, PILPN recommends that each province and territory (P/T) ensure that at least one laboratory within the P/T has the capability to determine the subtype of the influenza A virus and, if this is not possible, to establish appropriate alternative arrangements. This must include the development of NAT protocols that are capable of identifying a subtype of novel strains of influenza A. The National Microbiology Laboratory (NML) will supply the protocols, primers and reagents necessary to develop and evaluate these assays along with controls required for a quality assurance program.
7. PILPN recommends that all PHLs and other laboratories that routinely test for influenza submit data on influenza testing during the influenza season to the Public Health Agency of Canada (PHAC) on a weekly basis or more frequently if requested by PHAC. These data are reported and disseminated through the Respiratory Virus Detection System and FluWatch.
8. PILPN recommends that NML develop the capacity to produce and evaluate in-house production of alternative sources of reagents, such as monoclonal antibodies for DFA testing, which could be stockpiled and distributed to diagnostic laboratories across the country during a pandemic, when commercial reagents may be in short supply.

9. PILPN recommends that communication between animal and human influenza testing facilities be strengthened.
10. PILPN recommends that each province have an influenza surveillance committee in place. This should include a laboratory representative familiar with issues related to influenza diagnostics and pandemic planning in order to ensure that there is good communication among the provincial laboratory, provincial epidemiologists and health units. The committee will deal primarily with influenza in the event of a pandemic, but it will deal with other surveillance issues at other times as required. The committee should include, at a minimum, a provincial epidemiologist, the provincial laboratory director and the chief medical officer of health or respective designates.

IV. Laboratory Testing

A. Interpandemic Period – Canadian Pandemic Phases 1.0, 1.1, 2.0, 2.1

1. Methodology

Influenza testing facilities will maintain routine laboratory diagnostic services for influenza by performing

- virus isolation in cell culture
- direct antigen detection, i.e. DFA, enzyme immunoassay (EIA), rapid POC testing*
- NAT, such as RT-PCR, or nucleic acid sequence-based amplification.

Outside of influenza seasons, severe respiratory illness (SRI) cases will require a comprehensive workup using standard methods for respiratory pathogens.

2. Specimen Type, Collection and Transport

For seasonal influenza, a nasopharyngeal sample (NPS) is recommended as the preferred specimen because it yields the best results in most direct antigen tests as well as in cell cultures. Please see appendix D for the appropriate NPS procedure.

Throat swabs are not recommended because of their poor sensitivity for antigen- and culture-based assays. However, throat swabs and nasopharyngeal (NP) washings may be acceptable or recommended by the manufacturers of specific rapid detection kits.

Nasal swabs may be an acceptable alternative in children, particularly when a NAT is used.

Specimens should be collected as soon as symptoms develop, because viral shedding is maximal at the time of onset of illness and generally decreases to undetectable levels by five days in immunocompetent adults. Viral shedding may last longer in children and immunocompromised patients; hence, collection after five days of illness may still be useful in this setting.

Laboratories will follow appropriate *Transportation of Dangerous Goods* regulations for the shipment of influenza specimens.

3. Disinfection Procedures

Laboratories will follow appropriate disinfection procedures according to the specimen type.

4. Biosafety Considerations

Laboratories will follow appropriate biosafety guidelines, as prescribed by the Office of Laboratory Security, Centre for Emergency Preparedness and Response (CEPR).

* Because of the suboptimal positive predictive value during periods of low influenza activity, diagnosis by rapid POC tests must be interpreted with caution and confirmed by DFA, viral culture or NAT. Complete details regarding World Health Organization (WHO) recommendations on the use of rapid testing for influenza, including a review of the currently available kits, can be found at: http://www.who.int/csr/disease/avian_influenza/guidelines/rapid_testing/en/index.html

5. **Antiviral Susceptibility**

Early-season and late-season isolates can be submitted to the NML for resistance testing to amantadine and neuraminidase inhibitors as agreed upon by NML in conjunction with PHLs. NML will undertake investigations related to surveillance for resistance in emerging and currently circulating strains.

6. **Research**

NML will collaborate in research and development for monitoring influenza vaccine efficacy, immunological response, as well as evolution and determination of cross-reactivity among strains in the population.

NML, in cooperation with the Pandemic Vaccine Working Group of PIC, will develop protocols to test vaccine recipients for immune response. PHLs or designated laboratories in cooperation with NML may also develop and institute similar protocols, depending on available resources and expertise. Assays may include hemagglutination inhibition (HAI) and/or other tests using the antigens that are included in the most current vaccines.

B. **Pandemic Alert Period – Canadian Pandemic Phases 3.0, 3.1**

1. **Methodology**

During phase 3.0 diagnostic testing services capacity and approach will continue for seasonal influenza as in Phases 1.0, 1.1, 2.0 and 2.1. NML will be responsible for confirming any samples that test positive for novel influenza.

NML will provide the reagents and controls that will be essential in developing assays for newly emerging strains and that will establish quality assurance. NML will be responsible for phenotypic testing and distribution of information to PHLs. The genetic testing (i.e. identification by PCR) will be the responsibility of PHLs.

NML will give priority to reagent preparation for the identification of the new strain in readiness for Phase 3.1. It will distribute NAT and conventional culture protocols as appropriate.

During Phase 3.1, NML is responsible for confirming the results of any samples that test positive for novel influenza. It will also provide information regarding the novel influenza strain to the WHO and coordinate any further testing.

During Phase 3.1, PHLs and other diagnostic laboratories will be on high alert and will focus on the following:

- enhanced laboratory-based surveillance for the emerging new subtype
- implementation or augmentation of NAT protocols
- viral isolation by culture in appropriately equipped laboratories.

There will be an increased demand for testing with emphasis on the identification of the hemagglutinin (HA) type of the viruses identified. RT-PCR will be particularly useful for rapid detection and HA determination. Although viral isolation is encouraged to facilitate detection of the emergence of new subtypes within Canada, the number of laboratories that can perform culture in CL-3 is limited.

The use of commercially available rapid POC tests for the detection of a new subtype is not recommended because of the lack of information on their clinical accuracy. These tests may be able to rapidly identify and differentiate influenza A and B infections, but currently they do not differentiate different HA subtypes of influenza A and cannot differentiate human from avian influenza virus. Any findings from direct antigen or rapid POC tests obtained for patients suspected of being infected with a novel influenza virus must be confirmed by NAT and/or culture. If data become available outlining the efficacy of POC testing, PHLs will communicate these results to laboratories within their jurisdictions.

2. Specimen Type, Collection and Transport

An NPS is the optimal specimen for seasonal human influenza, but this may not be the case for novel influenza viruses, as has been recently reported for H5N1 infecting humans in Eurasia, where throat specimens are preferred. Because the optimal specimen type and timing of collection will not be fully known for novel influenza virus infections, particularly as they continue to evolve, PILPN recommends the collection of different types of respiratory specimens, including NP swabs, NP aspirate, nasal washings, throat swabs and sputa on multiple days. Consideration should be given to testing stool or plasma specimens in patients who have significant gastrointestinal symptoms, as H5N1 has been isolated in the stool and blood of infected patients.

Accurate diagnostic testing is vital, and confirmation of all findings of a novel subtype of influenza is essential. To facilitate this, specimens should ideally be collected in duplicate. If this is not possible or has not been done, the specimen should be divided into two aliquots before testing. One aliquot can then be used for NAT, and the other should be frozen at -70°C for future testing, if required.

Specimens should be shipped at 4°C to the PHL or designated laboratory as soon as possible. If there is going to be a delay of more than three days, the specimen should be frozen at -70°C and shipped on dry ice or else maintained at 4°C until processed. For more information, please see the WHO guidelines *Collecting, Preserving and Shipping Specimens for the Diagnosis of Avian Influenza A (H5N1) Virus Infection: Guide for Field Operations* (http://www.who.int/csr/resources/publications/surveillance/WHO_CDS_EPR_ARO_2006_1.pdf).

Ongoing training of personnel regarding proper shipment of specimens to reference laboratories and adequate knowledge of procedures and regulations is recommended.

3. Disinfection Procedures

Hypochlorite is considered by the WHO as the best disinfection for use against H5N1 contamination and would likely be applicable to other novel subtypes of influenza A. Hypochlorite is one of the few disinfectants that can safely be used in laboratories where NAT work is undertaken.

Other disinfectants, such as alcohols and quaternary ammonium preparations, can precipitate nucleic acids, which can increase the chance of contamination of subsequent reactions and lead to false-positive results. Chlorine bleach fragments nucleic acids. The WHO suggests two different concentrations to be used under different circumstances:

- Disinfection of specimen spills should be carried out using a 0.5% chlorine bleach.
- Disinfection of surfaces, medical equipment, contaminated waste before disposal and reusable protective clothing before laundering should be carried out using a 0.05% solution as per WHO

guidelines. As hypochlorite is caustic, it must be subsequently removed by wiping equipment or surfaces with clean water or 70% ethanol to prevent damage.

For more information on the preparation of and precautions to be taken with chlorine solutions, see the WHO's *Guide for Field Operations* (see the end of section 2).

4. Biosafety Considerations

The Office of Laboratory Security of the CEPR has drafted interim biosafety guidelines regarding the handling of clinical specimens associated with novel influenza virus subtypes. These guidelines can be found in appendix E. It is important to note that these are interim guidelines as information regarding any novel influenza strain becomes available the biosafety guidelines specific to that strain will be disseminated by CEPR in a timely fashion.

5. Antiviral Susceptibility

Isolates can be submitted to the NML for resistance testing to amantadine and neuraminidase inhibitors as agreed upon by NML in conjunction with PHLs. NML will undertake investigations related to surveillance for resistance in emerging and currently circulating strains.

Susceptibility testing of strains will be performed by NML and participating PHLs that have the protocols in place for neuraminidase inhibitors and/or amantadine, depending on the phenotypic characteristics of the pandemic strain. Specimens received by NML will be tested periodically throughout the pandemic as part of surveillance and to monitor the development of antiviral resistance.

In addition to routine surveillance testing, testing for antiviral resistance will be performed on specimens isolated from persistently infected patients (patients who are taking prophylaxis and/or are immunocompromised hosts) in outbreaks. Other testing will be done on specimens as determined by NML in collaboration with PHLs or any submitting diagnostic laboratory.

6. Research

If capacity exists, refer to Interpandemic Period Phase 1.0, 1.1, 2.0, 2.1.

C. Pandemic Alert Period – Canadian Pandemic Phases 4.0, 4.1, 4.2, 5.0, 5.1, 5.2

1. Methodology

During Phases 4.0 and 5.0, PHLs and other diagnostic laboratories will be on high alert and follow the protocol as in Phase 3.0 and 3.1:

- enhanced laboratory-based surveillance for the emerging new subtype
- NAT
- viral isolation by culture.

During Phases 4 and 5, a dramatic increase is expected in the demand for testing, especially in affected areas. NAT will be the primary method for rapid detection. Specimens positive for influenza A from patients with epidemiological features that suggest they are at risk of a novel

subtype of influenza will be subtyped using RT-PCR. Rapid subtyping of positive specimens will be performed by PHLs or designated laboratories.

NML, in consultation with the WHO, will review the primers used in NAT to ensure that they are effective in identifying the novel subtype. Additional supplies of appropriate cell lines may be required. NML, PHLs and designated diagnostic laboratories will share information and reagents for identification of the novel strain and will advise on cell lines, use of rapid test methodologies and the containment level required, etc.

Increased testing by culture in a certified CL-3 laboratory will be required to isolate the novel strain in suspected cases. Isolates or specimens from identified clusters will be forwarded to NML for strain characterization. PHLs and diagnostic laboratories will play a critical role in tracking the potential spread of the novel strain.

Once reference antisera are available, subtyping will be done using HAI and neutralization assays by laboratories with the appropriate containment facilities, as dictated by the containment level requirements of the novel strain. Other laboratories will rely on RT-PCR for rapid subtyping using previously established protocols.

All diagnostic laboratories will be under considerable pressure to provide rapid testing service from the standpoint of infection control and/or isolation as well as treatment and prophylactic options. The current national antiviral strategy is to provide treatment to all those presenting early for medical assessment who are deemed to require treatment, during the pandemic. However, there may be circumstances under which a more targeted approach to antiviral use may be required (e.g. if sporadic cases of novel influenza occur in Canada prior to a pandemic). Diagnostic laboratories will likely play a role, as the use of timely diagnostics may become an integral part of this strategy. PILPN will provide guidance to the Clinical Care Working Group on the utilization of testing, depending upon the available capacity.

2. Specimen Type, Collection and Transport

Refer to Pandemic Alert Phases 3.0, 3.1.

3. Disinfection Procedures

Refer to Pandemic Alert Phases 3.0, 3.1.

4. Biosafety Considerations

Refer to Pandemic Alert Phases 3.0, 3.1.

5. Antiviral Susceptibility

Refer to Pandemic Alert Phases 3.0, 3.1.

6. Research

If capacity exists, refer to Pandemic Alert Phases 3.0, 3.1.

D. Pandemic Period – Canadian Pandemic Phases 6.0, 6.1, 6.2

1. Methodology

Depending on the extent and duration of the pandemic, the demand for testing could reach an unprecedented level, which may overwhelm the diagnostic abilities of PHLs and other diagnostic laboratories. The laboratories will continue to function as in Phases 4 and 5 with a focus on the following:

- NAT
- reduction of emphasis on viral culture in areas where the pandemic is established
- reduction of testing once the novel subtype is present in the jurisdictional population.

NML will need to prioritize specimen testing in order to prevent overloading its capacity. Specimens routed through PHLs or designated laboratories will have priority.

NML, in collaboration with the WHO, will review the primers used in NAT to ensure that they are effective in identifying the pandemic strain. NML will provide PHLs with information or reagents for identification of the pandemic influenza virus and advice on cell lines.

PHLs will need to redirect resources to give priority to influenza testing. However, when the pandemic has become established, it is assumed that laboratories within the affected regions will scale down testing because clinical case definition may be sufficient for diagnosis in most cases. This will depend on local conditions and available resources. PHLs and designated diagnostic laboratories will focus on tracking the spread and trend of the pandemic and monitoring antiviral resistance, depending on available resources.

PHLs and local laboratories are encouraged to review influenza testing protocols, the availability of reagents and human resource (HR) issues, and to implement the pre-developed strategies to reduce the impact of the pandemic on laboratory testing. Laboratories should review inventory and order necessary supplies and cell lines, more viral transport swabs, influenza antigen tests, antisera for DFA testing and laboratory personnel protective items, etc., as necessary.

Rapid subtyping of isolates will be done by PHLs or designated laboratories with back-up support from NML, which will use culture and NAT-based methods.

2. Specimen Type, Collection and Transport

Refer to Pandemic Alert Phases 3.0, 3.1.

3. Disinfection Procedures

Refer to Pandemic Alert Phases 3.0, 3.1.

4. Biosafety Considerations

Refer to Pandemic Alert Phases 3.0, 3.1.

As the pandemic progresses, PILPN will provide guidelines on testing and updates on antiviral susceptibility of the pandemic strain and other co-circulating strains.

5. Antiviral Susceptibility

Refer to Pandemic Alert Phases 3.0, 3.1.

6. Research

If capacity exists, refer to Pandemic Alert Phases 3.0, 3.1.

E. Postpandemic Period

This will mark a return to interpandemic activities. Any testing issues that arose during the pandemic will be reviewed to determine whether there are changes to the pandemic plan that could be implemented.

V. Surveillance and Data Collection

Laboratory surveillance, in combination with epidemiological data, will be critical during a pandemic to determine the phases that are in effect and thus trigger the necessary responses.

A. Interpandemic Period – Canadian Pandemic Phases 1.0, 1.1, 2.0, 2.1

As part of yearly ongoing surveillance, PHLs or designated laboratories must submit influenza isolates** to NML for subtyping and characterization, as noted in Table 1. These isolates must be submitted to NML promptly, along with the results of any subtyping or genotyping performed locally. NML will give priority to processing such specimens. Virus will be amplified in cell culture for subtyping by HAI and/or neutralization assays. For specimens that cannot be amplified by culture, the genotype will be determined after amplification of selected genes by RT-PCR and sequencing. NML will undertake to report the subtype to the submitting laboratory within a few days of receipt.

Table 1 The types of isolates to be submitted by PHLs or designated laboratories to NML for subtyping and characterization as part of the ongoing surveillance program	
Isolate Type	
	10% of all influenza isolates, including at least five early season, five late season.
	Any isolate obtained outside of the influenza season, including isolates from a person presenting with SRI and an epidemiological link to an area of concern.
	Isolates that cannot be subtyped by HAI or other methods.
	Isolates from persons whose influenza illness is related to international travel.
	Isolates from persons receiving antiviral agents or from their contacts who become ill.
	Isolates from cases of suspected animal-to-human transmission or any unusual isolates.

Phase 2.1 is defined as the period when “an animal influenza virus subtype that poses substantial risk to humans is circulating in animals in Canada”. During this phase laboratories will be testing isolates from cases of suspected animal-to-human transmission or any unusual isolates. Laboratory surveillance data processed during this phase will be used to determine whether the pandemic has moved into phase 3.1.

NML and selected PHLs will share subtyping and susceptibility testing technology as well as the development of rapid test(s) for detection of influenza, and better subtyping and susceptibility testing methods. They will also serve as sites for training personnel from other appropriate laboratories in these methods.

** If isolates cannot be obtained, clinical specimens or extracted RNA may be submitted.

B. Pandemic Alert Period – Canadian Pandemic Phases 3.0, 3.1

In addition to subtyping and characterization of isolates as part of routine surveillance activities (Table 1), all influenza A positive specimens obtained from persons with epidemiological risk factors for a novel subtype of influenza A virus must be subtyped and, if they are not, must be forwarded for further testing to NML. PHLs will play a critical role in tracking the potential spread of the novel strain. Any positive influenza specimens obtained from a case with SRI and epidemiological links with a novel influenza virus subtype need to be confirmed by NML and rapidly characterized.

Appendix F outlines the communication flow between provincial and federal agencies in the event of a suspected novel influenza virus.

C. Pandemic Alert Period – Canadian Pandemic Phases 4.0, 4.1, 4.2, 5.0, 5.1, 5.2

Refer to Phases 3.0 and 3.1. Heightened laboratory-based surveillance will continue:

- monitoring genetic drift of the influenza virus
- monitoring the emergence of new and co-circulating subtypes.

D. Pandemic Period – Canadian Pandemic Phases 6.0, 6.1, 6.2

Enhanced surveillance will continue until the pandemic subtype is established in each laboratory's respective jurisdiction.

E. Postpandemic Period

This will mark a return to interpandemic activities. Any surveillance issues that arose during the pandemic will be reviewed to determine whether there are changes to the pandemic plan that could be implemented.

During this period there will be a sustained increase in the volume of testing. Clinicians will require testing on samples from patients with influenza-like illness in order to identify the viruses present and rule out the continued circulation of the pandemic strain.

During the postpandemic period the laboratory experience should be reviewed at all levels to determine whether modifications to standard operating procedures or diagnostic methods are required to prepare for a potential subsequent wave.

VI. Communication Activities

A. Interpandemic/Pandemic Alert Period – Canadian Pandemic Phases 1.0-5.2

Each PHL will maintain an up-to-date list of laboratories that routinely test for influenza in their jurisdictions. Information from each laboratory, including a contact name, fax and telephone numbers, and e-mail address, should be maintained in a database so that current information regarding novel viral isolates and their diagnostic characteristics can be rapidly disseminated and made accessible to influenza testing facilities.

An up-to-date listing of all influenza testing laboratories will also be maintained by NML and the CPHLN secretariat. The information will also be accessible to all PIPLN and CPHLN members on their respective secure Web sites.

The CPHLN secretariat must set up enhanced communications to link NML, PHLs and other diagnostic laboratories that test for influenza with provincial epidemiologists. This can be done using the Canadian Laboratory Surveillance Network (CLSN) intelligence exchange centre, enabling e-mail, fax, telephone and/or teleconference, and Web-casting communication capabilities for infectious disease outbreak and event management. CPHLN and NML have each established toll-free numbers to enable dedicated contact with their respective leads in the event of an emergency. CPHLN and NML will disseminate these numbers to the appropriate public health authorities at the beginning of an emergency.

Diagnostic expertise from PIPLN will be solicited by CPHLN as deemed necessary and appropriate.

NML and PHLs will share sequence information of novel strains as soon as it is available and exchange details of recommended protocols and primers where appropriate.

Information such as subtype, optimal cell lines to use, usefulness of direct antigen testing, antiviral susceptibility, morbidity and mortality from WHO, the Centers for Disease Control and Prevention, NML or laboratories from areas affected by the new subtype will be rapidly disseminated to PHLs by CPHLN secretariat through various means, e.g. CLSN intelligence exchange centres, fax, e-mail, telephone, depending on the circumstances.

Using the laboratory database compiled as part of preparedness activities, PHLs will ensure that other influenza testing laboratories in their province are kept informed. The CPHLN secretariat will coordinate meetings and/or teleconferences of PIPLN and PHLs as required.

B. Pandemic Period – Canadian Pandemic Phases 6.0, 6.1, 6.2

Extensive communication within the PIPLN will continue, and this will include such means as telephone, fax, e-mail and Canadian Network for Public Health Intelligence (CNPHI) collaboration centres as required.

NML will be responsible for rapid communication of relevant information concerning the evolution of the pandemic to PHLs and other diagnostic laboratories. This will include information concerning the occurrence of small or large clusters in different locations communicated through CPHLN and CLSN intelligence exchange centres, or by fax, e-mail

or telephone as appropriate, and the provision of updates on the activity of pandemic strain, cell lines, direct test methods, etc. The PHLs will then be responsible for forwarding information to their respective Chief Medical Officers of Health or the Council of Chief Medical Officers of Health.

PHLs will rapidly communicate through NML their first isolates of the pandemic strain as well as any other local influenza activity (Appendix F).

Communication between PHLs and other influenza testing laboratories within the jurisdiction will continue.

Communications outlining any changes to testing during the pandemic will be released to clients. Alternative strategies available to help reduce the workload of the laboratory may be included.

As the pandemic progresses, NML will keep PHLs informed of influenza activity across the country, changes in susceptibility, and other circulating strains.

PHAC will provide information regarding morbidity and mortality.

Laboratories are encouraged to provide updated educational sessions for staff regarding testing, safety and HR issues, and to prepare communications to physicians regarding reductions in service and indications for limited testing during the pandemic.

C. Postpandemic Period

This will mark a return to interpandemic activities. Any communication issues that arose during the pandemic will be reviewed to determine whether there are changes to the pandemic plan that could be implemented.

VII. Pandemic Preparedness

A. Planning Assumptions

Planning assumptions are essential in establishing laboratory protocols and procedures, and stockpiling materials and supplies that will be necessary during the pandemic. The assumptions outlined in this annex will help laboratories develop appropriate business continuity plans.

- The pandemic strain will emerge in Canada within three months after it emerges in another part of the world.
- Canada will receive advance warning of the human-to-human spread of disease from other affected geographic areas, and laboratories will use advance notice to finalize details relating to diagnostics, primer sequences, etc.
- Timely and accurate laboratory surveillance and diagnostics in the Pandemic Alert Period will be critical to appropriate clinical and public health management.
- As the pandemic evolves from phase 4 to phase 6, there will be at least a 10 fold increase in the demand for influenza diagnostic testing.
 - On the basis of approximately 27,000 influenza tests performed nationally during an eight-week peak of normal influenza activity (*Respiratory Virus Detections/Isolations in Canada*: http://www.phac-aspc.gc.ca/im/influenza_e.html), it is expected that 270,000 requests for testing will be processed by sentinel laboratories alone. This may be an underestimate since the number is based only on sentinel laboratories reporting to PHAC's Respiratory Virus Detection/Isolation Program.
- In phase 6 of the pandemic, laboratory confirmation of clinical influenza diagnoses will likely decrease as the morbidity peaks and a reasonably accurate clinical diagnostic algorithm becomes available.
- In the CPIP it is estimated that over the course of the pandemic, 15%-35% of the population will become clinically ill such that they will be unable to attend work or other activities for at least half a day. Estimated absentee rates of laboratory personnel will correspond to this range.
- It is anticipated that a vaccine will become available four to six months after WHO declares Phase 6.0.
- Antivirals for early treatment of cases will be available throughout Canada. Implementation of this strategy may affect the prioritization of laboratory diagnostics.
- Antiviral resistance will be monitored as part of the antiviral strategy.
- Laboratories will see an increase in testing requests for secondary infections resulting from influenza and an increase in nosocomial testing due to increased numbers of hospital admissions. The extent of these increases is unknown and will depend on the population groups most affected by the pandemic strain.

- There will be shortages of the materials and supplies needed during the pandemic period. Therefore, plans are required to allow for a consistent 16-week supply (i.e. two pandemic waves) of both influenza and non-influenza related materials to address sporadic interruptions of supply chains (e.g. resulting from mail and courier disruptions, border closures, supply limitations).

B. Business Continuity Considerations

As part of pandemic preparation, PILPN recommends that PHLs and other local laboratories assess how the pandemic will affect other clinical laboratory functions and HR issues. Although the true impact is difficult to accurately predict, certain test requests from physicians will increase (e.g. increased respiratory specimens), and others will decrease. Trying to anticipate this in advance may help in developing strategies to maximize workflow and efficiency.

Strategies may include but are not limited to the following:

Assessing Laboratory Functions

- Develop a list of essential laboratory services.
- Anticipate testing demands that will increase (both influenza diagnostic and non-influenza diagnostic tests) and those that may decrease.
- Consider the appropriate means of streamlining specimen accessioning.
- Develop a prioritization strategy for lowering routine workload and other services to determine which services will be restricted and in what order when there are HR and other resource problems. This will need to include the impact of each test and its volume.
- Consider possible changes in the testing schedule to maximize workflow and efficiency.
- Confirm and provide assurance that enough supplies are available to maintain the ability to diagnose influenza and that these supplies will last at least throughout the first wave of the pandemic.
- Increase inventory of swabs, viral transport media kits and other reagents needed for influenza diagnostics.
- Review inventory and order necessary supplies, cell lines (e.g. more viral transport swabs and/or media, NAT reagents and antisera for DFA testing) and personal protective equipment.
- Review testing algorithms for influenza based upon availability of reagents, cell lines and kits, and modify if necessary.
- Review the other non-influenza related tests for which the demand is likely to increase (e.g. blood culture, sputum culture) in addition to influenza-related diagnostics.

PHLs and other viral diagnostic laboratories should also review strategies developed to reduce the impact on clinical laboratories:

- Review the testing prioritization list.
- Review alternative testing strategies and ensure that the supply of reagents is available for testing
 - e.g. urine dip sticks for screening urine samples
 - e.g. urine dipsticks for general practitioners, to encourage in-office testing.
- Prepare any reagents that will be needed for the next several months, e.g. media.
- Begin prioritization exercise.
- Implement specimen deferral, rejection and test minimization strategies.
- Readjust testing schedules as appropriate.
- If capable, act as suppliers or provide seed stocks/protocols for the propagation of cells (e.g. Madin-Darby canine kidney) to other laboratories in need.

Assessing Human Resource Requirements

- Develop an inventory of currently provided services and the HR required to maintain this level of service.
- Develop a list of the HR requirements to maintain essential services.
- Develop a staffing strategy. Ideally staffing issues should be considered before the pandemic so that potential concerns can be addressed before HR problems develop.
- Encourage laboratory staff to be vaccinated against annual seasonal influenza.

Strengthening Laboratory Capacity

Laboratory capacity must be strengthened to establish optimal levels of laboratory preparedness during a pandemic. At best, according to current operational levels, most laboratories will only be able to double their testing capacity over the anticipated first wave of the pandemic. To meet the projected 10 fold increase in testing over this period, PILPN strongly recommends that influenza testing laboratories increase stockpiled supplies; obtain additional equipment capacity; and increase available trained technical staff:

- Stockpiled supplies must include perishable and non-perishable items that will be in short supply in a pandemic. Although laboratories will strive to use stockpiled perishable supplies before their expiry date, it is unavoidable that a substantial amount of wastage will occur until a pandemic arrives. Careful stock rotation must be implemented to mitigate potential losses.
- Influenza testing laboratories will also require additional nucleic acid extraction and amplification equipment. To ensure that competence in the use of the equipment is maintained, this additional equipment may be used for other routine laboratory testing.
- Laboratory technical staff must be cross-trained to perform NAT for influenza and subsequent subtyping. The increase in trained staff will address additional testing requests and projected absenteeism losses during a pandemic. Trained staff must maintain competence by working on NAT for both seasonal influenza and other viruses.

Participating in Preparedness Exercises

Laboratories should plan to participate in pandemic exercises at the request of the PHAC to test plans and identify areas that need further attention. Assessment of this exercise process will be required by all participants.

Establishing Memoranda of Agreement

Agreements will need to be established both intra- and inter-provincially to outline how PHLs would best redirect testing capacity to help track the spread of the pandemic and to standardize how laboratories will triage critical and non-critical respiratory testing. This will be necessary so that at least some capacity will be available to track the onset and escalation of pandemic activity in Canada.

C. Quality Assurance and Quality Control

Participation in NML proficiency programs for influenza is strongly recommended for all laboratories performing any type of influenza diagnosis. NML will provide proficiency panels to assess the diagnostic sensitivity and specificity of tests available at PHLs and other viral diagnostic laboratories. NML and PHLs will share reagent lots designed to diagnose circulating or emerging influenza subtypes. NML will also provide one influenza proficiency panel per year to any Canadian laboratories that wish to participate in NAT identification of current influenza A strains. This will consist of RNA extracts from key strains of interest for RT-PCR quality control testing.

PILPN recommends participation in other accredited proficiency programs, such as those of the College of American Pathologists.

During the later stages of the Pandemic Alert Period (4.1, 4.2, 5.0, 5.1, 5.2), diagnostic capabilities of laboratories will be strained; however, it will be important to continue quality assurance activities, such as the participation in proficiency panels distributed by NML. NML will be responsible for providing the guidance and materials required.

During the pandemic period, laboratories are encouraged to ensure that the new methods are sensitive and specific through participation in ongoing quality assurance programs. Problems encountered should be reported to NML for investigation and/or sharing of information with PHLs and other diagnostic laboratories.

VIII. Appendices

Appendix A - Acronyms

Organizations

Canadian Laboratory Surveillance Network . . . . .	.CLSN
Canadian Network for Public Health Intelligence . . . . .	.CNPHI
Canadian Public Health Laboratory Network . . . . .	.CPHLN
Centers for Disease Control and Prevention (United States) . . . . .	.CDC
Centre for Emergency Preparedness and Response . . . . .	.CEPR
Centre for Immunization and Respiratory Infectious Diseases . . . . .	.CIRID
Federal, provincial and/or territorial . . . . .	.FPT
National Microbiology Laboratory . . . . .	.NML
Pandemic Influenza Committee . . . . .	.PIC
Pandemic Influenza Laboratory Preparedness Network . . . . .	.PILPN
Province and/or territory . . . . .	.P/T
Public Health Agency of Canada . . . . .	.PHAC
Public health laboratories . . . . .	.PHLs
World Health Organization . . . . .	.WHO

Diagnostic and Scientific Terms

Containment level . . . . .	.CL
Direct fluorescent antibody assay . . . . .	.DFA
Enzyme immunoassay . . . . .	.EIA
Hemagglutinin . . . . .	.HA
Hemagglutination inhibition . . . . .	.HAI
Human resource(s) . . . . .	.HR
Immunofluorescent assay . . . . .	.IFA
Nasopharyngeal . . . . .	.NP
Nasopharyngeal swab . . . . .	.NPS
Nucleic acid amplification test . . . . .	.NAT
Point of care . . . . .	.POC
Polymerase chain reaction . . . . .	.PCR
Reverse transcriptase polymerase chain reaction . . . . .	.RT-PCR
Ribonucleic acid . . . . .	.RNA
Severe Respiratory Illness . . . . .	.SRI

Appendix B – Minimum Requirements for the Provision of Public Health Laboratory Services During Pandemic Influenza

PILPN recommendation of minimum requirements for the provision of public health laboratory services during pandemic influenza

- Preamble
- Testing Procedures/Capacity
- Specimen Collection
- Business Continuity Plan
- Communication
- PHLs Required to Meet Minimum Requirements

Preamble

The Assumptions about Demands for Testing

- The peak demand for testing services, the duration of that peak period, the availability of testing supplies and reagents, as well as human resources, cannot be accurately predicted.
- The following recommendations are based on PILPN's best estimates and assumptions.

Testing Procedures/Capacity

- Provincial public health laboratories (PPHLs) or a designated laboratory must be able to diagnose influenza A by nucleic acid amplification tests (NAT). These methods must be broadly reactive to be able to identify novel subtypes of influenza A.
- Each PPHL or designated laboratory must be able to subtype positive influenza A specimens to distinguish seasonal influenza from novel subtypes.
- Each PPHL that has Containment Level 3 (CL3) capabilities must develop standard operational procedures for the culture and identification of novel subtypes of influenza A. PPHL or the designated laboratories that do not have this capability should develop a Memorandum of Understanding with another designated laboratory with CL3 capability or the National Microbiology Laboratory (NML) to provide this service.
- Provincial and other designated laboratories must have the capacity to meet the increased demands for testing for pandemic influenza.
- The NML has the mandate to provide additional, more specialized, testing, including serological, antiviral resistance testing and antigenic characterization. However, PHLs,

depending on their resources and expertise, may collaborate with NML to develop these tests in order to provide additional surge capacity for specialized testing.

Specimen Collection

Each PPHL or designate must be able to provide or advise on the appropriate specimen collection devices.

- At present, the ideal specimen for a novel subtype is not known, so these laboratories must recommend collection of nasopharyngeal swabs, throat swabs, nasal swabs and, potentially, plasma and stool from individuals with epidemiological features that put them at risk of a novel subtype of influenza A.
- As the pandemic progresses, information regarding the most appropriate specimen(s) will be provided.

Business Continuity Plan

- Each PPHL or designate must develop a business continuity plan for influenza-related diagnostics and other essential non-influenza testing services, to include the following:
 1. Determination of the minimum requirements for human resources and materials in order to maintain uninterrupted, essential services during the critical phase of the pandemic. While the initial pandemic wave may last for at least eight weeks (to vary by jurisdiction), laboratories must address limitations in such items as supplies, reagents and human resources. Planning must include provision of supplies and reagents for Phase 4, 5 and 6. Planning should include the Public Health Agency of Canada (PHAC) Mutual Aid Agreement.
 2. Development and publication of a prioritized list of laboratory services that will be reduced as needed during a pandemic.
 3. Development of stockpiles of reagents and supplies necessary to maintain these essential services and implementation of an inventory management system to maximize utilization of reagents and minimize loss due to reagent expiration. This must take into account the limited shelf life of essential perishable items.

Communication

Minimum Requirements for Timely Communication

- Each PPHL or designated laboratory should develop or enhance communication links with its local provincial public health departments and CPHLN. Information regarding novel subtypes will be updated from the Canadian Pandemic Influenza Committee through PILPN and then through CPHLN. (See Figure A: PILPN and Information Flow: Bridging Local and Provincial Public Health Laboratories via CPHLN and the Canadian Pandemic Influenza Committee.)
- Constant and timely updating of laboratory epidemiological information (data, specimen collection and routing, biosafety, etc.) during a pandemic needs to be developed further.
- PPHLs and designated laboratories will take a lead role in developing and guiding specimen triage mechanisms (e.g. an essential clinical information form) (see Figure B).

PHLs Required to Meet Minimum Requirements

Newfoundland/Labrador

Newfoundland Public Health Laboratory*
100 Forest Rd
PO Box 8800
St. Johns, NL A1A 3Z9
Phone: (709) 777-6565
Fax: (709) 777-7070

Nova Scotia

QE II Health Science Centre
5788 University Ave.
Halifax, NS B3H 1V8
Phone: (902) 473-6885
Fax: (902) 473-4432

New Brunswick

L'Hôpital régional
Dr. G.L. Dumont
330 avenue Université
Moncton, NB E1C 2Z3
Phone: (506) 862-4820
Fax: (506) 862-4827

Québec

Laboratoire de santé publique du Québec*
20045, chemin Sainte-Marie
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Phone: (514) 457-2070
Fax: (514) 457-6346

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Central Public Health Laboratory*
81 Resources Rd.
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Fax: (416) 235-5941

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Phone: (204) 945-6456
Fax: (204) 786-4770

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Fax: (306) 787-1525

Alberta

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Fax: (780) 407-8984

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Phone: (403) 670-1200
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British Columbia Centre for Disease Control,
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* Indicates that the facility has Containment Level 3 certification.

Figure A: PILPN and Information Flow: Bridging Local and Provincial Public Health Laboratories via CPHLN and the Pandemic Influenza Committee

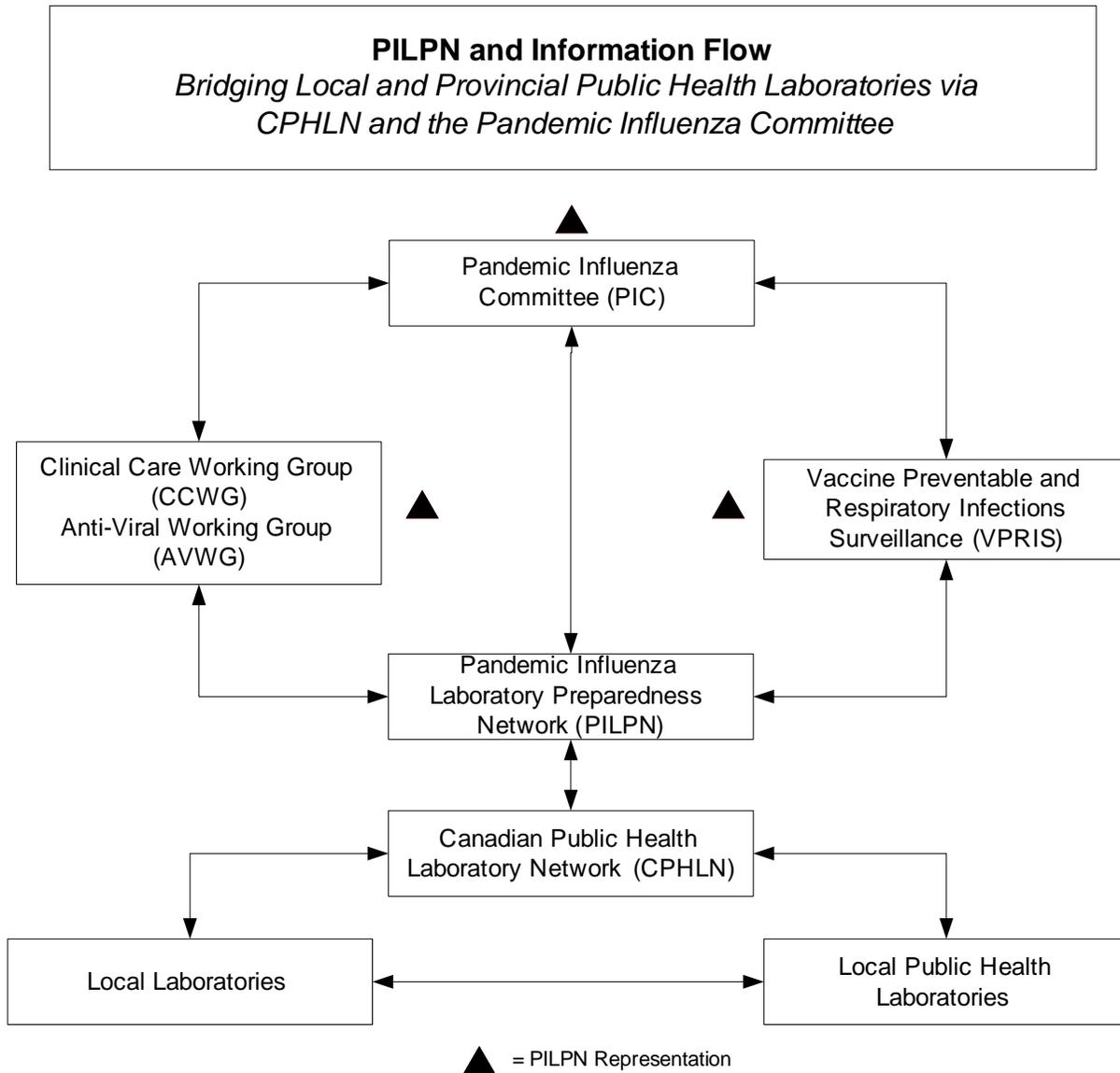


Figure B Severe Respiratory Illness and Pandemic Influenza Laboratory Sheet

SEVERE RESPIRATORY ILLNESS AND PANDEMIC INFLUENZA LAB SHEET
PRINT CLEARLY IN CAPITAL LETTERS. FILL IN CIRCLES ● / ○

Health Card Number Province/Territory

Surname

First Name

Date of Birth / / yyyy/mm/dd

Address

Postal Code Telephone () -

Physician Name

Physician Fax () -

Institution Name

Date of Collection / / yyyy/mm/dd

Specimen Type Nasal Nasopharyngeal Throat Sputum Tracheal/BAL
 Other (Specify)

Specimen Bar Code

MOH Authorization Yes No Unit Outbreak Number

Symptoms Asymptomatic Fever Pharyngitis Cough
 Diarrhea Pneumonia Encephalitis
 Other (Specify)

Days of Fever Days of Respiratory Symptoms

Site Home Clinic Emergency Depart Inpatient-ward Inpatient ICU Died

Epidemiologic Information Travel to endemic area (Specify)

Human Contact Proven/suspected Hospitalized Fatal
 Animal Contact
 Prophylaxis Oseltamivir (Tamiflu) (Days)
 Treatment Oseltamivir (Tamiflu) (Days)
 Zanamivir (Relenza) (Days)
 Other

Response Yes Partial No

Appendix C – Province of Québec’s Preparation for an Influenza Pandemic – Rapid Tests: Value and Limitations²

Excerpt from:

Fauvel, Micheline, Couillard, Michel. October 2006. “Préparation à une pandémie de grippe. Lignes directrices à l’intention des cliniciens et des laboratoires du québec sur l’utilisation des épreuves de laboratoire pour les virus influenza.” Institut national de santé publique du Québec.

Sensitivity and Specificity of Two Rapid Tests Approved in the United States

The WHO, the Centers for Disease Control and Prevention (CDC) and the U.S. Food and Drug Administration (FDA) have issued warnings and recommendations on the use of rapid tests for the detection of influenza A according to the suspected presence of the avian flu. Summarized in this section, these documents can be consulted on the following sites:¹⁻³

- <http://www.cdc.gov/flu/professionals/labdiagnosis.htm>
- http://www.who.int/csr/disease/avian_influenza/guidelines/rapid_testing/en/index.html
- <http://www.fda.gov/cdrh/oivd/tips/rapidflu.html>

Several tests for the rapid detection of influenza have been approved in Canada; these can detect the following:

- influenza A and B without viral typing;
- influenza A only;
- influenza A and B with viral typing.

They do not currently distinguish between influenza A subtypes H and N.

The rapid tests have been evaluated with different types of specimens and different populations. They have high sensitivities in pediatric populations, since children excrete more of the virus and for a longer period of time than do adults. The table below presents the data generated with two rapid tests.³ Specificity may also vary according to the age of the population and specimen type.

Sensitivity and Specificity Compiled from Two Rapid Tests*				
Specimen	Type of Influenza Virus Detected	Population**	Sensitivity, %†	Specificity, %†
Throat swab	A	Pediatric‡	65-90	81-91
		Adult	24-91	69-94
Throat swab	A and B	Not specified	59-82	81-93
Nasopharyngeal lavage or aspiration	A	Pediatric‡	82-95	98-100
		Adult	53-87	90-100
Nasal lavage	A	Pediatric‡	36-88	92-99
		Adult	9-99	59-100
Nasal lavage or aspiration	A	Not specified	65-84	95-99
Nasal swab	A and B	Not specified	65-87	87-97

* Adapted from FDA. *Cautions in Using Rapid Tests for Detecting Influenza A Viruses*. November 14, 2005, available at: <http://www.fda.gov/cdrh/oivd/tips/rapidflu.html>. Kits and manufacturers not identified.

** Data from the U.S., Australia or New Zealand during seasons in which the predominant influenza strains were A H3 and A H1.

† 95% confidence intervals.

‡ Age not specified but mainly under 10 years old.

Implications

Rapid tests have lower sensitivities than culture or RT-PCR, while their specificities are rather high. Rapid tests can also produce false-positive or false-negative results, at a rate that varies according to the level of influenza activity in the population. In fact, it is the infection's prevalence that influences the positive or negative predictive values. The table below presents an example of the variation in predictive values when the same kit is used at the start and at the peak of influenza activity for simulated prevalence rates of 1% and 25%.

Predictive Values by Prevalence		
	Prevalence of Influenza	
	1,000/100,000 (1%)	25,000/100,000 (25%)
Individuals infected	1,000	25,000
Individuals not infected	99,000	75,000
Kit sensitivity	80%	80%
Kit specificity	97%	97%
True positives	800	20,000
False positives	2,970	2,250
True negatives	96,030	72,750
False negatives	200	5,000
PPV	21.2%	89.8%
NPV	99.8%	93.6%

PPV, positive predictive value; NPV, negative predictive value

In the off-season or at the very beginning of an active period, negative predictive values (NPVs) are higher and positive predictive values (PPVs) lower, thereby making false-positive results more likely. For this reason, it is important to confirm the first positive results generated with a rapid antigen detection kit. During the high-activity season, the PPVs will be higher, generating few false positives, whereas the NPVs will be lower.

Currently, preliminary information on the use of rapid tests in Asia suggests that their sensitivity is low in cases in which influenza A H5N1 infection has been confirmed by culture. Data on the amplitude of avian virus excretion by infected humans are currently limited. The best clinical specimen for optimal detection of the H5N1 strain in humans is still unknown. Therefore, the sampling of various respiratory specimens, including those of the lower respiratory tract, is encouraged in suspected cases of avian flu.²

Limitations of rapid tests

When interpreting results obtained with rapid tests, it is important to consider the laboratory and surveillance data on the circulation of strains and the level of influenza activity. The following points should be considered:

- When activity is low, positive results from a rapid test should be confirmed by culture or by RT-PCR.
- During peak activity periods, when the NPVs are slightly lower, false negatives are more likely.
- At the start of the influenza season, negative results should be interpreted with caution, and confirmation by culture or PCR should be considered, since a negative result does not necessarily rule out an influenza infection.
- Rapid tests do not provide information on viral subtypes and are unable to distinguish influenza A strains infecting humans (H1, H2, H3) from those infecting birds or other animals (H5, H7, H9).

Therefore, it is important that sufficient specimens be collected to enable additional confirmation tests, according to activity periods and when new strains are suspected.

Finally, when commercial kits are evaluated, it is recommended that the published data be analyzed with the following cautions:

- The comparison of sensitivities and specificities of commercial kits published in their manufacturers' monographs should be interpreted with caution, since their studies are conducted with different groups of patients whose variable specimens are collected at different times after the onset of symptoms.
- Performing a test using samples that were frozen can sometimes result in a higher sensitivity than using fresh samples.
- Inappropriate collection, storage and shipment of specimens can generate false-negative results.
- The tests' predictive values will depend on the level of influenza activity in the community.

The list of rapid influenza antigen detection kits currently approved in Canada is shown in the table below. To obtain an updated list of approved medical devices used for detection, send an e-mail request to: device_licensing@hc-sc.gc.ca or call 613-957-1909.

Name of the Kit	Manufacturer	Approval No.
BD DIRECTIGEN EZ FLU A+B	Becton Dickinson and Company	66969
DIRECTIGEN FLU A TEST KIT	Becton Dickinson and Company	10819
DIRECTIGEN FLU A + B	Becton Dickinson and Company	23834
BINAX NOW INFLUENZA A & B	Binax Inc.	71036
FLU OIA TEST KIT	Thermo Biostar Inc.	23519
ACTIM INFLUENZA A & B TEST	Medix Biochemica OY AB	66656
QUICK S INFLU A/B TEST	Innovatek Medical Inc.	66848
IMMUNOCARD STAT FLU A & B	Meridian Bioscience Inc.	65947
QUICKVUE INFLUENZA A+B TEST	Quidel Corporation	20158
NOW FLU A NOW FLU B TEST KIT	Binax Inc.	61340
XPECT FLU A/B	Remel	63374
CLEARVIEW FLU A/B TEST	Wampole Laboratories Inc.	66506
INFLU A RESPI STRIP	Coris Bioconcept	63448
INFLU A&B TEST KITS	Coris Bioconcept	69985

Note: Data from June 2006. Source: Medical Devices Bureau, Health Canada.

References

1. World Health Organization. *WHO recommendations on the use of rapid testing for influenza diagnosis*. July 2005. Available at: http://www.who.int/csr/disease/avian_influenza/guidelines/rapid_testing/en/index.html.
2. US Food and Drug Administration. *Cautions in using rapid tests for detecting influenza A viruses*. November 14, 2005. Available at: <http://www.fda.gov/cdrh/oivd/tips/rapidflu.html>.
3. US Food and Drug Administration. *Guidance for industry and FDA staff. In vitro diagnostic devices to detect influenza A viruses: labeling and regulatory path*. April 2006. Available at: www.fda.gov/OHRMS/DOCKETS/98fr/06d-0121-gdl0001.pdf.

Appendix D – Nasopharyngeal Swab Procedure

Nasopharyngeal swab procedure

1. Use the swab supplied with the viral transport media.
2. Explain the procedure to the patient.
3. When collecting the specimens, wear eye protection, 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 (e.g. Q-Tip).
5. How to 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 **approximately 2/3 of 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.)

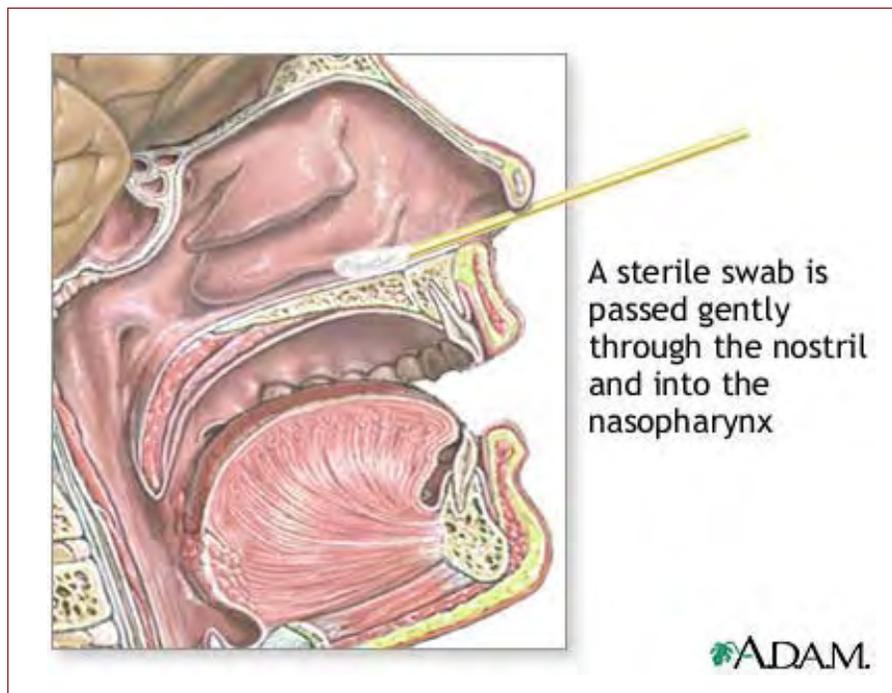


Image obtained from <http://www.nlm.nih.gov/medlineplus/ency/imagepages/9687.htm>

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 to the laboratory.

Appendix E – Draft Pandemic Influenza Laboratory Advisory

Office of Laboratory Security, Centre for Emergency Preparedness
and Response, Public Health Agency of Canada

As part of the emergency preparedness plan, the Office of Laboratory Security is providing the following draft biosafety advisory regarding the laboratory handling of clinical specimens associated with new influenza virus subtypes that may pose a pandemic threat. Please note that the recommendations below are subject to change as specific information on the pandemic strain becomes available, and changes will be disseminated by CEPR in a timely fashion.

Precautions for laboratories receiving and processing human clinical specimens and tissue samples from suspected human cases of pandemic influenza:

- Specimens may be processed for packaging and distribution to diagnostic laboratories for further testing in a Containment Level 2 laboratory¹ using the additional operational practices as outlined below.
- Diagnostic testing (excluding viral culture) to rule out pandemic influenza virus strains may be performed in a Containment Level 2 laboratory¹ using the additional operational practices as outlined below.
- Viral culture should be performed in a certified CL3 laboratory.

Additional operational practices:

- Laboratory workers should wear protective clothing (e.g. protective solid-front gowns, gloves and NB95 respiratory protection) in accordance with the risk of exposure when handling specimens.
- Manipulations are to be carried out in a certified biological safety cabinet.
- Centrifugation of clinical specimens and tissue samples should be carried out using sealed centrifuge cups or rotors, both of which are unloaded in a biological safety cabinet.

Precautions for laboratories handling human clinical specimens from confirmed cases of pandemic influenza for isolation and further manipulation of the agent:

- Specimens may be processed for packaging and distribution to laboratories for further testing in a Containment Level 2 laboratory¹ using the additional operational practices as outlined above.
- Manipulation of the agent should be in a Containment Level 3 laboratory¹ using Containment Level 3 operational practices.¹
- PCR testing of extracted, non-infectious genetic material may be performed in a Containment Level 2 laboratory.¹

For information on biosafety precautions for activities involving pandemic influenza virus strains *in vivo* and handling of animal specimens, contact the Biohazard Containment and Safety Division at the Canadian Food Inspection Agency, (613) 221-7088.

Transportation of clinical specimens:

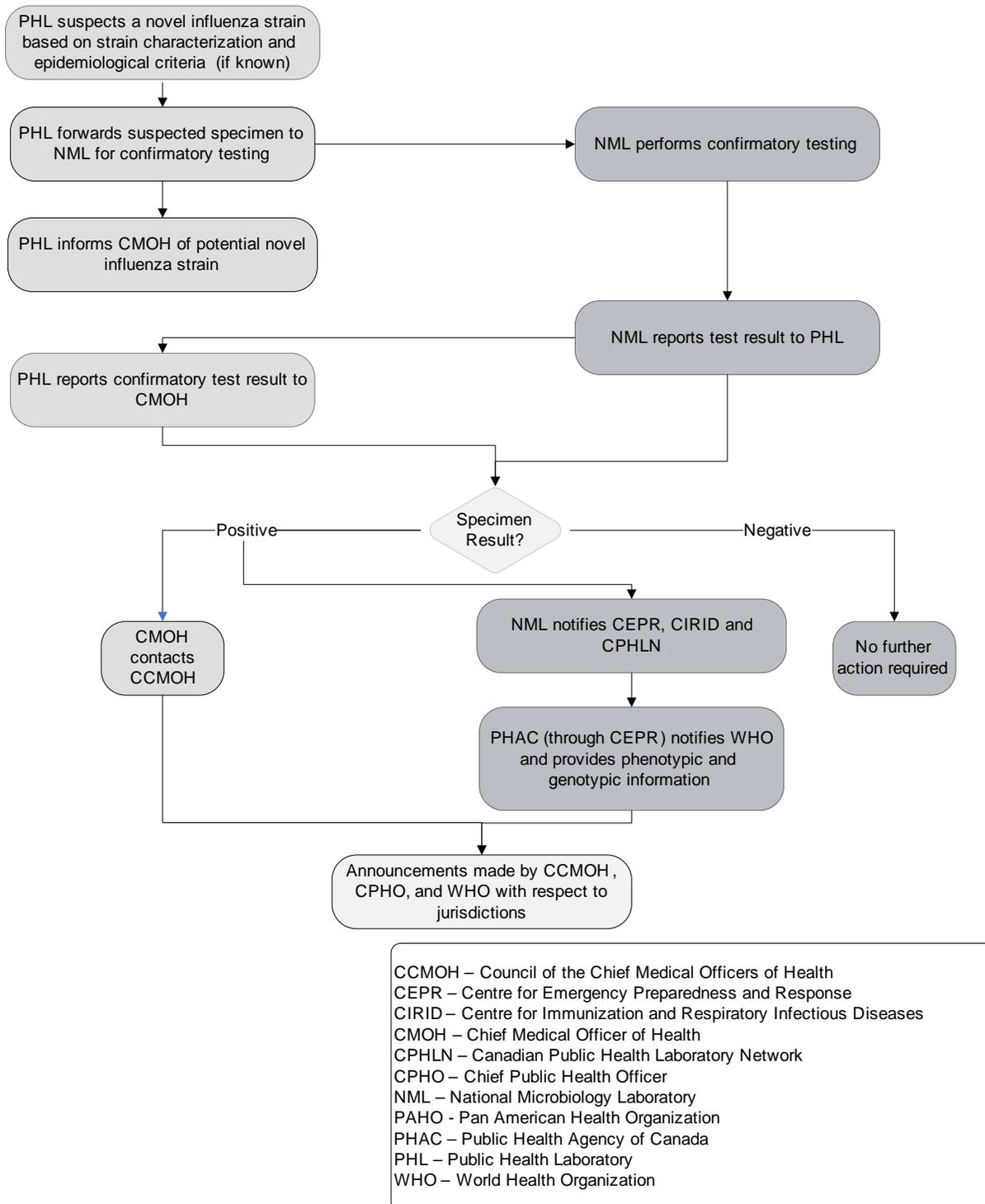
- Packaging, shipping and transport of specimens must, as a minimum, comply with the requirements of the *Transportation of Dangerous Goods Regulations*, Transport Canada² and the *Dangerous Goods Regulations*, International Air Transport Association.³

Further biosafety and transportation information may be obtained from the Office of Laboratory Security, Centre for Emergency Preparedness and Response, Public Health Agency of Canada at (613) 957-1779, fax (613) 941-0596 or Web site <http://www.phac-aspc.gc.ca/ols-bsl/>.

References

1. Health Canada. *Laboratory biosafety guidelines*, 3rd ed. Available at: <http://www.phac-aspc.gc.ca/ols-bsl/lbg-ldmbl/index.html>
2. Transport Canada. *Transport of Dangerous Goods Regulations*. Available at: <http://www.tc.gc.ca/tdg/menu.htm>
3. International Air Transport Association. *Dangerous Goods Regulations*. Available at: <http://www.iataonline.com>

Appendix F – Laboratory Pandemic Influenza Communication Flow: Pandemic Alert Period



Appendix G – F/P/T Laboratory Services during a pandemic

This appendix is a working document and may change as new information becomes available.

INTERPANDEMIC PERIOD

Federal

- Establish the minimum laboratory proficiency testing standards required for pandemic preparedness and ensure that federal laboratories (or designates) meet these standards.
- Conduct surveillance to detect, subtype and characterize circulating seasonal influenza viruses, to provide an early warning of novel influenza strains that could pose a pandemic risk.
- Provide reference laboratory services to provincial/territorial laboratories.
- NML will represent Canada internationally as the WHO National Influenza Reference Laboratory and provide a liaison function with the CDC and WHO.
- Ensure that the information and reagents requisite for the diagnosis of novel human and animal influenza strains posing a risk to humans are shared in a timely fashion between the Canadian Food Inspection Agency and the Public Health Agency of Canada, and that relevant information and reagents are transferred to any provincial/territorial PHLs that may require them.
- NML will provide a leadership role in the communication of laboratory test results confirming the diagnosis of pandemic influenza and will establish case definitions for the laboratory diagnosis of pandemic influenza.
- Disseminate information and reagents necessary for diagnosis of novel influenza virus strains.
- Maintain a national reference collection of influenza virus isolates and antisera.
- Provide regular, annual or semi-annual influenza proficiency panels, recommend diagnostic protocols, and provide training workshops.
- Provide surge capacity for additional emergency laboratory testing in any jurisdiction where it is needed.
- NML will maintain accreditation at international standard level in quality assurance for key tests.
- Monitor for antiviral resistance.
- Perform technology transfer to Canadian PHLs.
- Participate in vaccine evaluation studies.
- Facilitate, coordinate and participate in ongoing collaborative diagnostics research.

- Maintain an up-to-date business continuity plan for service provision during a pandemic.
- Provide ongoing biosafety guidance on containment requirements.

Provincial/Territorial

- Designate provincial reference laboratories responsible for influenza laboratory testing in a pandemic.
- Ensure that all laboratories involved in national influenza surveillance and responsible for influenza testing in a pandemic participate fully in the national influenza proficiency program administered by NML.
- Ensure that equitable access to influenza testing by First Nations and Inuit populations is maintained through existing P/T laboratory service plans or covered by federal laboratories.
- Implement minimum criteria for PHL diagnostic capabilities as recommended by the CPIP Laboratory Task Group.
- Ensure that provincial or territorial laboratories (or designates) meet the minimum standards established for pandemic preparedness.
- Ensure that any laboratory test results indicating a positive diagnosis of pandemic influenza are confirmed by the NML.
- Ensure that any communications announcing the laboratory diagnosis of pandemic influenza within Canada are coordinated through the NML.
- Maintain routine comprehensive laboratory diagnostic services for influenza testing.
- Participate in the national influenza surveillance program by submitting representative strains to NML.
- Maintain a business continuity plan for laboratory services, including both front-line clinical and surveillance testing, biosafety facilities, stockpiling, and table-top exercises and training.

Public Health Network Council

- Communicate Council decisions that affect laboratories in a timely fashion to laboratory stakeholders.

PANDEMIC PERIOD

Federal

Continue interpandemic activities and include the following:

- Monitor the performance characteristics of existing tests.
- Provide laboratory services for the assessment of pandemic vaccine effectiveness.
- Rapidly communicate relevant information concerning the evolution of the pandemic to provincial and territorial clients, as well as internationally to WHO.

Provincial/Territorial

Continue interpandemic activities and include the following:

- Review of pandemic stockpiling as per pandemic plan.
- Ensure that the minimum standards for quality assurance are maintained.
- Submit strains from index cases to NML for confirmation and antigenic characterization.

Public Health Network Council

Communicate Council decisions that affect laboratories in a timely fashion to laboratory stakeholders.

Appendix H – Members of the Pandemic Influenza Laboratory Preparedness Network

The Pandemic Influenza Laboratory Preparedness Network (PILPN) operates under the auspices of the Canadian Public Health Laboratory Network, and it is responsible for the preparation of this laboratory annex. PILPN members are given below.

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Preparing for the Pandemic Vaccine Response

Date of Latest Version: September 2008

Summary of Significant Changes:

- The scope of the Annex has been expanded to provide a more comprehensive tool for health sector planners and, by doing so, support a Pan-Canadian approach to the operational issues identified as part of a pandemic vaccine strategy. A Background and Assumptions section provides information on Canada's current pandemic influenza vaccine contract with a domestic manufacturer and key assumptions used in planning. Also key cross-cutting issues have been addressed.
- The "priorities for vaccination" listing has been removed and replaced with a discussion of when prioritization might be needed. Included are considerations in the event that prioritization is needed and the implications for planners, with special emphasis on the requirement for flexibility in operational plans.
- The status of federal and national preparedness activities with respect to the pandemic vaccine strategy is summarized along with key actions for planners.

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1.0 Introduction

1.1 Purpose of the Annex

Immunization with a safe and effective pandemic vaccine has always been considered the cornerstone of the health response to pandemic influenza in Canada. The federal government has made a commitment to secure enough pandemic vaccine for every person in Canada in order to help prevent illness due to the pandemic virus. In addition, the federal government is committed to working with the provincial and territorial governments to ensure that the pandemic vaccine is made available to as many people as possible as quickly as possible. There are many challenges associated with this goal. This annex identifies those challenges that are currently being addressed at the pan-Canadian and federal level with an eye to improving general awareness and specific planning activities across Canada.

This version of Annex D replaces the version first published with the Canadian Pandemic Influenza Plan for the Health Sector (CPIP) in 2004 and subsequently in 2006. The previous version consisted mainly of a priority list for planners to use when considering how to deliver a priority-based immunization program. This guidance was intended to help focus operational plans geared towards identifying, accessing and immunizing subgroups of the population at the time of the pandemic. The provision of a numbered priority list may have unintentionally served to distract from operational planning activities. This version of Annex D is intended to focus on the need for flexible response plans and to re-emphasize that prioritization decisions (if required) will need to be based, in part, on data that will not be available until the pandemic virus has started circulating. Although this fact was identified in the previous version of the annex and in public communications, it was decided that removal of the priority list was the best way to shift emphasis. This decision should not necessitate any alteration to operational planning activities, which should, for the most part, be independent of the order in which population subgroups might be accessed.

Annex A (*Planning Checklists*) of the CPIP provides a preliminary list of planning activities for the pandemic vaccine program that were developed to facilitate planning at provincial and territorial (P/T) and local levels. The purpose of this annex (Annex D) is to ensure that all pandemic planners and potential responders are aware of both the preparations for the pandemic vaccine program that are under way at the federal and pan-Canadian level and the key cross-cutting planning issues. A secondary purpose is to provide information to members of the public who are seeking additional information regarding the pandemic vaccine program.

1.2 Background

With the creation of the pandemic readiness vaccine contract in 2001, Canada took a large step forward on the world stage in terms of pandemic preparedness. This investment clearly established the pandemic vaccine strategy as the cornerstone of the response to pandemic influenza in Canada and highlighted the need for attention to the issue internationally. Since

the establishment of this 10-year contract with a domestic manufacturer of influenza vaccine, planning has advanced on all fronts. However, the need for a safe and effective pandemic vaccine as early as possible in the global outbreak has remained the ultimate means to achieve the goals of reducing morbidity, mortality and societal disruption due to an influenza pandemic.

Canada's public health community is reasonably well integrated, each jurisdiction being familiar with its respective roles and responsibilities. In general, provision of services occurs primarily at the regional level with P/T governments overseeing, advising and funding these services. The federal government is responsible for ensuring that services are in place for specific populations, such as First Nations on reserve, the military and those incarcerated in federal penitentiaries. The federal government also has a role in coordinating and supporting initiatives for which there is a desire for national consistency across Canada or for which a single national point of contact is advantageous. Therefore, both orders of government have a role and responsibilities that pertain to a pandemic vaccine program.

1.3 Assumptions

In order to facilitate nationwide planning for an event that in many ways is unpredictable, it is useful to use a common set of assumptions as a starting point. The Pandemic Influenza Committee (PIC) has included a set of assumptions in the Background section of the CPIP. The following subset of the complete list is presented here because these assumptions have specific implications for the pandemic vaccine program in Canada:

- The next pandemic will first emerge outside of Canada.

Implication: The virus to be used for the pandemic vaccine will be isolated outside of Canada and sent to the manufacturer as a "primary seed lot". The government does not have control over when this will occur.

- The next pandemic virus will be present in Canada within three months after it emerges in another part of the world, but it could be much sooner because of the volume and speed of global air travel.

Implication: There will likely be cases of pandemic influenza in Canada prior to the availability of vaccine (see section 3.1 for more details regarding vaccine manufacturing timelines). While the extent of spread in Canada cannot be predicted, the vaccine may not be available until after the first wave of illness in this country.

- The first peak of illness in Canada could occur within two to four months after the virus arrives here. The first peak in mortality is expected to be approximately one month after the peak in illness.

Implication: There will likely be deaths due to pandemic influenza in Canada before the availability of vaccine.

- The impact of the pandemic in terms of severity, age distribution and extent of spread may be different from annual influenza; however, this will not be known until the novel virus starts spreading efficiently in the human population.

Implication: It will not be possible to identify in advance of the pandemic the individual risk factors for poor outcome of infection with the specific pandemic influenza virus.

- Individuals who recover from illness caused by the pandemic strain will be immune to further infection by that strain.

Implication: Those with a history of illness attributed to the pandemic virus may be considered at lower priority for immunization if prioritization is necessary. Criteria for determining who might be immune at the time the vaccine becomes available in Canada would need to be developed and consistently applied. It would not be feasible or advisable to use laboratory testing to identify all these individuals.

In addition, the Pandemic Vaccine Working Group of PIC suggests using the following vaccine-specific assumptions:

- A pandemic vaccine will become available in time to have an effect on the impact of the pandemic in Canada. The extent of the effect will largely depend on the timing of vaccine availability in comparison to pandemic activity in Canada.
- Two doses of vaccine will be needed in order to optimize protection (i.e. more protection will be provided by a second dose of pandemic vaccine). The two doses would be given approximately one month apart.
- Vaccine efficacy estimates developed before population distribution (e.g. in clinical trials) will translate into equal vaccine effectiveness once used in the general population.
- Because of cross-protection, a vaccine developed from a strain isolated early in the pandemic will still be beneficial should the pandemic virus “drift” over the course of the pandemic.
- The new pandemic vaccine is not likely to be 100% effective, but even a vaccine with relatively low efficacy (e.g. 30%) will help curb the effect of the pandemic.
- There will be limited information regarding vaccine safety before the rollout of the immunization campaign.
- Concern regarding vaccine safety and reactogenicity will likely be inversely proportional to the severity of the pandemic in Canada.
- Depending on the timing of the pandemic and availability of the pandemic vaccine, seasonal influenza immunization programs may not be initiated or completed, as the pandemic vaccine program is the priority.

2.0 The Pandemic Vaccine Program

2.1 Challenges

Universal vaccination has the advantage of creating a population that is highly resilient to the pandemic virus because of both individual protection and potential herd immunity. This requires a relatively simple intervention (i.e. one or two injections) over a relatively short period of time. While public health authorities are well versed in delivering mass immunization programs, challenges regarding the pandemic influenza vaccine strategy remain.

One of the key challenges is planning for, and successfully managing, the unprecedented uncertainty that will characterize the pandemic vaccine program. Those involved in pandemic planning are well aware that it is not possible to predict the timing, severity, viral characteristics, virus strain or epidemiology of an influenza pandemic in advance. Furthermore, there are the uncertainties regarding when a pandemic vaccine might be available, what the dose and

schedule will be, how effective it will prove to be and what the safety profile will be when the vaccine is used for the entire population. The reaction of the public to both the pandemic and the new pandemic vaccine also cannot be determined in advance. The severity of the pandemic, timing of vaccine availability during the pandemic, and real and perceived safety profile of the vaccine will likely be key drivers of the public reaction. This reaction will influence demand for the vaccine and consequently communication regarding the organization and implementation of the vaccine program.

Obviously, there are many communication issues that will need to be addressed as the pandemic evolves globally, and arrives and spreads across Canada. However, the expectation for, and availability of, a brand new pandemic vaccine for the Canadian population will create additional communication challenges. Since the entire population cannot be immunized simultaneously there will be a need to determine where those first batches of vaccine are sent and who gets the injections first.

There are several potential “rate-limiting steps”^{*} in the delivery of a population-wide pandemic vaccine program. If the new vaccine, which will become available in batches, were to be produced rapidly in sufficient batch sizes to allow for concurrent national distribution, then the rate-limiting step would shift closer to the front lines, where operational issues will ultimately determine the rate of administration to the public. However, if the vaccine supply were insufficient to meet the national vaccine administration rate (estimated on the basis of feedback from planners in advance of the pandemic) there would be a need to prioritize specific groups of people to receive the vaccine before others. Determining priority lists for immunization at the time of the pandemic will be challenging, because several factors will need to be considered, and it is possible that key information (e.g. comprehensive epidemiological data applicable to Canada) may be lacking. The rationale and measures taken to prioritize the supply will need to be communicated to the public.

2.2 Federal and F/P/T Preparations

As stated in the CPIP, the objectives of the pandemic vaccine program are as follows:

- To provide a safe and effective vaccine program to all Canadians as quickly as possible.
- To allocate, distribute and administer vaccine as rapidly as possible to the appropriate groups of people.
- To monitor the safety and effectiveness of immunization programs.

The following tables summarize the federal and national preparations to meet these objectives. In order to do this it will be critical for P/T and local plans to incorporate nationally agreed upon principles and recommendations, and translate these into comprehensive operational plans.

Legend for Tables:	
FPT = Federal/Provincial/Territorial	PHAC = Public Health Agency of Canada
HC = Health Canada	P/T = Provincial/Territorial
NACI = National Advisory Committee on Immunization	VVTAC = Vaccine Vigilance Technical Advisory Committee
PIC = Pandemic Influenza Committee	WG = Working Group

^{*} A rate-limiting step is a step in a sequential process that may be slow compared with those steps that follow but nonetheless must be completed first. An example of a rate-limiting step for the pandemic vaccine program could be the delivery of the vaccine to a remote location.

Table 1. Objective: provision of a safe and effective vaccine program to all Canadians as quickly as possible

Focus	Lead Group (i.e., point of contact for these actions)	Actions	Status
Pandemic vaccine production readiness	<i>Federal:</i> Centre for Immunization and Respiratory Infectious Diseases, PHAC	<ul style="list-style-type: none"> ▪ Maintain and revise as necessary vaccine readiness contract with manufacturer. ▪ Monitor status of clinical trials from contracted and other manufacturers to assess and optimize use of new technologies. 	<ul style="list-style-type: none"> ▪ Contract in place until March 2011, currently based on egg-based technology, ensures that domestic manufacturer can initiate production of pandemic vaccine at any time. ▪ Manufacturer has exceeded capacity target of 8 million monovalent doses per month. This capacity may further increase if use of new adjuvant permits a lower antigen content (e.g. 3.8 ug as opposed to 15 ug per dose); however two-dose schedule will likely be necessary.
Timely review of pandemic vaccine candidate(s)	<i>Federal:</i> Biologics and Genetic Therapies Directorate, HC	<ul style="list-style-type: none"> ▪ Ensure that mechanisms are in place that can be used to review and authorize a safe and efficacious vaccine for use in Canada within the shortest time frame possible. ▪ Ensure that trained staff are in place for the timely testing and release of pandemic vaccine lots after authorization for use. 	<ul style="list-style-type: none"> ▪ HC is prepared to perform an expedited review of any New Drug Submission for a pandemic vaccine. ▪ HC has examined other access mechanisms, including the Special Access Program, the use of interim orders and a clinical trial, to facilitate timely access to pandemic vaccine.
Prototype vaccine production to “test system” and potentially expedite review process	<i>Federal:</i> Centre for Immunization and Respiratory Infectious Diseases, PHAC	<ul style="list-style-type: none"> ▪ Funding allocated by federal government for development of prototype (“mock”) vaccines to facilitate testing and streamlining of the pandemic vaccine strategy. ▪ Meetings with contracted domestic manufacturer to monitor progress and finalize details. 	<ul style="list-style-type: none"> ▪ H5N1 adjuvanted vaccine being produced in Canada has been allocated to this initiative. ▪ Potential vaccine for New Drug Submission.

Focus	Lead Group (i.e., point of contact for these actions)	Actions	Status
	Biologics and Genetic Therapies Directorate, HC	<ul style="list-style-type: none"> ▪ Inspection of facilities and development of methods to test vaccine. ▪ Review Clinical Trial Applications to ensure that they are in accordance with Part C Division 5 of the <i>Food and Drug Act</i> and Regulations. 	<ul style="list-style-type: none"> ▪ Prototype vaccine has been produced, and methods for testing are under development. ▪ Clinical trial sponsored by manufacturer allowed to proceed.
Safety and efficacy testing	<p><i>Federal:</i> Centre for Immunization and Respiratory Infectious Diseases, PHAC</p> <p><i>National:</i> Pandemic Vaccine WG of the PIC</p> <p><i>Federal:</i> Biologics and Genetic Therapies Directorate, HC</p>	<ul style="list-style-type: none"> ▪ Facilitate and build clinical trial and vaccine evaluation capacity in Canada, and test using prototype vaccine. ▪ Review Clinical Trial Applications to ensure that they are in accordance with Part C Division 5 of the <i>Food and Drug Act</i> and Regulations. 	<ul style="list-style-type: none"> ▪ Have met with the manufacturer to hear and provide feedback on their plans for clinical trials. ▪ Clinical trials of vaccine produced in Canada planned for 2008/09. ▪ Canadian sites engaged in enhanced surveillance network for annual influenza vaccine.
Indemnity of vaccine manufacturer	<i>Federal:</i> PHAC	<ul style="list-style-type: none"> ▪ Secure indemnity agreement in order to prevent delays in release of new vaccine at time of pandemic. 	<ul style="list-style-type: none"> ▪ Current supply contract contains provisions stipulating that, until the vaccine is fully licensed under Canada's food and drug laws, Canada will compensate the manufacturer for any claims or lawsuits brought by third parties against it. Once vaccine is fully licensed, Canada's obligations to indemnify will end.

Table 2. Objective: allocate, distribute and administer vaccine as rapidly as possible to the appropriate groups of people

Focus	Lead Group	Actions	Status
Allocation of pandemic vaccine within Canada	<i>National:</i> PIC	<ul style="list-style-type: none"> ▪ Develop preliminary agreement on how vaccine will be distributed within Canada. 	<ul style="list-style-type: none"> ▪ Principle of equitable access agreed upon. ▪ Per capita distribution favored in absence of more details regarding the epidemiology of the pandemic.
Distribution of product	<p><i>Federal:</i> Public Works and Government Services Canada (as contracting authority, once allocation was agreed upon)</p> <p><i>National:</i> Vaccine Supply WG of the Canadian Immunization Committee</p>	<ul style="list-style-type: none"> ▪ Secure agreement with vaccine manufacturer for distribution of pandemic vaccine from manufacturing site to specified depots. ▪ Coordinate with P/T and federal government divisions as necessary to ensure that plans are in place for transportation of vaccine from depot to administration sites and identify any security concerns. 	<ul style="list-style-type: none"> ▪ Distribution plan from manufacturer to as many as 80 destinations across Canada. Preliminary destinations (1-2 per province and territory) have been specified; additional delivery points still to be identified. ▪ Centre for Immunization and Respiratory Infectious Diseases (PHAC) has plans to look at feasibility and implementation issues regarding a “lot distribution map” for annual influenza vaccine. Purpose is to facilitate investigation of any clusters of adverse events following immunization that may be due to a specific vaccine lot. Could potentially be applied to distribution of the pandemic vaccine (for the same purpose).

Focus	Lead Group	Actions	Status
Other supplies required for vaccine program	<i>National:</i> Vaccine Supply WG of the Canadian Immunization Committee	<ul style="list-style-type: none"> ▪ Support national discussion regarding the quantity and availability of other supplies (e.g. syringes and needles) that would be needed to deliver the pandemic vaccine program; whether stockpiling is necessary; and how that might be managed (e.g. feasibility of stock rotation), given the uncertainty of pandemic arrival. ▪ Identify supplies for which bulk purchase may be desirable. 	<ul style="list-style-type: none"> ▪ P/Ts have primary responsibility and have, so far, acted on their own behalf; some P/T stockpiles exist. ▪ Preliminary lists of supplies have been developed. ▪ Some manufacturers of these supplies have been contacted and have provided information of projected availability at time of pandemic. ▪ Federally coordinated bulk purchase has been provided as an option to P/Ts (has not been implemented at this time).
Vaccine recommendations	<i>National:</i> Pandemic Vaccine WG of the PIC (together with NACI representation)	<ul style="list-style-type: none"> ▪ Make recommendations regarding the vaccine dose, schedule, contraindications and route of administration for the pandemic vaccine. 	<ul style="list-style-type: none"> ▪ The Pandemic Vaccine WG includes members of NACI (including the Chair of NACI and the NACI subgroup that is responsible for seasonal influenza vaccine recommendations), in addition to experts on clinical trials, laboratory science and pandemic influenza. This group is prepared to make these recommendations when necessary.

Focus	Lead Group	Actions	Status
Prioritized use of pandemic vaccine	<i>National:</i> Pandemic Vaccine WG of the PIC	<ul style="list-style-type: none"> ▪ Divide Canadian population into subgroups that may be used if vaccine administration must be prioritized, in order to facilitate planning (i.e. identification, communication and access) at the P/T and local level. ▪ Consider the order of administration to these population subgroups and what variables might result in re-ordering the groups. 	<ul style="list-style-type: none"> ▪ Subgroups have been identified, but order of receipt of vaccine will ultimately depend on many factors, including the epidemiology and dynamics of the pandemic. ▪ See section 3.3 below for further discussion of this key issue.
Public communication plans	<i>National & Federal:</i> Communications Working Group of PIC & PHAC Communications Directorate	<ul style="list-style-type: none"> ▪ Facilitate coordinated and consistent messaging regarding the pandemic vaccine across Canada with the international community, and stakeholders. 	<ul style="list-style-type: none"> ▪ Preliminary key messages have been developed. More refined key messages are in development.

Table 3. Objective: monitor the safety and effectiveness of vaccination programs

Focus	Lead Group	Actions	Status
Post-release safety monitoring	<p><i>Federal:</i> Centre for Immunization and Respiratory Infectious Diseases, PHAC</p> <p>Biologics and Genetic Therapies Directorate, HC</p>	<ul style="list-style-type: none"> ▪ Develop guidelines for monitoring of vaccine use during a pandemic and identify issues related to tracking of adverse events following immunization and to liability. ▪ Develop system for timely analysis of received reports and dissemination of data back to P/Ts. ▪ Support new VVTAC activities. ▪ Develop communication plans to involve FPT health and immunization programs and the public. ▪ Appropriate regulatory action if required. 	<ul style="list-style-type: none"> ▪ Plans: pilot testing of a strategy to capture self-reported vaccine safety information from a cohort of those first to be immunized; testing strategies for rapid early collection and integration of data from multiple sources (e.g. clinics, Web-based reporting, phone lines, hospital-based sentinel sites); and weekly analyses of safety information with a mechanism in place for independent expert review and advice. ▪ Pilot testing of a rapid, shared communications strategy. ▪ Explore VVTAC role in making recommendations regarding cessation of immunization due to safety concerns.
Vaccine effectiveness evaluation <i>(Note: Currently there is no way to evaluate effectiveness of an influenza vaccine against death; this remains an outstanding issue with surveillance implications)</i>	<i>National:</i> Pandemic Vaccine WG of PIC	<ul style="list-style-type: none"> ▪ Develop protocol that can be implemented at the time of the pandemic to give vaccine effectiveness estimates. 	<ul style="list-style-type: none"> ▪ Potential groups for participation in evaluation have been identified. ▪ Methodology is being rehearsed using seasonal data from sentinel sites (i.e. against infection and hospitalization).

3.0 Cross-cutting Planning Issues

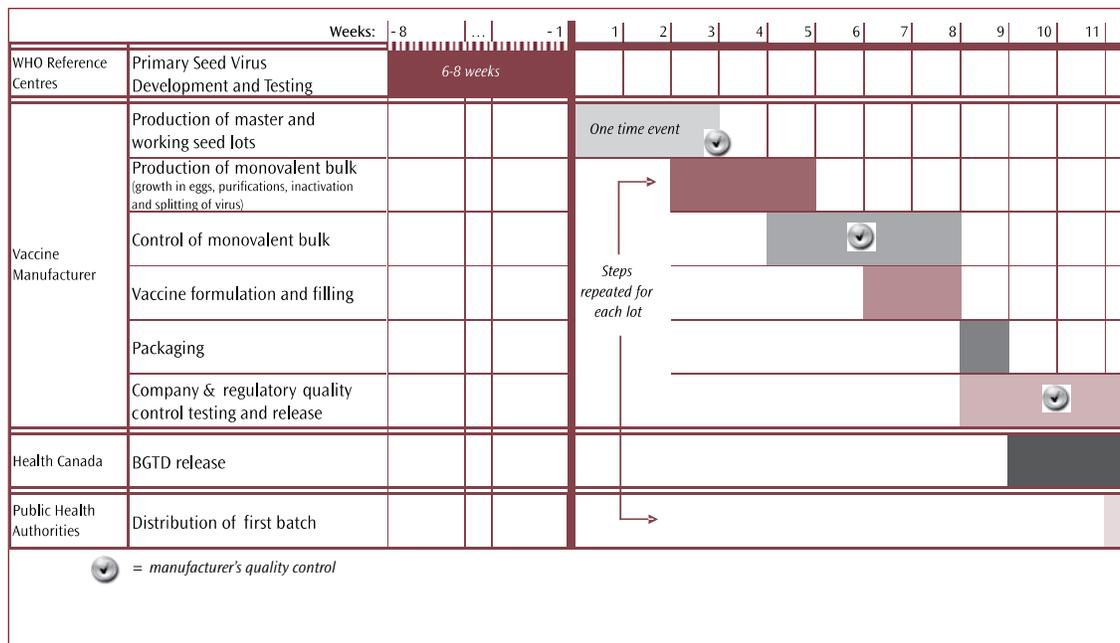
The following sections are intended to highlight issues that affect planning at all levels. These issues are key items on the agenda at the national and federal planning tables, but, like most other national or federal pandemic planning issues, the ultimate impact will occur at the level of program implementation.

3.1 Vaccine Manufacturing Timeline

Influenza vaccine is manufactured every year according to a predetermined timeline. Typically, the World Health Organization (WHO) confirms the recommended virus strains for the Northern Hemisphere vaccine in February, and national/regional strain selection occurs in March. This is followed by seed lot production in April, various production and quality control steps throughout the summer months resulting in a product ready for regulatory approval in August, and batch release occurring in August, September and October. This schedule is designed to provide vaccine for administration starting prior to the typical influenza season in Canada (i.e. November-April). However, even though this is a tried and tested annual process, there can be uncontrollable delays or complications in the manufacturing process that result in delays in product availability and, rarely, vaccine shortages.

It is important to keep in mind that although a great deal of effort is being put into streamlining and shortening this timeline for production of a pandemic vaccine, the process will still be vulnerable to the uncontrollable delays or complications that have been experienced with the annual influenza vaccine. Therefore, whenever the timeline for pandemic vaccine manufacturing is presented, it should be considered as a “best case scenario”. The following diagram represents the current “best case” timeline for production of the first batch of a pandemic vaccine in Canada. At this time it is expected that the product will be a split virus adjuvanted vaccine manufactured in Canada using egg-based technology.

Figure 1. Pandemic Vaccine Manufacturing Timelines



The development of the primary seed with full safety testing by WHO collaborating laboratories can take 6-8 weeks. This may be shortened somewhat if the seeds are forwarded to the manufacturer before the safety testing is complete; however, the manufacturers must work under biosafety level 2+ conditions. The timeline presented in Figure 1 is for the first lot of vaccine. After this, lots could be produced on a routine basis because the process is continuously repeated. Note that the production of the seed lots occurs once, whereas the subsequent steps are repeated for each lot.

The production process consists of growth of the virus in eggs, purification, inactivation and splitting of the virus to produce the monovalent bulk, followed by the formulation and filling into vials. There are quality control tests performed at a minimum on the seed lots, the monovalent bulk and the final product. The manufacturer could perform some of the quality control testing in parallel, although this carries a risk of formulating and filling a lot that could subsequently be useless if the product fails “upstream” testing.

This timeline of 10-12 weeks to obtain the first batches will only be possible if a production process for the pandemic vaccine is in place and parallel testing by the Biologics and Genetic Therapies Directorate (BGTD) occurs. Manufacturers are working through production process requirements by developing prototype vaccines, specifically the process to manufacture H5N1 vaccine. If the product currently manufactured in Canada is submitted for and receives regulatory approval, it may be possible to streamline the approval of future novel influenza vaccines if, as with the annual vaccines, the only change is the use of a different virus strain.

As described previously, BGTD is working to ensure that mechanisms are in place for review and authorization of a safe and efficacious vaccine for use in Canada within the shortest time frame possible, and that trained staff are available for the timely testing and release of pandemic vaccine lots after authorization for use. The Centre for Immunization and Respiratory Infectious Diseases, PHAC, will continue to support the development of a clinical trial network to facilitate rapid in-Canada evaluation of a new pandemic vaccine and, with the Pandemic Vaccine Working Group of PIC, will monitor research regarding novel vaccine development and new technologies aimed at improving production timelines. Dose-sparing strategies will also be monitored for potential application to the Canadian plans.

3.2 Vaccine Production and Administration Rate

In the current vaccine readiness contract the vaccine manufacturer is committed to a production rate target of 8 million monovalent doses of pandemic vaccine per month (i.e. approximately 2 million doses per week). This target was created when the contract was first developed in 2001, with the working assumption that each monovalent dose would contain 15 ug of antigen. In an effort to accelerate the potential production rate the domestic manufacturer developed and added a novel adjuvant to test batches of a new H5N1 vaccine. Clinical trials with a similar product in Europe have suggested that a dose containing 3.8 ug of antigen with the novel adjuvant is sufficient to induce a significant immunological response to H5N1 in the vaccine recipient. Specifically, early testing suggests that a schedule of two doses of this vaccine would be sufficient to induce a protective response in approximately 80% of healthy adult recipients.¹

These results are promising but are specific to the H5N1 product, which uses 3.8 ug of antigen per dose; it is not known whether 3.8 ug of antigen will be sufficient when developing vaccines with different novel influenza strains. There could also be a difference in yield with new influenza strains. Finally, the production of monovalent bulk is only one step in the manufacturing process,

and currently other limitations would preclude the production of a final product at a rate of 32 million doses per month (i.e. 8 million doses per week).

Ideally, the rate at which vaccine is administered to the population should keep up with the production rate of vaccine. Previously, planners were asked to be prepared to vaccinate the entire Canadian population (approximately 32 million people) over the course of four months, corresponding to the production rate of 8 million doses per month (or 2 million doses per week). Given the promising results with the lower antigen content in the current H5N1 vaccine, it is now prudent for planners to consider how they might administer vaccine more rapidly to the population if the pandemic vaccine is produced at a faster rate than previously expected.

Planners are now encouraged to consider what their maximum vaccine administration rate would be based on current plans and whether this could be increased to a maximum of 25% of their population per week should the production of pandemic vaccine be accelerated to that level. The implication is that flexible (or a range of) strategies for vaccine administration should be in place to deliver vaccine at a rate that matches the vaccine production rate. For planning purposes, this range should be considered to be 6.25% to a maximum of 25% of the population per week.

Assuming that two doses of vaccine given approximately one month apart will be necessary for optimal protection, a key planning question becomes, at what point do the operational issues related to delivering a program based on priority groups become an impediment to achieving the optimal administration rate? A simple illustration of this concept is a family consisting of a health care worker, a healthy spouse, one school-age child and one child under 2 years of age. Each of these family members could be given different priority for immunization and directed to different clinic locations, since they are all in different subgroups of the population. For the clinic administrators and for the family it would likely be more efficient and expedient to simply immunize the whole family (or at least the non-health care worker and the children) at one session and ask them all to come back at the appropriate interval for the second dose. This approach could eliminate the need for the clinic team to verify eligibility to receive the vaccine based on priority group, simplify public messaging, potentially reduce confusion and public aggravation at clinic sites, and likely make clinic planning more efficient by making clinic attendance more predictable. In geographically isolated communities the potential efficiency of this approach would be even more evident, as immunization teams could schedule clinics in a way that would reduce the number of community visits required to deliver the population-based program.

3.3 Prioritization

Although enough vaccine will be made to immunize all Canadians, the new pandemic vaccine will still become available in batches, necessitating decisions regarding how these doses will be distributed across Canada and whether to prioritize certain subgroups of the population ahead of others. As indicated earlier, the degree to which prioritization is needed will be linked to the vaccine production and administration rate.

At this time there is no policy decision regarding distribution of the first doses of vaccine across Canada. While a per capita approach seems to be the most equitable approach and should be used for planning purposes, there are other factors that may influence this decision at the time. For example, if the vaccine becomes available as first wave activity appears to be subsiding in some provinces but escalating in others, perhaps the first doses should be sent to the area where activity is escalating in an effort to mitigate the impact of the first wave in those locations. Alternatively, the provinces with subsiding activity might be in the best position to deliver mass immunization programs, as human resources could be shifted away from patient care, given the declining

number of new cases, and into vaccine administration. Mathematical modeling and feedback from pandemic planning exercises may provide some insight with respect to this issue, but there are other factors that will also need to be considered. Final allocation decisions, therefore, may not be made until the pandemic is under way and the vaccine becomes available.

In order to assist with preparations for implementation of a priority-based strategy at the local level, the Pandemic Vaccine Working Group of PIC developed priority groups (i.e. subgroups of the entire population) for planning purposes, which were published as a numbered list in Annex D, both with the 2004 and the 2006 edition of the CPIP. This document is now replacing that version of Annex D.

The subgroups of the population identified in the previous version of Annex D have been retained, as each group has commonalities, such as a role in contributing to the pandemic planning goals and potential access strategies, which make the groupings logical from a planning perspective. These existing subgroups of the Canadian population can be classified into occupation-based groups, high-risk groups and healthy adults and children (i.e. those not a part of the occupational groups identified). Table 4 lists the working definition for each of the subgroups and gives examples of who might be included in each group. The subgroups are intended to be mutually exclusive but, together, to cover the entire Canadian population. Most of these definitions can also be found in the Glossary for the Plan. **The groups are presented in alphabetical order: this table does not represent a priority list.**

Table 4. Population subgroups

Population Subgroup (NOT priority order)	Definition (for the purposes of this process)	Examples of who would make up the group and how they might be accessed
Health care workers	Persons who work in settings where essential health care is provided	Nurses, physicians, laboratory workers, pharmacists, emergency medical services <ul style="list-style-type: none"> • Might be accessed through work-place-based clinics
Healthy adults	All individuals, 18 years of age and over, who do not have a medical condition or fit into an age category that would qualify them for inclusion in the high-risk group and who do not fall into one of the other occupation-based groups <i>(Note: if adults 65 years and over are considered to be at “high risk of poor outcome”, as they are on a seasonal basis, then they would not be included in this group)</i>	<ul style="list-style-type: none"> • Might be accessed through community-based clinics
Healthy children	All individuals, 2-17 years of age, who do not have a medical condition that would qualify them for inclusion in the high-risk group	<ul style="list-style-type: none"> • Might be accessed through school or community-based clinics

Population Subgroup (NOT priority order)	Definition (for the purposes of this process)	Examples of who would make up the group and how they might be accessed
High risk (of poor outcome)	Those groups in which epidemiological evidence indicates that there is an increased risk of poor outcome due to the disease	This would have to be determined according to the epidemiology of the pandemic** <ul style="list-style-type: none"> • Might be accessed through dedicated clinics at locations convenient for the particular groups (e.g. nursing homes for residents)
Key health decision makers*	Persons whose decision-making authority is necessary for implementing and maintaining the health sector response to pandemic influenza	Medical officers of health, hospital Chief Executive Officers and Chiefs of Staff, Ministers of Health <ul style="list-style-type: none"> • Might be accessed through workplace-based clinics)
Key societal decision makers*	Persons whose decision-making authority will be necessary at the time of the pandemic to minimize societal disruption	Mayors, police chiefs, fire chiefs, judges, other government ministers <ul style="list-style-type: none"> • Might be accessed through workplace-based clinics
Public health responders*	Persons who are essential to the implementation and maintenance of the public health response to pandemic influenza and who would not be expected to come within 1 meter of a known influenza case in their work setting	Public health nurses not involved in patient care, other public health staff, public health administrators <ul style="list-style-type: none"> • Might be accessed through workplace-based clinics
Pandemic societal responders*	Persons who are trained or primarily involved in the provision of an essential service that, if not sustained at a minimal level, would threaten public health, safety or security	Police officers, firefighters, corrections officers, utility workers, mortuary staff <ul style="list-style-type: none"> • Might be accessed through workplace-based clinics
<p>* These definitions were developed to facilitate pandemic planning regarding the identification of specific groups that may be targeted as part of specific public health interventions and therefore may not be well recognized outside of the public health sector. Also note that where the third column in the table includes occupational groups, this has been provided as an example and is not intended to be inclusive or to convey that the entire occupational group would meet the criteria for inclusion in this defined population subgroup for immunization.</p> <p>** For planning purposes the high-risk groups for annual influenza (as identified by the National Advisory Committee on Immunization) have been used:</p> <ul style="list-style-type: none"> • Adults and children with selected chronic health conditions if significant enough to require regular medical follow-up or hospital care. These high-risk conditions include the following: <ul style="list-style-type: none"> • cardiac or pulmonary disorders (including bronchopulmonary dysplasia, cystic fibrosis and asthma), diabetes mellitus and other metabolic diseases, cancer, immunodeficiency, immunosuppression (due to underlying disease and/or therapy), renal disease, anemia or hemoglobinopathy, conditions that compromise the management of respiratory secretions and are associated with an increased risk of aspiration, children and adolescents with conditions treated for long periods with acetylsalicylic acid. • People of any age who are residents of nursing homes and other chronic care facilities. • People ≥ 65 years of age • Healthy children aged 6 to 23 months • Pregnant women 		

Determining the order in which these subgroups of the population would receive vaccine is a much more difficult task and one that experts concur must take into consideration several

factors, many of which will not be known until the pandemic occurs. The following are examples of these factors and considerations:

- **Impact on pandemic goals** (i.e. minimizing serious illness, overall deaths and societal disruption): minimizing serious illness and overall deaths would suggest giving high-risk groups and health care workers priority over others. However minimizing societal disruption may favor prioritization of the critical infrastructure occupational groups and perhaps healthy adults.
- **Operational considerations** (e.g. size of the group, ease of identification and accessibility): depending on the amount of vaccine available it may be easiest to prioritize smaller groups that can be easily located and identified, for example, health care workers, or to immunize everyone in a remote community at once.
- **Severity/epidemiology of the pandemic:** a severe pandemic may result in public pressure to immunize children first. Similarly if the pandemic virus is similar to one that has circulated previously (e.g. H2N2) it may make sense to prioritize the age groups that would not be expected to have been exposed to a similar virus previously.
- **Difference in vaccine effectiveness between groups** (e.g. if vaccine effectiveness is significantly lower in the elderly and immunocompromised): this may favour prioritizing the “healthy” over some of the high-risk groups.
- **Timing of vaccine availability** (e.g. end of first wave, inter-wave period, start of second wave): availability between waves may favour prioritization of the occupational groups in preparation for the next wave or those in high transmission settings like school-age children, in an effort to flatten the epidemic curve of the second wave. Vaccine availability at the start of a second wave may lead to prioritizing those at high risk, especially if a significant proportion of the other groups are expected to have developed immunity during the first wave.
- **Public opinion and risk perception as a consideration** (e.g. perceived severity of the pandemic and risks of the vaccine): the public may want children to be immunized first if the pandemic is severe. Alternatively, if the pandemic is perceived as relatively mild and the vaccine is highly reactogenic, the public may wish to delay immunizing children until more is known about the long-term effects of the new vaccine.

Conceptualizing how all these variables might interact in order to present a menu of priority lists for each possible contingency is not an efficient use of time or resources. There are simply too many potential combinations of factors and considerations, and many of these (e.g. public opinion) may not be “static” over the course of the pandemic. Such lists would run the risk of derailing planning efforts: with focus on the order of the population subgroups, many planners would be forced to spend time justifying the lists instead of working on how the specific groups of people would be identified and accessed should it be necessary to prioritize them as part of the pandemic vaccine program.

It is envisioned that at the time of the pandemic the Pandemic Vaccine Working Group would make recommendations regarding whether prioritization of the vaccine supply is necessary and, if necessary, the order in which the subgroups of the population would be immunized and whether any subgroups should be targeted at the same time. The Pandemic Vaccine Working Group of PIC is dedicated to developing a prioritization decision-making strategy or tool that would encompass the factors and considerations listed previously. This strategy/tool would be made publicly available for educational purposes, but ultimately it is expected to be used by the Working Group to make recommendations regarding prioritization to PIC and subsequently to the Public Health Network Council. The national policy decision regarding the order in which the

population subgroups should be immunized across Canada would likely be made by Ministers of Health on the advice of the Chief Medical Officers of Health and the Public Health Network Council, with the strong recommendation that the order decided on would be consistently applied across Canada.

3.4 New Influenza Vaccine Developments

In an effort to improve global preparedness for pandemic vaccine production, the WHO encourages research and development for new influenza vaccines² (i.e. prototype novel influenza vaccines) and approaches that may decrease production timelines (e.g. cell culture). Asian-strain H5N1 virus seed lots were made available for this initiative. Recently, there have been several forums (WHO meetings, vaccine conferences etc.) at which the manufacturers have provided information and clinical trial data on their prototype vaccines. As a result of promising efficacy data and evidence suggesting that some products may provide cross-protection against different clades* of the same virus, some manufacturers have proceeded to submit these vaccines for approval by various regulatory authorities.

In addition, the concept of using these new H5N1 vaccines to “prime” individuals in preparation for an H5N1 pandemic has been introduced. The intention would be to ultimately decrease the time to vaccine-induced protection by administering a vaccine with a strain similar to that expected to be responsible for the next pandemic and then to administer a specific pandemic strain vaccine to these individuals as soon as it becomes available. The expectation is that the first dose (the “pre-pandemic” vaccine) would serve to prime the individual’s immunological response, and the second pandemic strain-specific dose would serve as a booster, eliciting specific protection against the pandemic virus.

Some countries are now considering, or are actually stockpiling, pre-pandemic vaccine, which at this time is available only for the Asian-strain H5N1 virus.

Other vaccines under investigation include whole virus vaccines, other adjuvanted vaccines (e.g. alum adjuvanted), vaccines targeting internal proteins (as opposed to the H and N surface proteins) and vaccines that can be administered using different routes (e.g. intradermal and transdermal). The Pandemic Vaccine Working Group will continue to monitor new influenza vaccine developments and potential implications for planning in Canada.

3.5 Stockpiling

Technology has now advanced to the point at which pre-pandemic influenza vaccines against novel influenza viruses are starting to become available for purchase by governments. Some countries have already stockpiled or have committed themselves to stockpiling a new Asian H5N1 vaccine as part of preparedness activities for an H5N1 influenza pandemic. Canada does not have a stockpile of H5N1 vaccine and is continuing to focus on strategies to increase general preparedness against pandemics of any influenza subtype. However, the Pandemic Vaccine Working Group will continue to review the science related to H5N1 vaccines to inform further decision making. This review will include ongoing monitoring for evidence of the effectiveness of priming with novel influenza vaccines.

* The term “clade” is defined as “related organisms descended from a common ancestor”, see www.medterms.com. At this time at least three clades of the highly pathogenic H5N1 virus have been identified.

It is important for planners at the P/T and local level to determine whether it will be necessary to stockpile supplies that would be required to implement mass immunization clinics targeting the entire Canadian population once a pandemic vaccine becomes available. This work is being supported nationally by the Vaccine Supply Working Group of the Canadian Immunization Committee. However, these discussions need to be informed by P/T and local level planners, who are in the best position to plan with those delivering health care, as key issues such as stock rotation are more conducive to local arrangements.

4.0 Action Items

The following list is a summary of key action items that have been derived from the content of this annex. This list is intended to supplement the list already provided in Annex A of the CPIP and to highlight areas in which national and/or federal preparedness activities are linked to operational planning issues.

- Planners need to determine whether (and how) they could administer one dose of vaccine to their entire population within one month. If this is not feasible, they need to determine what the fastest achievable and sustainable administration rate is for the community they serve in the context of a pandemic, when human and other resources may be limited.
- Planners need to be prepared to implement both a non-prioritized and prioritized pandemic immunization program, recognizing that they may be notified which is to be implemented at very short notice and that, regardless of the strategy, they will ultimately be trying to immunize essentially the entire population.
- Planners need to determine whether using a non-priority-group based strategy makes the most sense for any segments of the population in their jurisdiction. An example may be remote, isolated communities.
- Planners need to develop methods of identifying the numbers for each population subgroup and how best to confirm inclusion in a particular subgroup at the level of the immunization clinic.
- Planners need to ensure that the appropriate communication channels are in place to
 - update key players at the local level regarding the implications of the latest science and technology and the status of plans for the pandemic vaccine program as part of ongoing preparedness;
 - provide the public with the information they will need regarding the pandemic vaccine program;
 - facilitate implementation of the program as consistently as possible across Canada (based on nationally agreed upon recommendations and policies);
 - mobilize the resources required to rapidly implement mass immunization clinics (including sources and training of “surplus” immunizers).
- With respect to the pandemic vaccine strategy, planners need to stockpile the medical supplies (e.g. syringes) that will be integral to the implementation of mass immunization clinics.
- Currently, pandemic planning at the P/T and local level should include the following:
 - consideration that the 10-12 week timeline for pandemic vaccine production is a best-case scenario;

- recognition that expected delivery dates for pandemic vaccine may be delayed;
- a feedback loop for timely notification of any suspected serious or unusual adverse events following immunization.

5.0 Research

Research will play a key role in informing both preparedness and response activities. The PHAC and the Canadian Institutes of Health Research (CIHR) hosted a meeting in September 2005 to identify research priorities and develop a strategic, multi-year research agenda for influenza. Proceedings from this meeting are available at: <http://www.cihr-irsc.gc.ca/e/30967.html>.

The pandemic vaccine strategy could benefit from research conducted during annual influenza seasons. There is also a need to have research protocols ready for implementation at the time of the pandemic in order to better inform decision making and post-pandemic evaluation.

In response to this need, PHAC and CIHR launched a Request for Applications (RFA) for Catalyst Grants for Pandemic Preparedness to mobilize the research community for an outbreak response (see: <http://www.researchnet-recherchenet.ca/rnr16/viewOpportunityDetails.do?prog=312&view=browseArchive&browseArc=true&progType=CIHR-1&type=AND&resultCount=25>). Catalyst Grants allow for the planning and preparatory phase of research projects that will be essential for pandemic control during an outbreak. The vaccine-relevant research areas addressed depend on the outcome of peer review, but the evaluation of vaccine effectiveness and investigation of adverse events following immunization are expected to be included.

In addition to research activities currently under way, a PHAC/CIHR RFA for Team Grants (see: <http://www.cihr-irsc.gc.ca/e/32804.html>) called for applications related to vaccines and immunization programs, such as research into the optimal use and efficiency of existing vaccines and the development of novel vaccination technologies, including means of vaccine delivery. It is expected that successfully peer reviewed projects will be under way by the spring of 2008.

Finally, PHAC and CIHR launched a Funding Opportunity for the establishment of an Influenza Research Network (IRN) in December 2007. The IRN will mobilize nation-wide research experience and talent in vaccine evaluation in order to develop and test methodologies/methods related to the safety, immunogenicity and effectiveness of influenza vaccines in persons of all ages before and after release of the vaccines for general use. It is expected that the successfully peer-reviewed project will be under way by the spring of 2009.

As pandemic preparedness activities and research continue to be a global priority, it is important that research findings and new technologies from outside Canada are monitored, shared and used to inform future plans. At this time there are many vaccine-related research activities being undertaken. Another area of interest is mathematical modeling, which might shed further light on the potential impacts of different prioritization strategies.

6.0 Conclusions

Optimal planning for the pandemic vaccine program requires the development of flexible plans at all levels of government. F/P/T planning activities have been identified according to the usual roles and responsibilities (i.e. with respect to the delivery and organization of health care) but also with consideration of when a centralized approach is most efficient – for example, when securing a vaccine contract for the production of pandemic vaccine. Planning at these levels must be informed by the operational realities of what can be expected when implementing such a massive undertaking at a time of stretched resources and intense public awareness and scrutiny.

No plan is or will be perfect; in fact, it may only be in hindsight that areas of improvement can be identified. Given the uncertainties and changing context that are characteristic of pandemic planning, the most that planners can do for Canadians is to make sure that plans are based on the best information available at a given time and that they continue to evolve. They should be based on the best available science, technology, and resources, and ensure that public needs and expectations are managed through education of the public by experts and through education of experts regarding public values and expectations.

1. GlaxoSmithKline. *GSK reports significant advance in H5N1 pandemic flu vaccine programme*. Press release. London, England, and Rixensart, Belgium, July 26, 2006.
2. World Health Organization. *Global pandemic influenza action plan to increase vaccine supply*. September 2006. Available at: http://www.who.int/csr/resources/publications/influenza/CDS_EPR_GIP_2006_1.pdf.

Planning Recommendations for the Use of Anti-Influenza (Antiviral) Drugs in Canada During a Pandemic

Date of Latest Version: October 2006

Summary of Significant Changes:

- Reflects the establishment of the National Antiviral Stockpile and provides information on the size, use and composition of the stockpile;
- Specific references to “priority groups” have been removed since they no longer are consistent with the decisions made to date regarding the use of the stockpile;
- Contains updated scientific data, regulatory information, policy decisions and knowledge based on experience, acquired since last version (2004);
- Uses new Pandemic Phase terminology.

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1.0 Introduction

The purpose of this annex is to provide information and recommendations that will assist pandemic planners with the development and refinement of their respective antiviral strategies. Recommendations of the Pandemic Influenza Committee are intended to facilitate consistent use of antivirals across Canada at the time of an influenza pandemic and to form the basis for an effective, equitable, flexible and informed national antiviral strategy. It will be necessary to review all recommendations and implementation plans once a pandemic strain has emerged so that any changes in epidemiology or other data (e.g. antiviral resistance, optimal treatment course) can be accounted for in the implemented strategy.

2.0 Role of Antivirals

Vaccination with an effective vaccine is the primary public health intervention during a pandemic. However, vaccine production requires the acquisition of the seed virus and therefore cannot be initiated until the pandemic virus is already infecting humans. Once a suitable vaccine seed strain is available to manufacturers, it is anticipated that vaccine production will require at least 3 to 4 months and even then the availability of doses will be staggered and limited. Furthermore, each individual may need to receive two doses of vaccine to be protected.

At this time antivirals (anti-influenza drugs) are the only specific medical intervention that targets influenza and that potentially will be available during the initial pandemic response. Antiviral drugs can be used to prevent influenza and, unlike vaccines, can also be used to treat cases that are identified early in their illness. While there is good evidence for reduction of complications of influenza, there is not evidence for reduction in influenza mortality. Protection afforded by antivirals is virtually immediate and does not interfere with the response to inactivated influenza vaccines. The strategic use of these drugs during the Pandemic Period will be critical to achieving the pandemic goals of firstly to minimize serious illness and overall deaths, and secondly to minimize societal disruption among Canadians as a result of an influenza pandemic.

Before the 1997 Hong Kong avian influenza incident, antivirals were not considered as a component of the Canadian pandemic response, in view of the costs and other factors. During the Hong Kong outbreak, several countries rapidly depleted global supplies of anti-influenza drugs. In light of the lessons learnt since 1997 and the approval for sale of new antivirals (the neuraminidase inhibitors), the Antivirals Working Group of PIC was formed to develop options, recommendations and guidelines for the use of antivirals. The key recommendation of this working group, which was subsequently endorsed by PIC, was the need to secure a supply of antiviral drugs in Canada to mitigate the consequences of an influenza pandemic.

The national antiviral stockpile was established in the fall of 2004. Outside of the current stockpiled quantities, the supply of antivirals in Canada is limited. To date there has been relatively little use of these drugs in Canada. During annual influenza seasons, they have been used primarily to control outbreaks in health care and long-term care institutions. During the 2003 domestic avian influenza outbreak in British Columbia, they were also used for prophylaxis of individuals exposed to avian influenza because of their roles in outbreak control (e.g. cullers).

As a result of this history of limited demand, there has been little incentive for manufacturers to store significant amounts of these products in Canada, and there is little practitioner and public experience with these drugs.

3.0 Classes of Antiviral (Anti-Influenza) Drugs

Two classes of antiviral drugs are currently approved in Canada for prevention and/or treatment of influenza infection: M2 ion channel inhibitors and neuraminidase inhibitors. There are important differences in pharmacokinetics, side effects and drug resistance between these two classes of antivirals. Such performance characteristics and the costs should be considered in selecting the specific drugs to be used for prophylaxis or treatment. Summary information on these drugs is presented in the following table.

3.1 Neuraminidase Inhibitors

Oseltamivir (Tamiflu) and zanamivir (Relenza) are the two neuraminidase inhibitors that are currently approved for use in Canada. They are currently the only neuraminidase inhibitors in the global market; however, other agents such as peramivir are under development. Oseltamivir and zanamivir interfere with replication of both influenza A and B viruses in three ways: (1) they interfere with the release of virus from infected cells, (2) they cause the aggregation of virus, and (3) they may improve the inactivation of virus by respiratory mucous secretions. The drugs are well tolerated and have been used effectively for the treatment and prophylaxis of influenza A and B infections. They are expected to be effective against pandemic viruses including H5N1. H5N1 viruses are susceptible to neuraminidase inhibitors in vitro and oseltamivir has been shown to protect mice against lethal experimental H5N1 influenza pneumonia, although at higher than usual doses.⁽²⁾

Neuraminidase inhibitors are effective when administered within 2 days of onset of illness.⁽³⁾ When used in this way current estimates of the benefits of oseltamivir therapy include a 25-30% reduction in symptom duration plus a reduction in illness severity, a 59% reduction in hospitalizations (range: 30% to 70%), a 63% reduction in antimicrobial drug use (range: 40% to 80%) and a 1-day reduction in lost work days under treatment (range: 0.5 to 1.5 days).⁽⁴⁾ No data on reductions in mortality caused by influenza due to oseltamivir treatment are currently available. In their impact analysis, Gani et al assumed that oseltamivir treatment would provide a 50% protection against death.⁽⁵⁾ This estimate was based on the assumption that a 50% protection against the more serious outcomes of influenza would translate to equivalent protection against death.

Evidence is limited on the effects of neuraminidase inhibitors in reducing the complications of influenza in individuals with co-morbid conditions that increase their risk of these complications. The available evidence supporting such a beneficial effect derives from analyses of pooled data from multiple independent studies.⁽⁶⁾ Both oseltamivir and zanamivir have similar effectiveness of 70-90% in preventing laboratory-confirmed influenza illness⁽⁷⁾.

Both oseltamivir and zanamivir were approved for use in Canada in 1999 for the treatment of infection due to influenza A or B. Since December 2003, oseltamivir has also been approved for influenza prophylaxis in Canada. Zanamivir is not currently approved for prophylaxis. Current evidence suggests that the development of resistance during treatment of influenza is less likely with neuraminidase inhibitors than with amantadine and any resistant viruses that develop are less likely to be transmissible. Neuraminidase inhibitors are more expensive than amantadine at this time.

Antiviral (Anti-Influenza) Drugs Currently Approved for Use in Canada

Drug	Trade name and Manufacturer	Class	Indications	Formulation(s)	Shelf Life/ Stability	Expected use(s) during pandemic
Oseltamivir	Tamiflu®, Hoffmann- La Roche Inc.	Neuraminidase Inhibitor	Treatment of influenza A and B in persons 1 year and older who have been symptomatic for no more than 2 days Prevention of influenza A and B in persons 1 year of age and older following close contact with an infected individual	Capsules (75 mg/capsule) 10 capsules per blister pack or bottles of 10 and 100 capsules Powder for oral suspension (12 mg/ml when reconstituted): 900 mg per bottle (volume of 75 ml in a 100-ml glass bottle)	Shelf life: 5 years Shelf life: 2 years Stability: Once reconstituted, 10 days in refrigerator (at 2 to 8 degrees Celcius)	Capsules for those presenting and requiring early treatment. Oral suspension for treatment of children weighing less than 40 kg and/or those who cannot swallow the capsules. No decision has been made at this time to use the drugs in the national stockpile for prophylaxis indications. It is recognized that outside of the national stockpile, stockpiling with the intent to use this drug for prophylaxis may have occurred.
Zanamivir	Relenza®, GlaxoSmithKline	Neuraminidase Inhibitor	Treatment of influenza A and B in persons 7 years of age and older who have been symptomatic for no more than 2 days	ROTADISK® consisting of a circular foil disk with four blisters each containing 5 mg of zanamivir. A DISKHALER® inhalation device is provided to administer the medication (through inhalation). One box contains 5 disks, which is equivalent to one treatment course.	Shelf Life: 2 years Stability: Once reconstituted, 10 days in refrigerator (at 2 to 8 degrees Celcius)	Treatment for those presenting and requiring early treatment with specific focus on pregnant and nursing women
Amantadine	Symmetrel® and Endantadine®- Bristol Myers Squibb Generic amantadine manufacturers: Dominion Pharmacal, GenPharm, Medican Pharma, Pharmel, Pharmascience	M2 Ion Channel Inhibitors (Cyclic Amines or Adamantanes)	Treatment of influenza A in persons 1 year of age and older Prevention of influenza A in persons 1 year of age and older	Capsules (100 mg/capsule): bottles of 100 capsules Syrup (10 mg/ml): bottles of 500 ml	Shelf Life: 3 years* Shelf Life 2 years	This drug has not been included in the national stockpile. It is recognized that it may be available at the time of a pandemic but should be used for prophylaxis only and only if the strain is known to be susceptible to amantadine.

* Note: In one study amantadine was found to be stable after 25 years of uncontrolled storage on the shelf (1). Stability of other antiviral drugs may also extend beyond the currently stated expiry date. If the currently stockpiled antivirals are not used by their respective expiry dates, stability testing will likely be implemented to determine whether the drugs are still expected to be effective and should be retained in the stockpile..

3.2 M2 Ion Channel Inhibitors (Cyclic Amines or Adamantanes)

M2 ion channel inhibitors (amantadine and rimantadine) interfere with the replication cycle of influenza A but are not effective against influenza B. Rimantadine is not currently approved for use in Canada.

Amantadine is approximately 70% to 90% effective in preventing illness from influenza A infection. When administered within 2 days of onset of illness, it can reduce the duration of uncomplicated influenza A illness by approximately 1 day, but it has not been studied as to its ability to reduce the complications of influenza. Resistance to amantadine has been shown to develop rapidly (in up to 30% of recipients) when this drug is used for treatment purposes and these resistant viruses are readily transmissible⁽⁸⁾.

The Antivirals Working Group has considered a potential role for amantadine or rimantadine. Their role in treatment is not supported. They could be used for prophylaxis during a domestic outbreak of avian influenza or during a pandemic if the novel virus is susceptible. However, in order to use rimantadine, which has fewer side effects than amantadine, special permission would need to be sought as it is not currently approved for use in Canada. Most of the H5N1 viruses have been found to be resistant to these drugs.

4.0 The National Antiviral Stockpile

4.1 Size of the National Antiviral Stockpile

Creation of a national stockpile helps ensure equitable access across Canada to a secure supply of antivirals for pandemic influenza, along with equitable access to these drugs through governmental control. The national antiviral stockpile was created in the fall of 2004 as a result of a joint federal and provincial and territorial (P/T) purchase of oseltamivir capsules. The initial quantity in the stockpile was 16 million doses, which was originally estimated to be sufficient to cover:

- 1) the early treatment of hospitalized patients, health care workers, public health and pandemic societal responders, key health decision makers, high-risk individuals in the community and residents of long-term care facilities experiencing outbreaks; and
- 2) 6 weeks of prophylaxis of one-third of all health care professionals in Canada (to cover frontline workers).

In the fall of 2005, the PIC Antivirals Working Group reviewed the assumptions used to derive the initial estimates and recommended changes to these assumptions*. The “modified scenario” that resulted from these adjusted assumptions (including a clinical attack rate of 25%, more severe impact in terms of morbidity, higher uptake of the drugs, and 50% for the proportion of “front-line” health care workers), would require substantially more drug to cover the groups previously expected to be covered by the 16M dose stockpile. These estimates led the working group to recommend to the Pandemic Influenza Committee (PIC) that the size of the stockpile be substantially increased. The working group also recommended expansion of treatment to everyone ill enough to need care, in line with the approach being taken in many other developed countries.

* Original assumptions used for antivirals needs estimate: Mild-moderate severity, 20% clinical attack rate, 6 weeks pandemic wave, 33% of health care workers are “front-line”.

At a joint meeting of the Council of Chief Medical Officers of Health (CCMOH) and the Public Health Network in February 2006, recommendations for the size, composition and use of the National Antiviral Stockpile were formalized. It was determined that the size (and diversity) of the stockpile should be increased to 55 million doses or 5.5 million treatment courses of neuraminidase inhibitors. Based on past pandemics, and reflected in the Flu-aid model developed in the U.S. by Meltzer et al, during mild-moderate pandemics approximately half of those who develop a clinical illness present for medical attention. With a clinical attack rate of 35% over the course of the pandemic, and half of the clinically ill seeking medical care, 55 million doses would be required (based on the current standard treatment course), assuming that all persons presenting for care require antivirals.

The national stockpile was distributed on a per capita basis to each of the P/Ts. Some P/Ts have chosen to purchase additional quantities of antivirals. At the time of publication, it is estimated that approximately 39 million doses (including the 16 million in the national stockpile) of oseltamivir have been stockpiled by the federal and P/T governments in Canada. If the government stockpiles that currently exist outside of the national stockpile are incorporated into the national stockpile, the target of 55 million doses could be achieved as early as spring 2007.

The content of the stockpile (i.e. number of doses and drugs) will be assessed on an ongoing basis as planning activities continue and additional science and resources (including drug supply) become available to further inform the antiviral strategy. The latest set of recommendations, specifically regarding the size of the National Antiviral Stockpile, are intended to assist planning and should not be interpreted as establishing the absolute requirements for an influenza pandemic.

4.2 Use of the National Antiviral Stockpile

Use of the initial 16 million dose national stockpile was originally anticipated to be a combination of treatment and prophylaxis indications which would have covered a limited number of the nationally agreed upon priority groups. With the expansion of the stockpile to 55 million doses, the strategy has been revised and is described below.

Early Treatment (i.e., treatment within 48 hours of symptom onset)

The National Antiviral Stockpile should be used at the time of a pandemic for early treatment of all persons with influenza-like illness (presumed pandemic influenza) who are ill enough to need care, and who are assessed within 48 hours of the onset of symptoms. At the time of implementation of the antiviral strategy prioritization may still be necessary, for example if treatment is found to require more than 10 doses or the stockpile is not yet completely built up. If prioritization for treatment is recommended at that time then the doses from the national stockpile would be used for those with ILI who are deemed to be most at risk of serious morbidity and mortality based on the available data.

There has been an accumulation of literature and modeling studies, particularly in the past year, to support a focus on early treatment (in contrast to prophylaxis) as the most efficient way to prevent hospitalizations and death in both high risk individuals and the general public. Based on the estimated impact of a pandemic, treatment with antivirals is expected to be cost-saving to the economy under several treatment strategies. One recent international study has shown therapeutic treatment and post-exposure prophylaxis both to be cost-saving, with a cost-benefit ratio of 2.44-3.68⁽⁴⁾. Canadian modeling is underway and early indications are that a treatment focused strategy is the most cost-effective strategy.

There are ethical obligations to provide effective treatment to persons who can benefit, through the timely administration of a safe and effective treatment that keeps harm (in this situation, the risk of complications of influenza), if not fully avoidable, at the lowest possible level. The principle challenge of a treatment-focused strategy is ability to deliver drugs in a timely manner to ill individuals. To be effective, neuraminidase inhibitors must be administered as early as possible, ideally within 12 hours after the start of illness but definitely within 48 hours. Delivery of the drugs is primarily the responsibility of the respective P/T and local governments. Since the current antiviral supplies have been allocated on a per capita basis, treatment courses should be provided through the local distribution point regardless of whether the individual has any ties to the federal system (e.g., lives on a First Nations reserve or is a federal government employee).

Prophylaxis

Both the Antivirals Working Group and PIC recognize that prophylaxis of health care workers, key decision makers and public health and societal responders (see Glossary for definitions) could contribute to the Canadian pandemic goals of minimizing serious illness and death, and societal disruption. Prophylaxis of health care workers could help keep the health care work force in place at a time of greatly increased need and help maintain an effective early treatment strategy for the general public. Unlike the situation during SARS, it is unclear whether health care workers will be at increased risk in the health care setting because of their use of infection control precautions and personal protective equipment. Health care workers are as likely as anyone else to be exposed in the community. Should their onset of illness occur while at work in the health care setting, they could expose vulnerable patients and residents in closed units, which could in turn lead to outbreaks. Control of influenza outbreaks in health care facilities is usually (during the annual influenza season) swiftly accomplished by antiviral prophylaxis of all residents and unvaccinated staff. During a pandemic similar availability of antivirals for outbreak control in these facilities would also be of value, likely providing significant benefits in terms of hospitalizations averted and lives saved.

It also must be recognized that beyond the goal of the Plan, there is also the goal of business continuity and optimal personal protection. Coupled with the efforts of governments and the private sector to build appropriate business continuity plans, the issue of supplying antivirals for prophylaxis has also been raised in this context.

Antiviral prophylaxis requires considerably more drug than early treatment. Four to five individuals could be treated with the amount of drug required to provide prophylaxis for one individual for a 6 week period. Implementation of a prophylaxis strategy has several challenges, including identification of eligible personnel, the need to adjust timing to local epidemiology, compliance, potential for drug diversion (e.g., to family members), and the requirement for off-label use of the drug (in the case of zanamivir).

At this time the recommended use of the National Antiviral Stockpile is for treatment only. However, a national process including citizen and stakeholder dialogue, is underway in order to inform future policy decisions regarding whether antivirals provided through the National Antiviral Stockpile should be used for prophylaxis and to whom, during the pandemic period. There are health care system, scientific, economic, societal/ethical, legal and policy considerations that must be explored. Any decision to include prophylaxis indications would require F/P/T consensus on whether the existing stockpile should be expanded for this purpose.

Containment

The role and impact of antivirals in preventing transmission and slowing down the spread of a novel influenza virus is unknown. The use of antivirals for this purpose is under discussion as part of containment measures during the Pandemic Alert Period.

4.3 Composition of the National Antiviral Stockpile

It is expected that when the 55 million dose stockpile is completed, it will be composed of approximately:

- 90% oseltamivir (2 million doses as oseltamivir solution)
- 10% zanamivir

Adding zanamivir to the stockpile provides an option against oseltamivir-resistant strains, allows for a more optimal treatment option for pregnant and nursing women and enhances security against supply disruptions by supporting two manufacturers. Oral oseltamivir suspension would be used for the treatment of children and adults or intubated patients that cannot swallow capsules. Although oral oseltamivir suspension has a relatively limited shelf-life (2 years from date of manufacture), at this time data are lacking on the effectiveness of oseltamivir capsules that have been opened and mixed with another substance (e.g., applesauce) to facilitate administration to children or adults that cannot swallow capsules. The decision to stock oral oseltamivir suspension on an ongoing basis will be reviewed pending the availability of data on alternative antiviral treatment options for children or individuals that cannot swallow capsules.

At this time there are no plans to include adamantanes in the national stockpile. Compared to the neuraminidase inhibitors, there is an increased likelihood of resistance to adamantanes from the outset. Ongoing monitoring of antiviral drug resistance suggests that there is no role for M2 inhibitors in the stockpile but that diversification within the NAI drug class would be beneficial.

5.0 Planning Principles and Key Recommendations

The Antivirals Working Group and PIC have made a number of recommendations regarding the antiviral strategy. The following list summarizes principles and key recommendations for planning purposes.

- a) The use of antivirals should be consistent with the goal or objective of the pandemic period (e.g., Interpandemic Period, Pandemic Alert Period, Pandemic Period).

Recommendations regarding the use of antiviral drugs during the different Canadian pandemic phases are included in the Public Health Measures annex (Annex M) and in the Response Section of the Plan. Use of these drugs during the Pandemic Alert Period is to support the objective of containment during this period. This includes treatment of cases and prophylaxis of close contacts when human to human transmission is occurring. During the pandemic period, antiviral use is intended to support the overall pandemic goals of minimizing serious illness and overall deaths, and secondly minimizing societal disruption among Canadians. Therefore antiviral drug use during the Pandemic Period is expected to follow the nationally-agreed strategy which currently focuses on early treatment.

- b) Neuraminidase inhibitors can be used for either treatment or prophylaxis of influenza. M2 ion channel inhibitors (e.g. amantadine) should be used only for prophylaxis and only if the strain is known to be susceptible.

The antiviral strategy focuses on the use of neuraminidase inhibitors as the drugs of choice for the treatment and prophylaxis of novel influenza viruses with pandemic potential and for the pandemic virus. When used for treatment, the neuraminidase inhibitors have been shown to be effective in preventing complications and hospitalization. They are also effective in preventing influenza. The emergence of drug resistance during treatment is less likely to occur than with amantadine where emergence of resistance occurs rapidly (and is already widespread among the H5N1 viruses). In addition, neuraminidase inhibitors are associated with fewer side effects than amantadine, thus facilitating compliance.

Zanamivir may be used as an alternative to oseltamivir, although it is not yet approved for prophylaxis in Canada. As the drug is inhaled, little is systemically absorbed; thus it may be preferred for pregnant and nursing mothers in order to minimize exposure of the fetus or young infant. Zanamivir may also remain effective should resistance develop to oseltamivir. One limitation, however, is that not all persons will be able to use the inhalation device successfully. Another limitation is that inhaled zanamivir would not be expected to be effective for treatment if the pandemic virus replicates systemically instead of just in the respiratory tract.

- c) Treatment with neuraminidase inhibitors should be initiated within 48 hours of symptom onset.

Since replication of influenza virus in the respiratory tract peaks between 24 and 72 hours after the onset of the illness, neuraminidase inhibitors (which act at the stage of viral replication) must be administered as early as possible. This is ideally within 12 hours after the start of illness but definitely within 48 hours. Because of the lack of evidence for benefit when antiviral drugs are started more than 48 hours from onset of illness, treatment should generally be restricted to those presenting within that time frame unless experience with the pandemic virus suggests otherwise. Due to the importance of early antiviral treatment in Canada's pandemic plan, clinical planning groups should consider ways to implement this strategy at a time of high numbers of clinically symptomatic individuals.

- d) The susceptibility of the novel strain to antiviral drugs (both during the Pandemic Alert Period and the Pandemic Period) should be monitored.

Monitoring for drug resistance is essential to ensuring that the antiviral drugs will have the desired effect and that resources are optimized. This will be carried out at the National Microbiology Laboratory. Detailed protocols are under development.

6.0 Outstanding Issues

There are a number of antiviral issues still to be addressed including:

- F/P/T consensus on inclusion or exclusion of prophylactic indications.
- Updating the clinical guidelines for the use of antivirals
- Development of communication materials for health care providers and the public on the appropriate use of antiviral drugs, for circulation prior to a pandemic
- Guidelines for delivery and administration of antivirals including security, monitoring of drug distribution, uptake and wastage (mainly a P/T level activity)
- Use of diagnostic tests in guiding antiviral treatment
- Protocol for monitoring antiviral drug resistance

- Review of the adverse reaction reporting and monitoring system to identify the need for any pandemic enhancements, such as timeliness and capacity for rapid analysis, investigation and dissemination of information
- Modeling the impact and cost benefit of different strategies for the use of antiviral drugs
- Ongoing considerations of the optimal antiviral strategy and deployment based on new scientific developments (including modeling studies)
- Protocols for monitoring the shelf life of the antiviral stockpiles
- Considerations of potential off-label use of antivirals

There are also outstanding research issues including:

- Safety and effectiveness of antivirals for the treatment and prophylaxis of children under the age of 1 year and select high-risk groups, such as pregnant women, immunocompromised persons, elderly with underlying disease
- Safety and effectiveness of prolonged prophylaxis
- More robust data for effectiveness of neuraminidase inhibitors in reducing complications, hospitalization and mortality
- Minimum effective dose and duration of treatment for complicated and uncomplicated influenza caused by the pandemic strain
- Use of combination therapy in different populations
- Improved diagnostic tests
- Effect of antiviral administration on the response to live attenuated influenza vaccines
- Mechanism for resistance to both classes of antivirals and assessment of the biological consequences (e.g. infectiousness, virulence) of resistance
- Development of new antiviral drugs

At a national Influenza Research Priorities Workshop held in the summer of 2005, research aimed at the development and use of antivirals in the treatment of individuals with influenza and in the prevention of infection was identified as a priority. This included studies of novel approaches with existing antiviral medications as well as research aimed at the development and evaluation of new antiviral agents. The Public Health Agency of Canada and the Canadian Institutes of Health Research will be holding follow-up consultations on how best to coordinate and fund this research. Other countries have held similar influenza research priority meetings and recently the World Health Organization has indicated its intent to map out a global strategy and work plan for coordinating antiviral and vaccine research.

Some of the important questions about effective treatment protocols can only be answered when the pandemic strain emerges. Rapid clinical trials will be critical to guide the most appropriate use of antiviral drugs. In Canada, an Emerging Infectious Diseases Research Network has been established to bring together government and University researchers ahead of a mass emergency so that research studies can be launched rapidly during a pandemic. As its work progresses, the advance development of research protocols and mechanisms for rapid ethical approval will help address these concerns.

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Infection Control and Occupational Health Guidelines During Pandemic Influenza in Traditional and Non-Traditional Health Care Settings

Date of Latest Version: June 2006

Summary of Significant Changes:

- Updated to include recommendations (and related references) regarding ventilation standards for health care facilities, and information regarding the spatial separation of patients in different settings;
- Uses new Pandemic Phase terminology;
- Recommendations regarding monitoring vaccinated visitors for ILI have been clarified;
- Section on Public Health Measures has been deleted from Annex F as there is now a separate Annex on this topic.

Note: Section on the mode of transmission of influenza and required control measures will be updated. Further review of existing literature is ongoing, and a consensus conference of experts in influenza transmission and control and respiratory protection is planned to assist in resolution of these two controversial issues.

Addition: April 2007

Inclusion of Infection Control Guideline Recommendation on the Use of Respirators for Aerosol Generating Medical Procedures on Patients with Known or Suspected Influenza Caused by the Pandemic Strain

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Notification

Canadian Pandemic Plan October 5th, 2006

The February 2004 Infection Control and Occupational Health Guidelines During Pandemic Influenza in Traditional and Non-Traditional Health Care Settings, Annex F of the Canadian Pandemic Plan is under revision.

Stakeholders should be advised that the document has been updated to include recommendations (and related references) regarding ventilation standards for health care facilities and information has been provided regarding the spatial separation of patients in different settings. In addition, terminology and statements regarding antiviral availability have been revised to be consistent with other sections of the Plan. Some terms in the glossary have been clarified and the phases were updated according to the revised World Health Organization phases. Recommendations regarding monitoring vaccinated visitors for ILI (as opposed to not monitoring staff or visitors who have recovered from pandemic influenza) have been clarified. The Section on Public Health Measures has been deleted from Annex F as there is now a separate Annex on this topic.

The section on the mode of transmission of influenza and required control measures has not been finalized. Annex F states that the primary modes of transmission of influenza virus are large respiratory droplets and contact, direct and indirect. The contribution of airborne transmission to the spread of influenza virus is controversial. The Infection Control Guidelines Steering Committee of the Public Health Agency of Canada therefore recommends that, in addition to hand hygiene, the appropriate personal protective equipment to be worn while caring for patients with influenza is a mask (good quality surgical type), eye protection, gloves and gown. The requirement for N95 respirators during aerosol generating procedures on patients with influenza is controversial. Further review of existing literature is ongoing, and a consensus conference of experts in influenza transmission and control and respiratory protection is planned to assist in resolution of these two controversial issues. The new version of Annex F is expected to be completed following the Influenza Infection Prevention and Control Consensus meeting to be held on October 26th and 27th 2006.

Executive Summary

The Infection Control and Occupational Health Guidelines During Pandemic Influenza in Traditional and Non-Traditional Health Care Settings have been prepared by Health Canada's Nosocomial and Occupational Infections Section from the Centre for Infectious Disease Prevention and Control. These guidelines are one of the annexes of the Canadian Pandemic Influenza Plan.

These guidelines are designed to assist those responsible for managing pandemic influenza in traditional and non-traditional health care settings. Traditional health care settings include acute, long term, ambulatory and community care. Non-traditional health care settings are those settings that are designated for operation prior to an influenza pandemic and become operational only when an influenza pandemic is declared by the World Health Organization (WHO). Non-traditional settings include triage settings, self care settings and temporary influenza hospitals. Organizations that assume responsibility for non-traditional settings are referred to as "parent organizations" in

this document. If there is no “parent” organization to plan or operate the non-traditional setting, it is expected another organization would assume this role. Public Health may be in the best position to plan or operate such facilities, although this would need to be negotiated and corroborated.

This document presents an overview of infection prevention and control policies and procedures that will be critical to minimize the transmission of pandemic influenza, with or without the availability of immunization or chemoprophylaxis, and for preventing other infectious diseases. Therefore, the Infection Control and Occupational Health Guidelines During Pandemic Influenza in Traditional and Non - Traditional Health Care Settings are based on previously published Health Canada infection control guidelines. It is recognized that certain recommendations may be feasible only in the early phases of the pandemic as they may not be achievable as the pandemic spreads and resources become scarce. Part A describes a foundation to develop an infection control/ occupational health (IC/OH) plan for the management of pandemic influenza with particular focus on influenza transmission, routine practices, pandemic influenza education and public health restrictions. Major attention is given to the management of health care workers during an influenza pandemic. Recommendations for the use of influenza vaccine and antivirals for health care workers (HCWs) and patients are not included in these guidelines because they are fully outlined in the vaccine and antiviral annexes (Annexes D and E) of the Canadian Pandemic Influenza Plan.

Part A also explains the lack of evidence to support the use of masks to prevent transmission of influenza during previous pandemics. The evidence shows that, in the early phase of an influenza pandemic, it may be prudent for HCWs to wear masks when interacting in close face-to-face contact with coughing individuals to minimize influenza transmission. This use of masks is advised when immunization and antivirals are not yet available but is not practical or helpful when transmission has entered the community. Masks may be worn by HCWs to prevent transmission of other organisms from patients with an undiagnosed cough. For the purpose of this document, the term mask refers to surgical masks, not to special masks such as high efficiency dust/mist masks or respirators.

Hand Hygiene is emphasized throughout the guidelines because strict adherence to handwashing/ hand antiseptic recommendations is the cornerstone of infection prevention. Proper hand hygiene may be the only preventative measure available during a pandemic.

Part B describes the Management of Pandemic Influenza in traditional settings. Acute care, long term care, ambulatory care and individual community settings are stand-alone sections and are designed to be used in conjunction with Part A to develop an IC/OH plan for the management of pandemic influenza. References to published guidelines are frequent because it is expected that personnel in traditional health care settings are well acquainted with the series of infection control guidelines published by Health Canada.

Part C outlines the Management of Pandemic Influenza in non-traditional settings. Triage, self care setting and temporary influenza hospitals are stand alone sections and are designed to be used in conjunction with Part A to develop an IC/OH plan for the management of pandemic influenza. Detailed recommendations, adapted from published infection control guidelines, are provided for non-traditional settings as the planning and operation of such settings will be a novel situation.

Appendix I. The “Guideline Rating System” describes the system of ranking the strength of the evidence used to support the recommendations made in these guidelines.

Appendix II. The “World Health Organization Pandemic Influenza Phases” is the outline of the staged plan for responding to a pandemic threat and is based on the WHO influenza surveillance program.

Appendix III. The “Hand Hygiene Procedures”, A. How to Wash Hands and B. Decontaminating Hands with an Alcohol-based Hand Rub provide specific details related to hand hygiene.

Appendix IV. An “Influenza-Like-Illness (ILI) Assessment Tool” is provided to assist with immediate triage of patients or staff and accommodation/cohort of patients, prior to further OH or clinical management. This ILI triage tool should not be used for clinical management. Clinical management is specified in the “Clinical Care Guideline and Tools” annex of the Canadian Pandemic Influenza Plan.

Appendix V. Table A, “Cleaning Procedures for Common Items” provides examples of how common items are cleaned. Table B, “Directions for Preparing and Using Chlorine Bleach” describes recommendations for dilutions of specific products and their intended use.

These guidelines do not discuss interpandemic influenza. Infection control and occupational health recommendations for interpandemic influenza are addressed in other Health Canada guidelines, specifically in the Infection Control Guidelines for the Prevention of Health Care-Associated Pneumonia., currently being developed.

Infection Control Guideline Recommendation on the Use of Respirators for Aerosol Generating Medical Procedures¹ on Patients with Known or Suspected Influenza Caused by the Pandemic Strain

The Infection Control Guideline Steering Committee makes the following recommendation on the use of masks and respirators for Aerosol Generating Medical Procedures¹ performed on patients with suspected or known influenza caused by the pandemic strain.

When performing or assisting with a planned or urgent aerosol generating medical procedure¹ on a patient with known or suspected influenza caused by the pandemic influenza strain, all health care workers² in the room should wear a submicron particulate respirator³ that forms a tight facial seal, (e.g., N95 NIOSH approved respirator – appropriately fit-tested⁴ and fit-checked.)

Laboratory specimens and isolates from patients with known or suspected pandemic influenza should be handled according to Health Canada’s (now Public Health Agency of Canada) Laboratory Biosafety Guideline, 3rd edition, 2004.

This statement is to address the present gap in Annex F that did not make a recommendation on Personal Protective Equipment for Aerosol Generating Medical Procedures¹.

This statement is an additional measure, not a replacement, to all other Infection Control recommendations found in Annex F. As stated in the present Annex F, eye protection or face shields should be used along with the respirator.

Definitions and Notes:

- 1 Aerosol Generating Medical Procedure:** A medical or surgical procedure that involves manipulation or stimulation of a patient’s airway in a manner that may stimulate coughing and/or promote the generation of aerosols.
- 2 Health Care Worker:** Health care workers are professionals, including trainees and retirees, nonprofessionals and volunteers, involved in direct patient care; and/or those working/volunteering in designated health care facilities or services. For the purposes of this definition, HCWs are those whose functions are essential to the provision of patient care, and who may have the potential for acquiring or transmitting infectious agents during the course of their work.
- 3 Sub Micron Particulate Respirator:**
 - Bacterial Filtration Efficiency (BFE) of 95% or greater, as per ASTM Standard F2101.
 - Particulate Filtration Efficiency (PFE) of 95% or greater, as per ASTM Standard F2299.
- 4** Fit-testing procedures and frequency should be in accordance with provincial occupational health and safety standards or where not specifically defined, at minimum, should follow CSA Z94.4-02: Selection, Use and Care of Respirators. CSA: 2002.

A full revision of Annex F is in progress, under the direction of the Infection Control Guidelines Steering Committee. The Annex F working group includes representatives from the infection control, public health, laboratory, home care and occupational health and safety communities.

Glossary of Terms

Antiseptic hand rub	A waterless, antiseptic hand rub product that is applied to all surfaces of the hands to reduce the number of microorganisms present ¹ .
Biomedical waste	Defined by the Canadian Standards Association as waste that is generated by human or animal health care facilities, medical or veterinary settings, health care teaching establishments, laboratories, and facilities involved in the production of vaccines ³ .
Cleaning	The physical removal of foreign material, e.g., dust, soil, organic material such as blood, secretions, excretions and microorganisms. Cleaning physically removes rather than kills microorganisms. It is accomplished with water, detergents and mechanical action. In certain settings, (e.g., central service or dietetics), the terms decontamination and sanitation may be used for this process. Cleaning reduces or eliminates the reservoirs of potential pathogenic organisms. Cleaning agents are the most common chemicals used in housekeeping activity ³ .
Cohort	Two or more patients exposed to, or infected with, the same organism who are separated physically (e.g., in a separate room or ward) from other patients who have not been exposed to, or infected with, that organism ⁴ .
Cohort staffing	The practice of assigning specific personnel to care only for patients/residents known be exposed to, or infected with, the same organism. Such personnel would not participate in the care of patients/residents who have not been exposed to, or infected with, that organism ⁴ .
Contact transmission	Includes direct contact, indirect contact and droplet transmission as described below ⁵ : <ul style="list-style-type: none">• Direct contact occurs when the transfer of microorganisms results from direct physical contact between an infected or colonized individual and a susceptible host (body surface to body surface).• Indirect contact involves the passive transfer of microorganisms to a susceptible host via an intermediate object such as contaminated hands that are not washed between patients, contaminated instruments or other inanimate objects in the patient's immediate environment.
Critical items	Instruments and devices that enter sterile tissues, including the vascular system. Critical items present a high risk of infection if the item is contaminated with any microorganism, including bacterial spores. Reprocessing critical items, such as surgical equipment or intravascular devices, involves meticulous cleaning followed by sterilization ³ .
Droplet	Refers to large droplets, greater than or equal to 5 µm in diameter, generated from the respiratory tract of the source patient during coughing or sneezing, or during procedures such as suctioning or bronchoscopy. These droplets are propelled a short distance, less than 1 meter, through the air and deposited on the nasal or oral mucosa of the new host.

Decontaminate hands	The reduction of bacterial counts on hands is accomplished by performing an antiseptic hand rub or antiseptic hand wash ¹ .
Decontamination	The removal of disease-producing microorganisms to leave an item safe for further handling ³ .
Disinfection	The inactivation of disease-producing microorganisms. Disinfectants are used on inanimate objects; antiseptics are used on living tissue. Disinfection does not destroy bacterial spores. Disinfection usually involves chemicals, heat or ultraviolet light. Levels of chemical disinfection vary with the type of product used ³ .
Exposure	The condition of being subjected to a microorganism or an infectious disease in a manner that enables transmission to occur ⁶ .
Fit for Work	<p>Terminology used in occupational health to communicate a worker's ability to remain at or return to work. This ability includes three categories: fit for work, unfit for work, fit with restrictions. This categorization allows the occupational health nurse to maintain confidentiality about a worker's diagnosis, symptoms, immune status, etc.⁶</p> <ul style="list-style-type: none"> ▪ Fit for Work - Fit to work with no restrictions ▪ Unfit for Work – Defined as a restriction from patient care tasks, co-worker contact and restriction from the workplace. ▪ Fit for work with restrictions - Allows for the re-assignment of duties or re-integration into the workplace in a manner that will not pose an infection risk to the HCW or to the patients and or other individuals in the workplace.
Hand antisepsis	This term refers to either antiseptic handwash or antiseptic handrub ¹ . A process for the removal or reduction of resident and transient microorganisms ³ .
Hand hygiene	A general term that applies either to handwashing, an antiseptic handwash, an antiseptic hand rub, or a surgical hand antisepsis ¹ .
Handwashing Washing	hands with plain (i.e., non-antimicrobial) soap and water ¹ . A process for the removal of soil and transient microorganisms from the hands ³ .
Health Care Worker (HCW)	HCWs are professionals, including trainees, and retirees, nonprofessionals and volunteers, involved in direct patient care; and/or those working/volunteering in designated health care facilities or services. For the purposes of this definition, HCWs are those whose functions are essential to the provision of patient care, and who may have the potential for acquiring or transmitting infectious agents during the course of their work.
High level disinfection	<p>This term refers to the level of disinfection required when processing semicritical items.</p> <p>High level disinfection processes destroy vegetative bacteria, mycobacteria, fungi and enveloped (lipid) and non-enveloped (non-lipid) viruses, but not necessarily bacterial spores. High level disinfectant chemicals (also called chemosterilants) must be capable of sterilization when contact time is extended. Items must be thoroughly cleaned prior to high level disinfection³.</p>
Infectious waste	The portion of biomedical waste that is capable of producing infectious disease.

Influenza

Clinical Case Definition of Influenza

When influenza is circulating in the community, the presence of fever and cough of acute onset are good predictors of influenza. The positive predictive value increases when fever is higher than 38°C and when the time of onset of the clinical illness is acute (less than 48 hours after the prodromes). Other symptoms, such as sore throat, rhinorrhea, malaise, rigors or chills, myalgia and headache, although unspecific, may also be present¹.

Confirmed Case of Influenza

Confirmed cases of influenza are those with laboratory confirmation (i.e., virus isolation from respiratory tract secretions, identification of viral antigens or nucleic acid in the respiratory tract, or a significant rise in serum antibodies) or clinical cases with an epidemiological link to a laboratory confirmed case⁷.

Influenza-Like-Illness (ILI)

For surveillance purposes, the ILI definition currently used in Canada says:

- Acute onset of respiratory illness with fever (>38°C) and cough and with one or more of the following: sore throat, arthralgia, myalgia or prostration, which could be due to influenza virus as used by the National Influenza Surveillance Program (FluWatch) for the 2002-2003 season⁸.

Intermediate level disinfection

The level of disinfection required for some semicritical items. Intermediate level disinfectants kill vegetative bacteria, most viruses and most fungi but not resistant bacterial spores³.

Low level disinfection

The level of disinfection required when processing noncritical items or some environmental surfaces. Low level disinfectants kill most vegetative bacteria and some fungi as well as enveloped (lipid) viruses (e.g., hepatitis B, C, Hantavirus, and HIV). Low level disinfectants do not kill mycobacteria or bacterial spores. Low level disinfectants-detergents are used to clean environmental surfaces³.

Mask

A barrier covering the nose and mouth to protect the mucous membranes from microorganisms contained in large droplet particles (> 5 µm in size) generated from a source person during coughing, sneezing, or talking and during the performance of certain procedures that generate droplets (e.g., suctioning) or are likely to generate splashes or sprays of blood, body fluids, secretions, or excretions. Masks may also be used to contain large droplet particles generated by coughing or sneezing persons. The term mask in this document refers to surgical masks, not to special masks, such as high efficiency dust/mist masks or respirators.

Noncritical items

Items that either touch only intact skin but not mucous membranes or do not directly touch the patient/resident/client. Reprocessing of noncritical items involves cleaning and or low level disinfection³.

Non traditional health care settings

Non-traditional health care settings are those settings that are predetermined for operation prior to an influenza pandemic and operational only when an influenza pandemic is declared by the World Health Organization (WHO).

Plain soap

Products that do not contain antimicrobial agents, or contain very low concentrations of antimicrobial agents that are effective solely as preservatives¹.

Parent organization

The organization responsible for the planning of a non-traditional setting operational only in the event of the declaration of an influenza pandemic. When there is no specific organization, another organization must be identified to assume the role of the parent organization.

Personal protective equipment	Attire used by the worker to protect against airborne or droplet exposure and exposure to blood and bloody body fluids, i.e., masks, eye goggles, face shields, gloves and gowns ⁵ .
Precautions	Interventions implemented to reduce the risk of transmission of microorganisms from patient-to-patient, patient to health care worker, and health care worker to patient ⁵ .
Semicritical items	Devices that come in contact with nonintact skin or mucous membranes but ordinarily do not penetrate them. Reprocessing semicritical items involves meticulous cleaning followed preferably by high-level disinfection ³ .
Sterilization	The destruction of all forms of microbial life including bacteria, viruses, spores and fungi. Items must be cleaned thoroughly before effective sterilization can take place ³ .
Traditional health care setting	Traditional settings include acute, long term, ambulatory and community care.

Overview of Pandemic Influenza

1.0 Background Information

The following document provides infection prevention and control guidance for the management of pandemic influenza in traditional and non-traditional health care settings. Non-traditional health care settings are those that are predetermined for operation prior to an influenza pandemic and operational only when an influenza pandemic is declared by the World Health Organization (WHO).

Infection prevention and control guidelines for interpandemic influenza in traditional health care settings, (i.e., acute care, long-term care, ambulatory care and community care), will be addressed in other Health Canada infection control guidelines, specifically the Guideline for the Prevention of Health Care-Associated Pneumonia.

Infection prevention and control guidelines for the management of pandemic influenza in traditional and non-traditional health care settings are based on previously published Health Canada Infection Control Guidelines^{3,5,6,9}. Although recommendations to prevent the transmission of infection during the delivery of health care, including during a pandemic are important, it is recognized that certain recommendations may be feasible only in the early phases of the pandemic as they may not be achievable when the pandemic spreads and resources become scarce. For the purpose of this document the term mask refers to surgical masks, not to procedure masks, special masks or respirators.

Throughout this document, the term “parent organization” refers to the organization that assumes responsibility for non - traditional settings. Where there is no “parent” organization to plan or operate the non - traditional settings, it is expected that another organization would assume this role. Public Health may be in the best position to plan or operate such facilities although this would need to be negotiated and corroborated.

In this document, individuals who have recovered from or have been vaccinated against the pandemic strain of influenza are considered immune with one important caveat regarding the immune status of the vaccinated individual. Because influenza vaccines are not 100% efficacious, if vaccinated individuals come in contact with influenza patients, the vaccinated individual should be monitored for ILI using the ILI Assessment Tool found in Appendix IV. Health Canada will coordinate studies on vaccine effectiveness (see the vaccine annex [Annex D] in the Canadian Pandemic Influenza Plan for further details).

During a pandemic, it may be necessary to recruit trainees and volunteers to take on specific responsibilities, for example, basic patient care, that is usually reserved for health care workers. The implication is that these workers will need to be considered, for infection control purposes, as being equivalent to health care workers (see glossary) in terms of risk of exposure and ability to transmit disease.

1.1 World Health Organization Phases for Pandemic Influenza

The World Health Organization has developed a staged plan, based on its surveillance program, for responding to a pandemic threat. Recognition of a novel influenza strain in humans triggers a series of responses, identified as phases and levels within phases that can ultimately lead to the declaration of a pandemic. Interpandemic activities are designated as Phase 0. Isolation of a novel virus subtype from a single human case, without evidence of spread, will result in WHO declaring pandemic influenza Phase 0: Preparedness Level 1. Phase 1 is the confirmation of a pandemic, Phase 3 is the end of the first pandemic wave and Phase 4 is the second or subsequent waves of the pandemic¹⁰.

More than one wave of infection can occur in a pandemic¹¹ possibly due to seasonal influences and the existence of a large pool of susceptible individuals in the population¹². Key stages of the WHO response are outlined in Appendix II.

2.0 Principles of Influenza Transmission

The following section has been adapted from the Health Canada Infection Control Guidelines *Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care*, 1999⁵.

Modes or routes of transmission of infectious agents have been classified as contact, droplet, airborne, common vehicle and vectorborne. Routes pertinent to influenza are contact, droplet and airborne.

2.1 Contact Transmission

Includes direct contact, indirect contact and droplet (large droplet transmission). Routine practices should prevent most transmissions by the contact route. Although droplet transmission is a type of contact transmission, it is considered separately as it requires additional precautions.

- **Direct Contact** Transmission occurs when the transfer of microorganisms results from direct physical contact between an infected or colonized individual and a susceptible host.
- **Indirect Contact** involves the passive transfer of microorganisms to a susceptible host via an intermediate object such as contaminated hands that are not washed between patients or contaminated instruments or other inanimate objects in the patient's immediate environment.

2.2 Droplet Transmission

Refers to large droplets, greater than or equal to 5 µm in diameter, generated from the respiratory tract of the source (infected individual) during coughing or sneezing, or during procedures such as suctioning or bronchoscopy. These droplets are propelled a distance of less than one meter through the air and are deposited on the nasal or oral mucosa of the new host (newly infected individual) or in the immediate environment. These large droplets do not remain suspended in the air, therefore, special ventilation is not required since true aerosolization (see below) does not occur.

2.3 Airborne Transmission

Refers to the dissemination of microorganisms by aerosolization. Organisms are contained in droplet nuclei, airborne particles less than 5 µm that result from the evaporation of large droplets, or in dust particles containing skin squames and other debris that remain suspended in the air for long periods of time¹³. Such microorganisms are widely dispersed by air currents and inhaled by susceptible hosts who may be some distance away from the source patients or individuals, even in different rooms or hospital wards. Control of airborne transmission is the most difficult as it requires control of air flow through special ventilation systems.

2.4 Evidence for the Mode of Influenza Transmission

The following section has been adapted from the Health Canada Infection Control Guidelines *Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care*, 1999⁵.

Organisms, especially respiratory viruses expelled in large droplets, remain viable in droplets that settle on objects in the immediate environment of the patient. Both influenza A and B viruses have been shown to survive on hard, non-porous surfaces for 24-48 hours, on cloth paper and tissue for 8-12 hours and on hands for 5 minutes¹⁴. The virus survives better at the low relative humidity encountered during winter in temperate zones.

Contact with respiratory secretions and large droplets, appears to account for most transmissions of influenza. In a report of an outbreak in a nursing home, the pattern of spread was suggestive of contact rather than airborne transmission because patients who were tube fed or required frequent suctioning had higher infection rates than those who did not require such care¹⁵.

Whether or not influenza is naturally transmitted by the airborne route is controversial^{16,17}. An outbreak of influenza on an airliner has been attributed to airborne spread; however, large droplet spread could have been responsible because the passengers were crowded together and moved about for several hours in a small, grounded airplane¹⁸. Although experimental airborne transmission of influenza A virus to mice has been reported, there is no evidence of such transmission in humans¹⁹.

2.4.1 Mode of Influenza Transmission

Influenza is directly transmitted primarily by droplet contact of the oral, nasal, or possibly conjunctival mucous membranes with the oropharyngeal secretions of an infected individual. Influenza is indirectly transmitted from hands and objects freshly soiled with discharges of the nose and throat of an acutely ill and coughing individual⁶.

2.5 Routine Practices and Additional Precautions to Prevent the Transmission of Influenza

The following section has been adapted from the Health Canada Infection Control Guidelines *Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care*, 1999⁵.

Routine practices outline the importance of handwashing before and after caring for patients; the need to use gloves, masks/eye protection/face shields, and gowns when splashes or sprays of blood, body fluids, secretions or excretions are possible; the cleaning of patient-care equipment,

the patient's physical environment and soiled linen; the precautions to reduce the possibility of HCW exposure to bloodborne pathogens and patient placement. Routine practices are the infection prevention and control practices for use in the routine care of all patients at all times in all health care settings.

Additional precautions are required when routine practices are not sufficient to prevent transmission. In interpandemic years, the Health Canada guidelines recommend that in addition to routine practices, which should be taken for the care of all patients, additional precautions (droplet and contact precautions) should be taken for pediatric⁵ and adult patients with influenza (personal communication, Consensus Meeting for infection control measures with patients presenting with acute, respiratory illness, Gatineau, Quebec, November 24, 2003). This recommendation represents a change because, in the past, it was unclear as to whether or not additional precautions were indicated for adults with influenza.

Children and adults who have the physical and cognitive abilities, should be encouraged to practice good hygiene: i.e., use disposable, one-use tissues for wiping noses; cover nose and mouth when sneezing and coughing; hand washing/hand antisepsis after coughing, sneezing or using tissues; and, keep hands away from the mucous membranes of the eyes and nose. Therefore, preventing the transmission of influenza is best achieved through strict compliance with routine practices, (i.e., good hygiene) and the use of additional precautions⁵.

Routine practices and additional precautions to prevent the transmission of infection during the delivery of health care in all health care settings during a pandemic are important. Certain routine practice and additional precaution recommendations may be feasible only in the early phases of the pandemic as they may not be achievable as the pandemic spreads and resources (equipment, supplies and workers) become scarce. Because the complexity of managing high risk patients will be greatest in acute care hospitals, it seems reasonable that the highest priority for infection control resources should be given to the acute care settings.

Strict adherence to hand washing/hand antisepsis recommendations is the cornerstone of infection prevention and may be the only preventive measure available during a pandemic. Hand hygiene procedures should be reinforced according to Appendix III.

2.6 Use of Masks During a Pandemic

Although there is a lack of evidence that the use of masks prevented transmission of influenza during previous pandemics; in the early phase of an influenza pandemic, it may be prudent for HCWs to wear masks when interacting in close face-to-face contact with coughing individuals to minimize influenza transmission. This use of masks is advised when immunization and antivirals are not yet available but is not practical or helpful when pandemic influenza has entered the community. There is no evidence that the use of masks in general public settings will be protective when the virus is circulating widely in the community.

Masks may be worn by HCWs to prevent transmission of other organisms from patients with undiagnosed cough. For the purpose of this document the term mask refers to surgical masks, not to special masks or respirators. Special masks, i.e., high-efficiency dust/mist masks are required for patients with infectious tuberculosis and for non-immune HCWs entering the room of a patient with measles or disseminated varicella.

When using surgical masks⁵:

- They should be used only once and changed if wet (because masks become ineffective when wet).
- They should cover both the nose and the mouth.
- Avoid touching it while it is being worn

- Discard them into an appropriate receptacle.
- They must not be allowed to dangle around the neck.

2.7 Infectivity of the Influenza Virus

The incubation period for influenza is from 1-3 days. The period of communicability (duration of viral shedding) continues for up to 7 days after the onset of illness⁵, probably from 3-5 days from clinical onset in adults and up to 7 days in children²⁰.

Individuals infected with influenza tend to shed more virus in their respiratory secretions in the early stages of the illness^{21,22} and patients are most infectious during the 24 hours before the onset of symptoms and during the most symptomatic period²³. Viral shedding may be longer in infants⁵, and prolonged in young children and immunodeficient patients²⁰. It has not been well established whether elderly long term care residents shed viruses longer than other adult populations²⁴.

There is no information to determine if the period of communicability will be different with pandemic influenza. The duration of shedding of a novel virus (pandemic strain) is unknown. It is possible that prolonged shedding could occur with pandemic influenza because the immune system would not have had prior experience with related strains²⁵.

Hands can be contaminated with influenza virus by contact with inanimate surfaces or objects in the immediate environment of a patient with influenza infection. Influenza A and B viruses have been shown to survive for 24-48 hours on hard, nonporous surfaces; for up to 8 to 12 hours on cloth, paper and tissues; and on hands for up to 5 minutes after transfer from environmental surfaces¹⁴.

“The influenza virus is readily inactivated by hospital germicides, household cleaning products, soap, hand wash or hand hygiene products.” Therefore, neither antiseptic hand wash products in health care settings nor antibacterial hand wash products in home setting are required because routine products, along with proper hand washing procedures, will inactivate the influenza virus.

Infectivity of the Influenza Virus	
1. Incubation period:	1-3 days.
2. Period of communicability:	Infectious 1 day before onset of symptoms and may be longer than 7 days after the onset of symptoms.

3.0 Occupational Health and Infection Control Management of Pandemic Influenza in Traditional and Non-traditional Health Care Settings

3.1 Occupational Health and Infection Control Pandemic Influenza Planning

A broad consensus has emerged regarding plans for pandemic influenza: the plans should be aimed at reducing influenza-related morbidity, mortality and social disruption. It is widely recognized that preparation for the next pandemic requires that an infrastructure be in place during the interpandemic period for the following reasons:

- a) the rapid detection of novel variants and disease caused by them,
- b) the production and delivery of influenza vaccines and antiviral agents to high priority target groups,
- c) the rapid dissemination and exchange of information; and
- d) emergency preparedness.

Pandemic plans should outline the responsibilities of the institutions that will be involved in the pandemic response. The plan should be divided into phases that describe, in detail, a step-wise response to the identification and subsequent spread of a novel virus, as well as the ability to cut back the response if a novel virus fails to spread as occurred in 1976 and 1977¹⁰.

Planning for and the management of pandemic influenza is directly related to the strength of the strategy in place for the management of interpandemic influenza; a strong interpandemic plan will affect the outcome of the pandemic plan¹².

“The trends of modern society, including the increasing availability of rapid human transportation and the urbanization of the rapidly expanding human population, tend to facilitate the spread of influenza and increase morbidity. Modern medicine can reduce the mortality that resulted from complications of infection with influenza virus during earlier epidemics, but the cost of medical interventions has increased to the point that effective methods of epidemic control should be considered. **This challenge provides an opportunity to develop, test, and have in place a strategy for control of interpandemic influenza before the next pandemic**”¹².

During an influenza pandemic, adherence to infection prevention and control policies and procedures is critical to minimize the transmission of influenza and other infectious diseases. It is anticipated that neither influenza immunization nor chemoprophylaxis will be available in the early stages of a pandemic and perhaps not even available in later stages, necessitating an emphasis on infection prevention and control practices.

3.1.1 Recommendations

1. All organizations responsible for traditional health care settings (i.e., acute, long term, ambulatory, home and community care) and organizations (i.e., parent organizations) responsible for the planning of non-traditional settings (i.e., triage settings, self care settings and temporary influenza hospitals) operational only during an influenza pandemic, should develop an Infection Control and Occupational Health (IC/OH) plan for the management of pandemic influenza. The plan should be developed according to previously published Health Canada Infection Control Guidelines^{3,5,6,9} and federal/provincial/territorial/municipal/regional contingency plans with a multi-disciplinary group that includes, but is not limited to:

a) representatives from traditional and non traditional organizations including:

- medical administration
- nursing administration
- physicians
- nursing services
- physical plant and housekeeping
- occupational health
- infection prevention and control
- pharmacy services
- emergency services
- respiratory services

- public affairs
 - educational services
 - laboratory services;
- b) public health personnel;
- c) community care providers;
- d) local pandemic planners;
- e) funeral service workers;
- f) local disaster planners.

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2. Non traditional settings that are not associated with a “parent” organization must develop their IC/OH plan for the management of pandemic influenza with an organization that would assume this role of “parent” organization. Public Health may be in the best position to plan or operate such facilities although this would need to be negotiated and corroborated.

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3. The IC/OH plan for the management of pandemic influenza for traditional and non-traditional settings should be reviewed every 3 years and updated according to current legislation and relevant publications.

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4. The IC/OH plan for the management of pandemic influenza for traditional and non-traditional settings should include the preparation of educational information for health care workers (see glossary for HCW definition, see section 4.1 for HCW education and see section 3.5 for management of HCWs during a pandemic).

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5. The IC/OH plan for the management of pandemic influenza should include recommendations for the use of influenza vaccine and chemoprophylaxis for health care workers according to the vaccine (Annex D) of the Canadian Pandemic Influenza Plan.

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6. Pandemic influenza planning should include support for programs to meet Canadian target coverage rates for pneumococcal immunization²⁶⁻²⁸.

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7. **Strict adherence to hand washing/hand antisepsis recommendations (see Appendix III) is the cornerstone of infection prevention and may be the only preventative measure available during a pandemic.**

Planning should include ensuring that adequate supplies of hand hygiene products are a priority for all health care settings as there may be an interruption to the supply or shortages of hand antisepsis products, soap and hand towels.

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8. Planning should include the priority of maintaining adequate resources for infection control in acute care hospitals (soap, antiseptic products, masks/eye protection/face shields, gloves, gowns) due to the increased complexity and management issues of hospitalized patients.

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9. Planning should include ensuring all HCWs (see glossary for HCW definition) are offered hepatitis B immunization^{6,9}. As resources permit, HCWs should also receive TB skin testing,

should have proof of measles, mumps, rubella (MMR) immunity and receive a tetanus booster if appropriate⁶.

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3.2 Definitions for Infection Control/Occupational Health Management of Patients/Staff with Influenza-Like Illness (ILI)

3.2.1 Influenza-Like-Illness

See glossary term “influenza”.

Refer to Appendix IV for an ILI Assessment Tool. An ILI Assessment Tool is to be used for immediate triage of patients or staff and accommodation/cohort of patients, prior to further OH or clinical management.

3.2.2 Clinical Case Definition

See glossary term “influenza”.

3.2.3 Confirmed Case of Influenza

See glossary term “influenza”.

3.2.4 Immunity to Influenza

During a pandemic, it is likely that most cases of influenza will be caused by the pandemic strain. Data from the 1957 and 1968 pandemics show that the previously circulating influenza strain disappeared from human circulation when the pandemic strain of influenza virus emerged²⁵. Therefore, HCWs who have recovered from an ILI during an earlier pandemic phase, may be assumed to be immune to the pandemic influenza strain.

Individuals who have been immunized against the pandemic strain of influenza will also be considered immune, recognizing that the influenza vaccine may not be fully protective. Therefore, unlike individuals who have recovered from pandemic influenza or ILI, vaccinated individuals should be monitored for ILI using the ILI Assessment Tool found in Appendix IV.

3.3 Use of Influenza Immunization During an Influenza Pandemic

See the vaccine annex (Annex D) of the Canadian Pandemic Influenza Plan. Influenza vaccine availability in the early phase(s) of the pandemic is uncertain. When available, vaccine will be provided according to priority groups set by recommendations from the Vaccine Working Group. Health Care Workers and those trainees, volunteers, etc. who are recruited to perform the duties of a HCW are considered to be a high priority.

3.4 Use of Antivirals During an Influenza Pandemic

See the antivirals annex (Annex E) of the Canadian Pandemic Influenza Plan. Antiviral availability in the early phase(s) of the pandemic is uncertain. When available, antivirals will be provided according to priority groups set by recommendations from the Antiviral Working Group. Health

care workers and those trainees, volunteers, etc. who are recruited to perform the duties of a HCW are considered to be a high priority.

3.5 Occupational Health Management of Health Care Workers During an Influenza Pandemic

The phrases “fit for work”, “unfit for work”, and “fit to work with restrictions” are used by Occupational Health to communicate a worker’s ability to remain at or return to work depending upon their susceptibility to influenza, immunization status and agreement to use antivirals⁶. During the early phases of a pandemic, vaccine and antiviral availability will be limited and will be provided to priority groups. Health Care Workers, and those trainees, volunteers, etc. who are recruited to perform the duties of a HCW, are to be one of the priority groups. (See Annexes D and E of the Canadian Pandemic Influenza Plan.)

3.5.1 Recommendations

1. Fit for Work

- a) Ideally, HCWs are fit to work when one of the following conditions apply:
- i) they have recovered from ILI (see glossary for definition and ILI Assessment Tool, Appendix IV) illness during earlier phases of the pandemic;
 - ii) they have been immunized against the pandemic strain of influenza as outlined in Annex D of the Canadian Pandemic Influenza Plan; or,
 - iii) they are on appropriate antivirals as outlined in Annex E of the Canadian Pandemic Influenza Plan.

Such HCWs may work with all patients and may be selected to work in units where there are patients who, if infected with influenza, would be at high risk for complications.

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- b) Whenever possible, well, unexposed HCWs should work in non-influenza areas.

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- c) Asymptomatic HCWs may work even if influenza vaccine and antivirals are unavailable. Meticulous attention should be paid to hand hygiene and HCWs should avoid touching mucous membranes of the eye and mouth to prevent exposure to the influenza virus and other infective organisms.

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2. Unfit for Work

Ideally, staff with ILI should be considered “unfit for work” and should not work; nonetheless, due to limited resources, these HCWs may be asked to work if they are well enough to do so (see 3(b) below).

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3. Fit to Work with Restrictions

- a) Ideally, symptomatic staff who are considered “fit to work with restrictions” should only work with patients with ILI. Health Care Workers who must work with non-exposed patients (non-influenza areas) should be required to wear a mask if they are coughing and must pay meticulous attention to hand hygiene.

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- b) Symptomatic HCWs who are well enough to work should not be redeployed to intensive care areas, nurseries²⁹⁻³¹ or units with severely immunocompromised patients, i.e., transplant recipients³², hematology/oncology patients³³⁻³⁵, patients with chronic heart or lung disease, or patients with HIV/AIDS and dialysis patients.

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4.0 Pandemic Influenza Education

4.1 Pandemic Influenza Education for Health Care Workers (including Emergency Medical Services, mortuary workers, and HCWs in correctional settings)

Recommendations

1. Educational information for workers should be provided as soon as WHO Pandemic Phase 0 Level 1 is declared (see Appendix II) and repeated at frequent intervals to all staff levels and during all shifts.

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2. The pandemic influenza information should be appropriate to the audience and be provided using a variety of methods, e.g., postings in elevators, at facility entrances, brochures, newsletters and web sites.

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3. The educational information prepared and provided for workers should include:
 - a) an explanation that pandemic influenza is a novel strain of influenza and what a pandemic is;
 - b) the facility-specific pandemic influenza plan;
 - c) information regarding triage settings (see Section 7.1), self care (see Section 7.2) and temporary influenza hospitals (see Section 7.3).
 - d) the difference between an upper respiratory infection and influenza (see the introduction to the Preparedness Section of the Canadian Pandemic Influenza Plan);
 - e) the mode of influenza transmission (see Section 2.4);
 - f) the criteria for determining, influenza-like-illness (ILI) (see glossary for definition and Appendix IV for an ILI Assessment Tool) and influenza (see glossary for definition);
 - g) the risk of infection and subsequent complications in high-risk groups;
 - h) the message that **strict adherence to hand washing/hand antisepsis recommendations is the cornerstone of infection prevention and may be the only preventative measure available during early phases of the pandemic (see Appendix III)**;
 - i) information about the importance of hygienic measures (see Section 2.5) to minimize influenza transmission because influenza immunization and/or prophylaxis may not be available until later in the pandemic;
 - j) information indicating that, during the early phase of an influenza pandemic, it may be feasible for HCWs to wear masks when face-to-face with coughing individuals to minimize

influenza transmission (particularly when immunization and antivirals are not yet available) but not practical or helpful when transmission has entered the community (see Section 2.6). Masks may be worn by HCWs to prevent transmission of other organisms from patients with undiagnosed cough;

- k) who will be given the highest priority for immunization when vaccine is available,
- l) the importance of being immunized and safety of immunization (see Annexes D and E of the Canadian Pandemic Influenza Plan);
- m) who will be given what priority for prophylaxis when antivirals are available, the importance of prophylaxis and safety of prophylaxis (see Annexes D and E of the Canadian Pandemic Influenza Plan).

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4. Information about the importance of routine practices and additional precautions to prevent the transmission of infection during the delivery of health care in all health care settings during a pandemic. This information should include the caveat that some routine practice and additional precaution recommendations may be achievable only in the early phases of the pandemic and other recommendations may not be achievable as the pandemic spreads and resources (equipment, supplies and workers) become scarce.

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5. Priority for infection control resources should be assigned to acute care settings because of the complexity of managing high risk patients in acute care settings.

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6. Education about routine practices for those expected to work in non-traditional settings, as outlined in this document, should be available. Refer to Section 7.1 for Triage Settings, Section 7.2 for Self Care Settings and Section 7.3 for Temporary Influenza Hospitals.

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7. Education about Routine Practices in traditional health care settings, as outlined in Health Canada *Infection Control Guidelines Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care*, 1999, should be ongoing.

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8. HCWs should be provided with the recommendations for Occupational Health Management of workers during a pandemic (See Section 3.5).

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4.2 Pandemic Influenza Education for the Public (including child care workers, teachers, shelter workers, correctional workers, etc.)

Recommendations

1. Provide education appropriate to the recipient, as soon as WHO Pandemic Phase 0 Level 1 is declared (see Appendix II). Include information about the epidemiology and mode of transmission of influenza using a variety of methods, e.g., postings at facility entrances, brochures, newsletters, web sites, television and radio stations.

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2. Educational information prepared and provided for the public should include:
- a) an explanation that pandemic influenza is a novel strain of influenza and what a pandemic is;
 - b) information regarding Self Care (see Section 7.2 and Annex G of the Canadian Pandemic Influenza Plan) and for the purpose of Triage Settings and Temporary Influenza Hospitals (see Annex G of the Canadian Pandemic Influenza Plan);
 - c) the difference between an upper respiratory infection and influenza (see the introduction to the Preparedness Section of the Canadian Pandemic Influenza Plan);
 - d) the mode of transmission of influenza (see Section 2.4);
 - e) the criteria for determining, influenza-like-illness (ILI) (see glossary for definition and Appendix IV for an ILI Assessment Tool) and influenza (see Glossary for definition);
 - f) the risk of infection and subsequent complications in high-risk groups;
 - g) the message **that strict adherence to hand washing/hand antisepsis recommendations is the cornerstone of infection prevention and may be the only preventative measure available during the pandemic;**
 - h) information about the importance of hygienic measures, i.e., using disposable, one-use tissues for wiping noses; covering nose and mouth when sneezing and coughing; hand washing/hand antisepsis after coughing, sneezing or using tissues; and the importance of keeping hands away from the mucous membranes of the eyes and nose to minimize potential influenza transmission because influenza immunization and/or prophylaxis may not be available until later in the pandemic;
 - i) information that the influenza virus is readily inactivated by plain soap and common household cleaning products;
 - j) information indicating that during the early phase of an influenza pandemic, it may be feasible for HCWs to wear masks when coming face-to-face with coughing individuals to minimize influenza transmission (particularly when immunization and antivirals are not yet available) but not practical or helpful when transmission has entered the community. In health care settings, HCWs should wear masks to prevent transmission of other organisms from patients with undiagnosed cough (see Section 2.6);
 - k) who will be given the highest priority for immunization when a vaccine is available, importance of being immunized and safety of immunization (See the Preparedness Section of the Canadian Pandemic Influenza Plan);
 - l) who will be given what priority for prophylaxis when antivirals are available, the importance of prophylaxis and safety of prophylaxis (see Annex E of the Canadian Pandemic Influenza Plan).

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3. Provide information to encourage those who are symptomatic with ILI (see Appendix IV for an ILI Assessment Tool) but do not require formal health care, to remain at home until their symptoms have resolved.

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4. Provide information to encourage those with ILI (see Appendix IV for an ILI Assessment Tool) to avoid visiting those who are at high risk for complications if they developed influenza in institutional settings (acute care and long term care) until their symptoms have resolved.

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5. Inform the public to avoid public gatherings, as discussed in the following section, to minimize exposure.

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5.0 Public Health Restrictions on Public Gatherings

Medical Officers of Health, through their provincial/territorial Public Health Acts, have the authority to quarantine individuals or groups, as deemed necessary, to control infectious diseases. During the 1918 influenza pandemic in Alberta, drastic control measures were taken; masks were required when going out in public; all schools, churches and theatres were closed, public meetings banned and towns were quarantined (Alberta Pandemic Influenza Planning overhead presentation given by Dr. K Grismsrud at the Canadian Pandemic Planning meeting held in Montreal, May, 2001).

In an historical review of the 1918 pandemic in the United States, Keen-Payne³⁶ noted that many other centres used similar measures to attempt to curb transmission. In Chicago, persons who sneezed openly or who spit were threatened with arrests and fines. Churches were not closed, but parishioners were requested to stay home if ill, and windows were opened for ventilation during services. By the third week in October 1918, (the peak of the second wave) closing had extended to theaters, banquets, lecture halls, restaurants and movie shows.

In Newark, the state simply banned all public gatherings on October 10. Confusion developed when liquor stores were allowed to remain open for sales but churches were not open for congregating. The churches protested and the ban was lifted on October 21. In San Diego, all public facilities were closed (libraries, pool halls, women's weekly club meeting halls) as were all outdoor meetings except those convened to sell liberty bonds. The ban was lifted and then imposed again as new cases of influenza increased. Citizens were never strongly supportive of these measures³⁶.

The suggestion that the spread of influenza from US military camps in the summer of 1918 did not occur until school returned in the fall, has been noted³⁷. In the United States, illness rates of nearly 40% were reported among schoolchildren during the autumn wave³⁸.

Following the 1957 epidemic in Japan, the policy on influenza immunization was changed as it was determined that school attendance played an important part in spreading that epidemic. There were wide-spread school closures, with attack rates as high as 60% in some areas and approximately 8,000 deaths. The new policy stated that "because schoolchildren are the major disseminators of the disease, they should be immunized". In a study to review whether the policy of vaccination of school children in Japan (over a 25-year period) reduced the incidence and mortality attributed to influenza among older persons, the authors concluded that the vaccination of schoolchildren in Japan disrupted the spread of influenza to older persons³⁹.

There is evidence that closing schools may change the course of transmission^{12,40,41}. Studies conducted both during pandemic years and interpandemic years demonstrate that age specific attack rates are highest among school children¹². Additional studies noted that the age distribution of culture-positive patients changed during the course of epidemics. Initially, school children were culture positive, followed by a shift to preschool children and adults during the latter part of the epidemic⁴². The authors observed that school absenteeism was often followed by employee absenteeism during the influenza epidemics studied.

It is thought that management of exposure, as an approach to the prevention of a pandemic, is not possible because of the current high levels of international travel and the expansion

of populations into many regions of the world. Options for slowing the spread of pandemic influenza have been suggested and include the use of antiviral prophylaxis, limiting congregations of people and, possibly, quarantine⁴³.

In preparation of an influenza pandemic and in an attempt to curtail community transmission, there are neither data nor guidelines to determine which public gatherings to close and when to close them. What constitutes a public gathering and whether some gatherings may be defined as essential versus non-essential needs to be clarified. Examples of public gatherings from the above included: transportation (ground, rail and air), childcare, schools, retail settings, workplaces, places of worship, funerals and community events (cultural/sporting).

The principles to determine when, how, and which public gatherings will be restricted in order to curtail community transmission ought to be based on common sense strategies, and should be consistently applied within, and across, jurisdictions. The severity of the pandemic strain and the stage of the pandemic, as it unfolds globally, should be considered when making this determination. Refer to the Public Health Measures document of the Preparedness Section of the Canadian Pandemic Influenza Plan for more comprehensive public health recommendations than those listed below.

5.1 Recommendations

1. Medical Officers of Health should develop a predetermined strategy for closing public gatherings. If public gatherings are restricted they should be restricted early enough to affect transmission. The strategy should include but is not limited to:
 - a) the definition of what constitutes a public gathering;
 - b) specifying the time period within the pandemic phases to implement the strategy;
 - c) applicability and consistency across jurisdictions;
 - d) availability of and priority use of vaccine and antivirals as outlined in Annexes D and E of the Canadian Pandemic Influenza Plan;
 - e) consideration as to whether or not school age children are to be considered a high priority for immunization or antivirals in the early phase of the pandemic.

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Management of Pandemic Influenza in Traditional Health Care Setting

1.0 Management of Pandemic Influenza in Acute Care Settings

Acute care settings group patients together who have a high risk of developing serious, sometimes fatal, complications related to influenza. In addition, morbidity and mortality related to hospital-acquired (i.e., nosocomial) infections is much greater in acute care populations than in other populations.

A comprehensive infection prevention and control program forms the basis for a successful pandemic influenza plan. Adherence to infection prevention and control policies and procedures is imperative to minimize the transmission of influenza and other infectious diseases in the acute care setting with or without availability of immunization or chemoprophylaxis.

Recommendations

1.1 Prevention of Pandemic Influenza

A. Immunization and Antivirals

Adherence to recommendations for vaccine and antivirals for patients and HCWs, as outlined in Annexes D and E of the Canadian Pandemic Influenza Plan, is of paramount importance.

1.2 Control of Pandemic Influenza

A. Physical Setting

1. When Pandemic Phase 2 is declared (see Appendix II), open Triage Settings in acute care hospitals as predetermined in the Preparedness Section of the Canadian Pandemic Influenza Plan.

AIII

2. When Pandemic Phase 2 is declared (see Appendix II) open cohort areas/units⁴ in the hospital (See Sections F. and G. below) as predetermined in the IC/OH Pandemic Plan.

AIII

B. Management of Staff

1. Provide education, as outlined in Section 4.1.

2. Adhere to Occupational Health Management, as outlined in Section 3.5.

C. Infection Control Practices

1. Routine Practices

Using a program to prevent hospital-acquired (i.e., nosocomial) infections, acute care facilities should adhere to published guidelines including Health Canada Infection Control Guidelines. *Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care*⁵.

2. Additional Precautions

Although droplet and contact precautions are recommended in preventing the transmission of influenza during an interpandemic period, these precautions will not be achievable during a pandemic. In contrast, adherence to routine practices is achievable during a pandemic.

Routine Practices are summarized below:

a) Hand Hygiene

Staff, patients and visitors should recognize that **strict adherence to hand washing/hand antisepsis recommendations is the cornerstone of infection prevention and may be the only preventative measure available during a pandemic.**

- i. Hand hygiene procedures should be reinforced according to Appendix III.

AII

- ii. Hands should be washed or hand antisepsis performed after direct contact with patients/workers with ILI and after contact with their personal articles or their immediate environment.

AII

b) Hygiene Measures to Minimize Influenza Transmission

- i. Patients, staff and visitors should be encouraged to minimize potential influenza transmission through good hygienic measures, e.g., use disposable, one-use tissues for wiping noses; covering nose and mouth when sneezing and coughing; hand washing/hand antisepsis after coughing, sneezing or using tissues; and the importance of keeping hands away from the mucous membranes of the eyes and nose.

AIII

c) Personal Protective Equipment (PPE)

i. Masks

1. Masks to minimize the transmission of influenza may be worn when face-to-face with coughing individuals during the early phases of the pandemic but are not practical or helpful when influenza transmission has entered the community.

BIII

2. Masks should be worn to prevent the transmission of other organisms when HCWs are face-to-face with undiagnosed coughing patients.

BIII

3. Masks and eye protection, or face shields should be worn to prevent HCW exposure to sprays of blood, body secretions or excretions. Surgical masks are considered adequate for this purpose^{9,44,45}.

BIII

4. HCWs should avoid touching their eyes with their hands to prevent self-contamination with pathogens.

5. Use masks, as outlined in Section 2.6

ii. Gloves

1. Gloves are not required for the routine care of patients suspected or confirmed to have influenza. Meticulous hand washing with soap and water or performing hand antisepsis will inactivate the virus.

AIII

2. Gloves should be worn to provide an additional protective barrier between the HCWs hands and blood, body fluids, secretions, excretions and mucous membranes to reduce the potential transfer of microorganisms from infected patients to HCWs and from patient-to-patient via HCWs' hands.

AII

3. Gloves are necessary for HCWs with open lesions on their hands when providing direct patient care.

AII

4. Gloves should be used as an additional measure, not as a substitute for hand hygiene^{46,47}.

BII

5. Gloves should not be reused or washed⁴⁷.

AII

iii. Gowns

1. Gowns are not required for the routine care of patients suspected or confirmed to have influenza.

AI

2. Long sleeved gowns should only be used to protect uncovered skin and prevent soiling of clothing during procedures and patient care activities likely to generate splashes or sprays of blood, body fluids, secretions or excretions^{9,45}.

BIII

3. HCWs should ensure any open skin areas/lesions on forearms or exposed skin are covered with a dry dressing at all times. Intact skin that has been contaminated with blood, body fluids, secretions or excretions should be washed as soon as possible, thoroughly, but gently with soap and warm running water.

BIII

d) Cleaning, Disinfection, and Sterilization of Patient Care Equipment

i. Acute care settings should adhere to the recommendations for cleaning, disinfection and sterilization of patient care equipment, as outlined in the Health Canada Infection Control Guidelines *Handwashing, Cleaning Disinfection and Sterilization in Health Care*³ and *Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care*⁵.

AIII

e) Environmental Control (Housekeeping, Laundry, Waste)

i. Acute care settings should adhere to the recommendations for housekeeping, laundry and waste management as outlined in the Health Canada Infection Control Guidelines

Handwashing, Cleaning Disinfection and Sterilization in Health Care³ and Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care⁵.

AIII

- ii. Equipment and surfaces contaminated with secretions from patients suspected or confirmed to have influenza should be cleaned before use with another patient.
- iii. Special handling of linen or waste contaminated with secretions from patients suspected or confirmed to have influenza is not required.

BIII

AII

D. Accommodation

1. Single rooms in acute care settings⁵ are limited and should be for those suspected of having or confirmed to have airborne infections, e.g., tuberculosis, measles, varicella and disseminated zoster and those who visibly soil the environment for whom appropriate hygiene cannot be maintained.
2. Minimize crowding (i.e., maintain a one metre spatial separation) between patients, visitors and workers whenever possible.

AII

AIII

E. Patient Triage/Cohorting

1. When Pandemic Phase 2 is declared (see Appendix II) open the following specified cohort areas/units⁴ in the hospital, as predetermined in the IC/OH Pandemic Plan:
 - a) Influenza-Like-Illness (ILI), Assessment Area (see Glossary for definition and Appendix IV for an ILI Assessment tool).
 - b) Non ILI Assessment Area (patients require acute care assessment for other conditions).
 - c) Suspected/Exposed to ILI, In-patient Units.
 - d) Confirmed Influenza (see Glossary for definition), In-patient Units.
 - e) Not Exposed/Immune* to Influenza, In-patient Units;
 - f) Not Exposed to ILI but at very high risk of complications, In-patient Units (e.g., intensive care areas; nurseries²⁹⁻³¹ or units with severely immunocompromised patients, e.g., transplant recipients³² hematology/oncology patients³³⁻³⁵, patients with chronic heart or lung disease or patients with HIV/AIDS and dialysis patients).

AIII

Note: *Immune are those recovered from the pandemic strain of influenza or those immunized against the pandemic strain of influenza (see Section 3.2.4). As noted, the influenza vaccine may not be 100% efficacious in providing immunity.

2. In acute care settings, (hospitals), triage ILI patients promptly to a separate designated influenza assessment area onsite, to minimize transmission to others in the waiting room.

AIII

3. In acute care settings, (hospitals), triage non ILI patients (but requiring acute care assessment) promptly to specific non ILI waiting and examining areas physically separate from the ILI assessment area to prevent their exposure to ILI.

AIII

F. Patient Admission

1. When Pandemic Phase 2 is declared (see Appendix II), eliminate or curtail elective medical and surgical acute care (hospital) admissions and restrict cardiovascular and pulmonary surgery to emergency cases¹⁷.

AIII

2. Patients who have recovered from influenza can be moved into the “Non Influenza” cohort areas after the period of communicability of the pandemic strain has passed.

AIII

3. As the pandemic progresses, the “Suspect/Exposed” Cohort and the “Confirmed Influenza” cohort may be merged.

AIII

4. Maintain cohort principles until the pandemic wave has been declared over.

AIII

G. Patient Activity Restrictions

1. Limit movement/activities of patients including transfers within the hospital, unless the patient has recovered from pandemic influenza.

AIII

2. Patients with ILI who are coughing should only leave their room for urgent/necessary procedures.

AIII

3. Patients with ILI who are coughing should wear a surgical mask whenever they need to be out of their room until the period of communicability of the pandemic strain has passed.

AIII

H. Visitor Restrictions

1. There are no restrictions for asymptomatic visitors who have recovered from pandemic influenza or who have been immunized against the pandemic strain of influenza.

AIII

2. Visitors with ILI should not visit until they are asymptomatic. Close relatives of terminally ill patients can be exempt, but should put a mask on upon entry into the facility and their visit shall be restricted to that patient only.

AIII

3. Visitors should be informed when the acute care facility has influenza activity. Those who have not yet had the pandemic strain of influenza or who have not been immunized against the pandemic strain, should be discouraged from visiting. Close relatives of terminally ill patients can be exempt, but they should restrict their visit to that individual only and they should wash their hands on exit from the patient’s room. Wearing a mask upon entry to the facility is only useful if there is no influenza in the community.

AIII

2.0 Management of Pandemic Influenza in Long Term Care Settings

Interpandemic influenza is a major cause of illness and death in residents of long term care facilities for the elderly, in part, because the resident's age and underlying illness increase the risk of serious complications and, in part, because institutional living increases the risk of influenza outbreaks^{24,48,49}. It is reasonable to anticipate that pandemic influenza would have the same impact in long term care settings.

A comprehensive infection prevention and control program forms the basis for a successful pandemic influenza plan. Adherence to infection prevention and control policies and procedures is imperative to minimize the transmission of influenza and other infectious diseases in the long term care setting with or without the availability of immunization or chemoprophylaxis.

Recommendations

2.1 Prevention of Pandemic Influenza

A. Immunization and Antivirals

Adherence to the recommendations for vaccine and antivirals for residents and HCWs, as outlined in Annexes D and E of the Canadian Pandemic Influenza Plan, is necessary.

2.2 Control of Pandemic Influenza

A. Physical Setting

When Pandemic Phase 2 is declared (see Appendix II), open the area for the care of residents who will require “acute influenza care” as predetermined in the Infection Control/Occupational Health (IC/OH) Pandemic Plan to minimize transfer to acute care hospitals (also See Section F below and the Preparedness Section of the Canadian Pandemic Influenza Plan).

AIII

B. Management of Staff

1. Provide education, as outlined in Section 4.1.
2. Adhere to Occupational Health Management, as outlined in Section 3.5.

C. Infection Control Practices

1. Using a program to prevent health care-acquired (i.e. nosocomial) infections, long term care facilities should adhere to published guidelines^{50,51}, including Health Canada Infection Control Guidelines *Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care*⁵.
2. Additional Precautions

Although droplet and contact precautions are recommended in preventing the transmission of influenza during an interpandemic period, these precautions will not be achievable during a pandemic. In contrast, adherence to routine practices is achievable during a pandemic.

Routine Practices are summarized below:

a) Hand Hygiene

- i. Staff, residents and visitors should recognize that **strict adherence to hand washing/ hand antiseptics recommendations is the cornerstone of infection prevention and may be the only preventative measure available during a pandemic.**

Hand Hygiene procedures should be reinforced according to Appendix III.

AII

- ii. Hands should be washed or hand antiseptics performed after direct contact with residents/workers with ILI (see Appendix IV for ILI an Assessment Tool) and after contact with their personal articles or their immediate environment.

AII

b) Hygiene Measures to Minimize Influenza Transmission

- i. Staff, residents and visitors should be encouraged to minimize potential influenza transmission through good hygienic measures, i.e., use disposable, one-use tissues for wiping noses; covering nose and mouth when sneezing and coughing; handwashing/ hand antiseptics after coughing, sneezing or using tissues; and the importance of keeping hands away from the mucous membranes of the eyes and nose.

AIII

c) Personal Protective Equipment

i. Masks

1. Masks to minimize the transmission of influenza may be worn when face-to-face with coughing individuals during the early phases of the pandemic but are not practical or helpful when transmission has entered the community.

BIII

2. Masks should be worn to prevent the transmission of other organisms when HCWs are face-to-face with undiagnosed coughing patients.

BIII

3. Masks and eye protection, or face shields should be worn to prevent HCW exposure to sprays of blood, body secretions or excretions. Surgical masks are considered adequate for this purpose^{9,44,45}.

BIII

4. HCWs should avoid touching their eyes with their hands to prevent self-contamination with pathogens.

5. Masks should be worn, as outlined in Section 2.6.

ii. Gloves

1. Gloves are not required for the routine care of residents suspected of having or confirmed to have influenza. Meticulous handwashing with soap and water or performing hand antiseptics will inactivate the virus.

AIII

2. Gloves should be worn to provide an additional protective barrier between the HCWs hands and blood, body fluids, secretions, excretions and mucous membranes to

reduce the potential transfer of microorganisms from infected residents to HCWs and from resident to resident via HCW hands.

AII

3. Gloves are necessary for HCWs with open lesions on their hands when providing direct resident care.

AII

4. Gloves should be used as an additional measure, not as a substitute for hand hygiene^{46,47}.

BII

5. Gloves should not be reused or washed⁴⁷.

AII

iii. Gowns

1. Gowns are not required for the routine care of residents suspected of having or confirmed to have influenza.

AI

2. Long sleeved gowns should only be used to protect uncovered skin and prevent soiling of clothing during procedures and resident care activities likely to generate splashes or sprays of blood, body fluids, secretions or excretions^{9,45}.

BIII

3. HCWs should ensure any open skin areas/lesions on forearms or exposed skin are covered with a dry dressing at all times. Intact skin that has been contaminated with blood, body fluids, secretions or excretions should be washed as soon as possible, thoroughly but gently with soap and warm running water.

BIII

d) Cleaning Disinfection Sterilization of Resident Care Equipment

- i. Long term care settings should adhere to the recommendations for cleaning, disinfection and sterilization of resident care equipment as outlined in the Health Canada Infection Control Guidelines *Handwashing, Cleaning Disinfection and Sterilization in Health Care*³ and *Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care*⁵.

AIII

e) Environmental Control (Housekeeping, Laundry, Waste)

- i. Long term care settings should adhere to recommendations for housekeeping, laundry and waste management as outlined in the Health Canada Infection Control Guidelines *Handwashing, Cleaning Disinfection and Sterilization in Health Care*³ and *Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care*⁵.

AIII

- ii. Equipment and surfaces contaminated with secretions from residents suspected of having or confirmed to have influenza should be cleaned before use with another patient.

BIII

- iii. Special handling of linen or waste contaminated with secretions from residents suspected of having or confirmed to have influenza is not required.

AII

D. Transfer to Acute Care

1. Residents with influenza (see Glossary for definition) or Influenza-Like Illness (ILI) (see Glossary for definition and Appendix IV for an ILI Assessment Tool) requiring more acute care should not be transferred to acute care settings. Such residents should be cared for in “acute influenza care” areas within the LTC facility as described in the IC/OH Pandemic Influenza Plan.

BIII

E. Admission/Re-Admission

1. Patients from acute care who have recovered from pandemic influenza or who are immunized against the pandemic influenza strain may be admitted into the LTC facility without restrictions.
2. Residents who were transferred to acute care and who have recovered from pandemic influenza or who have been immunized against the pandemic influenza strain may be re-admitted into the LTC facility without restrictions.
3. LTC facilities that have already had pandemic influenza through their facility may admit individuals from the community or acute care without restrictions.
4. LTC facilities that have remained “influenza free” may admit patients from acute care or the community who have been potentially exposed to influenza. However, such residents must be managed using influenza precautions (maintain one metre of spatial separation, mask if within one metre of the resident and emphasize hand hygiene) for 3 days until past the incubation period if no influenza symptoms occur and until 7 days after the onset of symptoms if influenza develops.

AIII

AIII

AIII

AIII

F. Cohorting

1. Cohorting resident groups (i.e., confirmed/suspected influenza, exposed/not exposed to influenza) is not a feasible measure to control pandemic influenza in a LTC facility. When influenza has been identified in one area of the LTC facility (via residents, staff or visitors) it can be assumed that the facility has been exposed and the following measures should occur:
 - a) Cancel or postpone inside and outside facility procedures, appointments and activities until influenza activity has stopped.
 - b) Encourage coughing residents to remain in their own rooms to prevent the spread of influenza in common areas.

AIII

G. Visitor Restrictions

1. There are no restrictions for asymptomatic visitors who have recovered from pandemic influenza or have received immunization against the pandemic strain of influenza.
2. If the LTC facility has remained “influenza free”, visitors with ILI (see Glossary for definition and Appendix IV for an ILI Assessment Tool) should not visit until they have recovered. Visitors for terminally ill residents may be exempt, but should put a mask on upon entering the facility and restrict their visit to that resident only.

AIII

AIII

3. Visitors should be informed when the LTC facility has experienced influenza activity. Those visitors who have not yet had the pandemic strain of influenza and are not immunized against the pandemic strain, should be discouraged from visiting. Visitors for terminally ill residents can be exempt, but should restrict their visit to that resident only and wash their hands on exit from the resident's room. Wearing a mask upon entering the facility is only useful if there is no influenza in the community.

AIII

3.0 Management of Pandemic Influenza in Ambulatory Care Settings

A comprehensive infection prevention and control program forms the basis for a successful pandemic plan. Adherence to infection prevention and control policies and procedures is imperative to minimize the transmission of influenza and other infectious diseases in the ambulatory care setting with or without availability of immunization or chemoprophylaxis.

Recommendations

3.1 Prevention of Pandemic Influenza

A. Immunization and Antivirals

Adherence to the recommendations for vaccine and antivirals for patients and HCWs, as outlined in Annexes D and E of the Canadian Pandemic Influenza Plan is required.

3.2 Control of Pandemic Influenza

A. Administration

1. When Pandemic Phase 2 is declared (see appendix II), non-urgent and routine ambulatory care visits should be cancelled.
BIII
2. Consider creating a dedicated “hot line” to provide consistent pandemic influenza information explaining symptoms of Influenza-like-illness (ILI) (see Glossary for definition and Appendix IV for an ILI Assessment Tool), the purpose of Triage Settings (see Annex G of the Canadian Pandemic Influenza Plan) and Self-care guidelines (See 7.2 and Annex G of the Canadian Pandemic Influenza Plan).
AIII
3. When Pandemic Phase 2 is declared (see Appendix II), open Triage Settings in Ambulatory Care, as described in the Preparedness Section of the Canadian Pandemic Influenza Plan).
AIII
4. Patients attending ambulatory settings for concerns related to ILI should be assessed according to an ILI Assessment Tool, (see Appendix IV).
AIII

B. Physical Setting

1. If possible, separate well patients from those with ILI by considering the following strategies:
(a) minimizing time spent in waiting rooms; (b) providing separate entrance/waiting areas for patients with ILI; (c) placing patients with ILI directly into a single room; or, (d) separating patients as quickly as possible by placing ILI patients in an area of the waiting room separated from non ILI patients by at least 1 metre. AIII
2. Remove magazines and toys from the waiting rooms. AIII
3. Clean equipment and environmental surfaces, potentially contaminated by coughing patients, as frequently as possible, preferably after each patient. AII

C. Management of Staff

1. Provide education as outlined in Section 4.1.
2. Adhere to Occupational Health Management of staff as outlined in Section 3.5.

D. Infection Control Practices

1. Ambulatory care settings should adhere to published infection control guidelines⁵²⁻⁵⁸ to prevent infections, including Health Canada Infection Control Guidelines *Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care*⁵.

2. Additional Precautions

Although droplet and contact precautions are recommended in preventing the transmission of influenza during an interpandemic period, these precautions will not be achievable during a pandemic. In contrast, adherence to routine practices is achievable during a pandemic.

Routine Practices are summarized below:

a) Hand Hygiene

- i. Staff, patients and those attending to a patient should recognize that **strict adherence to hand washing/ hand antisepsis recommendations is the cornerstone of infection prevention and may be the only preventative measure available during a pandemic.** Hand hygiene procedures should be reinforced according to Appendix III. AII

- ii. Hands should be washed or hand antisepsis performed after direct contact with ILI patients, after contact with their personal articles or their immediate environment. AII

b) Hygiene Measures to Minimize Influenza Transmission

- i. Ambulatory care workers and their patients should be encouraged to minimize potential influenza transmission through good hygienic measures, i.e., use disposable, one-use tissues for wiping noses; covering nose and mouth when sneezing and coughing; hand washing/hand antisepsis after coughing, sneezing or using tissues; and the importance of keeping hands away from the mucous membranes of the eyes and nose. AIII

d) Personal Protective Equipment

i. Masks, Eye Protection and Face Shields

1. Masks to minimize the transmission of influenza may be worn when face-to-face with coughing individuals in the early phase(s) of the pandemic but are not practical or helpful when influenza transmission has entered the community. **BIII**
2. Masks should be worn to prevent the transmission of other organisms when HCWs are face-to-face with undiagnosed coughing patients. **BIII**
3. Masks and eye protection, or face shields should be worn to prevent HCW exposure to sprays of blood, body secretions or excretions. Surgical masks are considered adequate for this purpose^{9,44,45}. **BIII**
4. HCWs should avoid touching their eyes with their hands to prevent self-contamination with pathogens.
5. Masks should be worn, as outlined in Section 2.6.

ii. Gloves

1. Gloves are not required for the routine care of patients suspected of having or confirmed to have influenza. Meticulous hand washing with soap and water or performing hand antisepsis will inactivate the virus. **AIII**
2. Gloves should be worn to provide an additional protective barrier between the HCWs hands and blood, body fluids, secretions, excretions and mucous membranes to reduce the potential transfer of microorganisms from infected patients to HCWs and from patient to patient via HCWs' hands. **AII**
3. Gloves are necessary for HCWs with open lesions on their hands when providing direct patient care. **AII**
4. Gloves should be used as an additional measure, not as a substitute for hand hygiene^{46,47}. **BII**
5. Gloves should not be reused or washed⁴⁷. **AII**

iii. Gowns

1. Gowns are not required for the routine care of patients suspected of having or confirmed to have influenza. **AI**
2. Long sleeved gowns should only be used to protect uncovered skin and prevent soiling of clothing during procedures and resident care activities likely to generate splashes or sprays of blood, body fluids, secretions or excretions^{9,45}. **BIII**
3. HCWs should ensure any open skin areas/lesions on forearms or exposed skin are covered with a dry dressing at all times. Intact skin that has been contaminated with

blood, body fluids, secretions or excretions should be washed as soon as possible, thoroughly, but gently with soap and warm running water.

BII

E. Patient Activity/Transport

Patients with ILI should not leave the ambulatory care area, except for essential procedures.

AIII

4.0 Management of Pandemic Influenza in Home Care Settings (Care Provided by Regulated and Unregulated HCWs)

A comprehensive infection prevention and control program forms the basis for a successful pandemic influenza plan. Adherence to infection prevention and control policies and procedures is imperative to minimize the transmission of influenza and other infectious diseases in the home care setting with or without availability of immunization or chemoprophylaxis.

Recommendations

4.1 Prevention of Pandemic Influenza

A. Immunization and Antivirals

1. Adherence to the recommendations for vaccine and antivirals for patients and HCWs, as outlined in Annexes D and E of the Canadian Pandemic Influenza Plan, is necessary.

4.2 Control of Pandemic Influenza

A. Physical Setting

1. When Pandemic phase 2 (see Appendix II) is declared, cancel home care visits that are not absolutely necessary.

BIII

B. Management of Staff

1. Provide education, as outlined in Section 4.1.
2. Adhere to Occupational Health Management of staff as outlined in Section 3.5.

C. Infection Control Practices

1. Home care settings should adhere to published infection control guidelines⁵⁹⁻⁶² including Health Canada Infection Control Guidelines *Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care*⁵.

2. Additional Precautions

Although droplet and contact precautions are recommended in preventing the transmission of influenza during an interpandemic period, these precautions will not be achievable during a pandemic. In contrast, adherence to routine practices is achievable during a pandemic.

Routine Practices are summarized below:

a) Hand Hygiene

- i. HCWs, clients and household members should recognize that **strict adherence to hand washing/hand antiseptics recommendations is the cornerstone of infection prevention and may be the only preventative measure available during a pandemic. Hand hygiene procedures should be reinforced according to Appendix III.**

AI

- ii. Hands should be washed or hand antiseptics performed following direct contact with a client with ILI, articles contaminated by the client and the client's immediate environment.

AI

- iii. If running water is not available or when hand-washing facilities are inaccessible, use the following steps for effective hand antiseptics:

Apply an alcohol-based hand hygiene product to dry hands (moisture dilutes the alcohol) and rub vigorously for the period of time specified by the manufacturer, or until dry.

If there is heavy microbial soiling, first wipe hands with a towelette to remove visible soiling.

AI

b) Hygiene Measures to Minimize Influenza Transmission

Home care workers and their clients should be encouraged to minimize potential influenza transmission through good hygienic measures, i.e., use disposable, one-use tissues for wiping noses; covering nose and mouth when sneezing and coughing; handwashing/hand antiseptics after coughing, sneezing or using tissues; and the importance of keeping hands away from the mucous membranes of the eyes and nose.

AIII

c) Personal Protective Equipment

i. Masks, Eye Protection and Face Shields

1. Masks to minimize the transmission of influenza may be worn when face-to-face with coughing individuals in the early phase(s) of the pandemic but are not practical or helpful when influenza transmission has entered the community.

BIII

2. Masks should be worn to prevent the transmission of other organisms when HCWs are face-to-face with undiagnosed coughing clients.

BIII

3. Masks and eye protection, or face shields should be worn to prevent HCW exposure to sprays of blood, body secretions or excretions. Surgical masks are considered adequate for this purpose^{9,44,45}.

BIII

4. HCWs should avoid touching their eyes with their hands to prevent self-contamination with pathogens.

5. Masks should be worn, as outlined in Section 2.6.

ii. Gloves

1. Gloves are not required for the routine care of clients suspected of having or confirmed to have influenza. Meticulous handwashing with soap and water or performing hand antisepsis will inactivate the virus.

AIII

2. Gloves should be worn to provide an additional protective barrier between the HCWs hands and blood, body fluids, secretions, excretions and mucous membranes to reduce the potential transfer of microorganisms from infected clients to HCWs.

AII

3. Gloves are necessary for HCWs with open lesions on their hands when providing direct client care.

AII

4. Gloves should be used as an additional measure, not as a substitute for handwashing^{46,47}.

BII

5. Gloves should not be reused or washed⁴⁷.

AII

iii. Gowns

1. Gowns are not required for the routine care of clients suspected of having or confirmed to have influenza.

AI

2. Long sleeved gowns should only be used to protect uncovered skin and prevent soiling of clothing during procedures and patient care activities likely to generate splashes or sprays of blood, body fluids, secretions or excretions^{9,45}.

BIII

3. HCWs should ensure any open skin areas/lesions on forearms or exposed skin are covered with a dry dressing at all times. Intact skin that has been contaminated with blood, body fluids, secretion or excretions should be washed as soon as possible, thoroughly but gently with soap and warm running water.

BIII

D. Triage

1. Perform an ILI assessment (see appendix IV for an ILI Assessment Tool and glossary for definition of ILI) of the client and their household contacts by phone (if possible) prior to the appointment or before going into the home. Assess the risk of influenza in the client or household contacts.

AIII

2. Provide clients and family members with information regarding symptoms of ILI and Self Care Guidelines and the purpose of Triage Settings (see Annex G of the Canadian Pandemic Influenza Plan).

AIII

3. Counsel clients and household contacts to avoid public gatherings to minimize exposure.

E. Visitors

1. Only well (asymptomatic/unexposed) visitors should visit severely immunocompromised patients in the home, e.g., transplant recipients³², hematology/oncology patients³³⁻³⁵, patients with chronic heart or lung disease or patients with HIV/AIDS and dialysis patients as these patients are at risk of serious complications if infected with influenza. **AIII**
2. Visitors for the terminally ill can be exempt. **AIII**

5.0 Management of Pandemic Influenza in Community Settings

5.1 Management of Pandemic Influenza in Emergency Responder Settings

A comprehensive infection prevention and control program forms the basis for a successful pandemic influenza plan. Emergency Responders (see Glossary for definition) are to be a priority group to receive influenza vaccination and chemoprophylaxis when, and if, it is available during a pandemic. Adherence to infection prevention and control policies and procedures is imperative to minimize the transmission of influenza and other infectious diseases with or without the availability of immunization or chemoprophylaxis.

Recommendations

A. Pandemic Planning

1. Management should ensure the responsibility for Infection Control (IC) and Occupational Health (OH) in the emergency responder setting is assigned to a specific individual. **AIII**
2. Management should develop an interpandemic influenza plan and review it yearly. In addition, an IC/OH Pandemic Influenza Plan should be developed as outlined in Section 3.1 and reviewed every 3 years. **AIII**
3. Provide education, as outlined in Section 4.1.
4. Occupational Health management of emergency responder workers should be in keeping with OH Section 3.5.

B. Control of Pandemic Influenza

1. Immunization/Chemoprophylaxis

In the early phases of the pandemic, vaccine and antivirals may not be readily available. Essential workers (including EMS) will be given high priority for immunization when vaccine is available (see Annexes D and E of the Canadian Pandemic Influenza Plan).

2. Infection Control Practices

Emergency Service Workers should adhere to routine infection control practices^{5,63,64}. All patients' blood and body secretions should be considered infectious, thus personal protective equipment and barrier techniques should be used accordingly.

Additional Precautions

Although droplet and contact precautions are recommended in preventing the transmission of influenza during an interpandemic period, these precautions will not be achievable during a pandemic. In contrast, adherence to routine practices is achievable during a pandemic.

Routine Practices are summarized below:

a) Hand Hygiene

- i. Strict adherence to hand washing/hand antiseptics recommendations is the cornerstone of infection prevention and may be the only preventative measure available during a pandemic.

Hand hygiene procedures should be reinforced according to Appendix III.

AII

- ii. Hands should be washed or hand antiseptics performed after direct contact with individuals with suspected or confirmed influenza and after contact with their personal articles or their immediate environment.

AII

- iii. Waterless antiseptic hand rinses are superior to soap and water for reducing hand contamination⁶⁵⁻⁶⁸ and should be made available as an alternative to hand washing. Antiseptic hand rinses are especially useful when time for hand washing or access to sinks is limited.

BIII

- iv. When there is visible soiling, hands should be washed with soap and water before using waterless antiseptic hand rinses. If soap and water are unavailable, cleanse hands first with detergent-containing towelettes.

BIII

- v. Wearing gloves does not eliminate the need for proper hand hygiene after care is rendered. As soon as feasible, hands must be washed after the removal of gloves.

AI

b) Hygiene Measures to Minimize Influenza Transmission

- i. Emergency Responders should be encouraged to minimize potential influenza transmission through good hygienic measures, i.e., use disposable, one-use tissues for wiping noses; covering nose and mouth when sneezing and coughing; handwashing/hand antiseptics after coughing, sneezing or using tissues; and the importance of keeping hands away from the mucous membranes of the eyes and nose.

AIII

c) Personal Protective Equipment

i. Masks

1. Masks may be worn to minimize the transmission of influenza when face-to-face with coughing individuals in the early phase(s) of the pandemic but are not practical or helpful when influenza transmission has entered the community

BIII

2. Masks should be worn to prevent the transmission of other organisms when HCWs are face-to-face with undiagnosed coughing patients.

BIII

3. Masks and eye protection, or face shields should be worn to prevent HCW exposure to sprays of blood, body secretions or excretions. Surgical masks are considered adequate for this purpose^{9,44,45}.

BIII

4. HCWs should avoid touching their eyes with their hands to prevent self-contamination with pathogens.

5. Masks should be worn, as outlined in Section 2.6.

ii. Gloves

1. Gloves are not required for the routine care of patients suspected or confirmed to have influenza. Meticulous handwashing with soap and water or performing hand antisepsis will inactivate the virus.

AIII

2. Gloves should be worn to provide an additional protective barrier between the HCWs hands and blood, body fluids, secretions, excretions and mucous membranes to reduce the potential transfer of microorganisms from infected clients to HCWs.

AII

3. Gloves are necessary for HCWs with open lesions on their hands when providing direct patient care.

AII

4. Gloves should be used as an additional measure, not as a substitute for hand hygiene^{46,47}.

AII

5. Gloves should not be reused or washed⁴⁷.

AII

iii. Gowns

1. Gowns are not required for the routine care of patients with ILI.

AI

2. Long sleeved gowns should only be used to protect uncovered skin and prevent soiling of clothing during procedures and patient care activities likely to generate splashes or sprays of blood, body fluids, secretions or excretions^{9,45}.

BIII

3. HCWs should ensure any open skin areas/lesions on forearms or exposed skin are covered with a dry dressing at all times. Intact skin that has been contaminated with blood, body fluids, secretion or excretions should be washed as soon as possible, thoroughly, but gently, with soap and warm running water.

BIII

d) Patient Triage

Whenever feasible, personnel responsible for answering emergency calls related to influenza-like-illness (ILI) should triage patients according to an ILI Assessment Tool (see Appendix IV).

AIII

- e) Environmental Control (Housekeeping, Laundry, Waste)
 - i. Emergency Responders should adhere to the recommendations for housekeeping, laundry and waste management, as outlined in the Health Canada Infection Control Guidelines *Handwashing, Cleaning Disinfection and Sterilization in Health Care*³ and *Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care*⁵. **AIII**
 - ii. Equipment and surfaces contaminated with secretions from patients suspected or confirmed to have influenza should be cleaned before use with another patient. **BIII**
 - iii. Special handling of linen or waste contaminated with secretions from patients suspected of having or confirmed to have influenza is not required. **AI**
- f) Patient Care Equipment (Cleaning Disinfection Sterilization)
 - i. Emergency Responders should adhere to the recommendations for cleaning, disinfection and sterilization of patient care equipment, as outlined in the Health Canada Infection Control Guidelines *Handwashing, Cleaning Disinfection and Sterilization in Health Care*³ and *Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care*⁵. **AIII**

5.2 Management of Pandemic Influenza in Mortuary Care Settings

The risk of influenza transmission to Funeral Service Workers will be through their contact with families and friends of the deceased, not the deceased. There is no additional risk of transmission of influenza to funeral home workers related to handling of bodies of persons suspected of having or confirmed to have died from influenza. Deceased bodies (confirmed as having or suspected to have influenza during interpandemic or pandemic years) require routine handling only. Infection control recommendations for Funeral Services Profession have been published^{9,69}.

A comprehensive infection prevention and control program forms the basis for a successful pandemic influenza plan. Adherence to infection prevention and control policies and procedures is imperative to minimize the transmission of influenza and other infectious diseases with or without the availability of immunization or chemoprophylaxis.

Recommendations

A. Planning for Pandemic Influenza

1. Management should ensure the responsibility for Infection Control (IC) and Occupational Health (OH) in a funeral home setting is assigned to a specific individual; preferably an individual who has had professional training. **AIII**
2. Management should develop an interpandemic influenza plan and review it yearly. In addition, an IC/OH Pandemic Influenza Plan should be developed as outlined in Section 3.1 and reviewed every 3 years.
3. Management should provide education as outlined, in Section 4.1.

B. Control of Pandemic Influenza

Immunization/Chemoprophylaxis

1. In the early phases of the pandemic, vaccine and antivirals may not be readily available. Essential workers (including funeral service workers) will be given high priority for immunization when vaccine is available (see Annexes D and E of the Canadian Pandemic Influenza Plan).

Infection Control Practices

1. Funeral Service Workers should adhere to routine infection control practices^{9,69} in the handling of all deceased bodies regardless of the confirmed or suspected cause of death. All patients' blood and body secretions should be considered infectious, thus personal protective equipment and barrier techniques should be used accordingly.

AIII

a) Hand Hygiene

- i. Strict adherence to hand washing/hand antisepsis recommendations is the cornerstone of infection prevention and may be the only preventative measure available during a pandemic.

Hand hygiene procedures should be reinforced according to Appendix III.

AII

- ii. Hands should be washed or hand antisepsis performed after direct contact with individuals with suspected or confirmed influenza and after contact with their personal articles or their immediate environment.

AII

b) Hygiene Measures to Minimize Influenza Transmission

- i. Funeral Service Workers should be encouraged to minimize potential influenza transmission through good hygienic measures, i.e., use disposable, one-use tissues for wiping noses; covering nose and mouth when sneezing and coughing; handwashing/hand antisepsis after coughing, sneezing or using tissues; and the importance of keeping hands away from the mucous membranes of the eyes and nose.

AIII

c) Personal Protective Equipment

i. Masks

1. Wearing masks when handling bodies suspected of having or confirmed to have influenza during a pandemic to minimize the transmission of influenza is not required.

BIII

2. Wearing masks when face-to-face with coughing individuals to minimize influenza transmission during a pandemic will not be practical or helpful when transmission has entered the community.

BIII

5.3 Management of Pandemic Influenza in Child Care Settings

Infectious diseases occur with increased frequency in child care settings. The incidence is affected by the age and immune status of children, the number of children and group size, the

degree of close contact between children and attendants and the hygienic habits of children and attendants. Infections acquired in the child care setting may spread to attendants, family members and the community.

Influenza in child care settings can be significant because viral shedding in the nasal secretions usually continues for about 7 days from the onset of illness and can be more prolonged in young children²³. Attack rates of influenza in healthy children have been estimated at 10%-40% each year, with approximately 1% resulting in hospitalization.

A comprehensive infection prevention and control program forms the basis for a successful pandemic influenza plan. Adherence to infection prevention and control policies and procedures is imperative to minimize the transmission of influenza and other infectious diseases in the child care setting with or without availability of immunization or chemoprophylaxis.

Recommendations

Planning for Pandemic Influenza

1. One person in the program must be designated as the individual responsible for the Infection Control (IC)⁷⁰ and Occupational Health (OH) program. **AIII**
2. Management should develop an interpandemic influenza plan and review it annually. In addition, an IC/OH Pandemic Influenza Plan should be developed, as outlined in Section 3.1 and reviewed every 3 years.
3. Education should be provided, as outlined in Section 4.2.

Control of Pandemic Influenza

A. Immunization/Chemoprophylaxis

1. In the early phases of the pandemic, vaccine and antivirals may not be readily available. (See Annexes D and E of the Canadian Pandemic Influenza Plan).

B. Infection Control Practices

1. Child Care Workers should adhere to routine infection control practices⁷¹⁻⁷⁷ including procedures for washing toys.
 - a) Hand Hygiene
 1. Workers, children and their families should recognize that strict adherence to hand washing/hand antisepsis recommendations is the cornerstone of infection prevention and may be the only preventative measure available during a pandemic. Hand hygiene procedures should be reinforced according to Appendix III. **AII**
 2. Hands should be washed or hand antisepsis performed after direct contact with individuals with ILI (see glossary for definition and Appendix IV for an ILI Assessment Tool) and after contact with their personal articles or their immediate environment. **AII**

b) Hygiene Measures to Minimize Influenza Transmission

1. Child care workers, children and their families should be encouraged to minimize potential influenza transmission through good hygienic measures, i.e. use disposable, one-use tissues for wiping noses; covering nose and mouth when sneezing and coughing; handwashing/hand antiseptics after coughing, sneezing or using tissues; and the importance of keeping hands away from the mucous membranes of the eyes and nose.

AIII

c) Masks

1. Wearing masks, when face-to-face with coughing children/individuals, to minimize influenza transmission during a pandemic will not be practical or helpful when transmission has entered the community.

BIII

d) Staff/Child Management

Child care settings may be closed depending on the epidemiology of the pandemic strain, e.g., severity of infection, high attack rates and severe complications (see Section 5.).

1. Children:

- a. When pandemic phase 2 has been declared (see Appendix II), do not send children to day care if at all possible until the pandemic phase has ended; the child has recovered from ILI (see Glossary for definition, Appendix IV for an ILI Assessment Tool) or the pandemic has gone through the child care centre.
- b. Do not send children with signs of ILI to day care and notify the day care of the reason for their absence (unless the pandemic has gone through the centre).
- c. Do not send children who have been exposed in the past 3 days to an individual with ILI, (unless the pandemic has gone through the centre), to day care.

AIII

2. Staff:

- a) Inform Public Health authorities of staff absence(s) due to ILI. Ideally, staff with ILI should not go to work until their symptoms have resolved.

AIII

5.4 Management of Pandemic Influenza in Schools and Student Residences

Risk of influenza transmission in schools can increase with crowded classrooms, poor ventilation and limited emphasis on hygienic practices. Dormitory living enhances this risk due to increased numbers of those considered to be household contacts.

Recommendations

a) Planning for Pandemic Influenza

1. Health Services in residence settings should develop an interpandemic influenza plan and review it annually. In addition, an Infection Control (IC) and Occupational Health (OH) Pandemic Influenza Plan should be developed as outlined in Section 3.1 and reviewed every 3 years.

Education should be provided, as outlined in Section 4.2.

b) Control of Pandemic Influenza

1. Immunization/Chemoprophylaxis

In the early phases of the pandemic, vaccine and antivirals may not be readily available. (See Annexes D and E of the Canadian Pandemic Influenza Plan).

2. Infection Control Practices

a. Hygiene Measures to Minimize Influenza Transmission

- i. Staff, students and their household members should recognize that strict adherence to hand washing/hand antisepsis recommendations is the cornerstone of infection prevention and may be the only preventative measure available during a pandemic. Hand hygiene procedures should be reinforced according to Appendix III.

AI

- ii. Hands should be washed or hand antisepsis performed after direct contact with individuals with ILI (see Glossary for definition, see Appendix IV for an ILI Assessment Tool) and after contact with their personal articles or their immediate environment.

AI

- iii. Staff, students and their household members should be encouraged to minimize potential influenza transmission through good hygienic measures, i.e., use disposable, one-use tissues for wiping noses; covering nose and mouth when sneezing and coughing; handwashing/hand antisepsis after coughing, sneezing or using tissues; and the importance of keeping hands away from the mucous membranes of the eyes and nose.

AI

b. Masks

- i. Wearing masks when face-to-face with coughing individuals to minimize influenza transmission during a pandemic will not be practical or helpful when transmission has entered the community.

BIII

c. Staff/Student Management

- i. Schools may be closed depending upon the epidemiology of the pandemic strain, e.g., severity of infection, high attack rates and severe complications (See Section 5.0).

AIII

- ii. When pandemic phase 2 is declared (see Appendix II) consider the following:

Students

- i. When pandemic phase 2 has been declared do not send students to school if at all possible until the pandemic phase has ended; the student has recovered from ILI (see Glossary for definition and Appendix IV for an ILI Assessment Tool) or, the pandemic has gone through the school.
- ii. Do not send students who have been exposed in the past 3 days to an individual with ILI to school unless the pandemic has already been through the school/ residence.

- iii. Do not send children with signs of ILI to school (unless the pandemic has gone through the school) and notify the school of the reason for their absence.
- iv. Well students should avoid contact with students who have ILI (e.g., not visit in rooms of symptomatic students).

AIII

Staff

- i. Inform Public Health authorities of absence(s) due to ILI.
- ii. Ideally, staff with ILI should not go to work until their symptoms have resolved.

AIII

Resident Health Services

- i. Assess symptomatic students according to an ILI Assessment Tool, see Appendix IV.
- ii. Encourage students with ILI who are well enough to remain in residence to remain in their room while symptomatic (e.g., not congregate in common areas).

AIII

5.5 Management of Pandemic Influenza in Workplaces

Planning for Pandemic Influenza

1. Provide education, as outlined in section 4.2 of Part A.

Control of Pandemic Influenza

A. Immunization/Chemoprophylaxis

1. Immunization will not be available to the general public in the early phases of the pandemic. See Annex D of the Canadian Pandemic Influenza Plan.

B. Hygiene Measures to Minimize Influenza Transmission

1. Workers and their household contacts should recognize that strict adherence to hand washing/hand antisepsis recommendations is the cornerstone of infection prevention and may be the only preventative measure available during a pandemic. Hand hygiene procedures should be reinforced according to Appendix III.
2. Hands should be washed or hand antisepsis performed after direct contact with individuals suspected of having or to have confirmed influenza and after contact with their personal articles or their immediate environment.
3. Workers and their household members should be encouraged to minimize potential influenza transmission through good hygienic measures, i.e., using disposable, one-use tissues for wiping noses; covering nose and mouth when sneezing and coughing; handwashing/hand antisepsis after coughing, sneezing or using tissues; and understanding the importance of keeping hands away from the mucous membranes of the eyes and nose.

AI

AI

AIII

Masks

1. When face-to-face with coughing individuals, wearing masks to minimize influenza transmission during a pandemic will not be practical or helpful when transmission has entered the community.

BIII

Education

1. Provide education, as outlined in Section 4.2 of Part A.

5.6 Management of Pandemic Influenza in Shelters

The risk of influenza transmission in a shelter setting during a pandemic will be high because of the crowded physical conditions, inadequate health and hygiene of clients and the reduced priority for immunization or chemoprophylaxis in this population.

A comprehensive infection prevention and control program forms the basis for a successful pandemic influenza plan. The promotion of hand washing and hygienic practices is imperative to minimize the transmission of influenza and other infectious diseases in the shelter with or without availability of immunization or chemoprophylaxis during a pandemic. Guidelines for Infection Control in shelters have been published⁷⁸⁻⁸¹.

Recommendations

Planning for Pandemic Influenza

1. Designate one person responsible for the infection control program^{78,80} and liaise with local public health. The program should prevent or minimize the occurrence and transmission of communicable diseases such as influenza^{79,81}.
2. An interpandemic influenza plan should be developed and reviewed annually. In addition, an Infection Control and Occupational Health Pandemic Influenza Plan should be developed as outlined in Section 3.1 and reviewed every 3 years.
3. Shelters that are in the process of being planned should pay special attention to the number and placement of hand washing sinks and methods to reduce overcrowding^{80,81}.
4. Provide education, as outlined in Section 4.2.

AIII

AIII

Control of Pandemic Influenza

A. Immunization/Chemoprophylaxis

1. Immunization may not be readily available to this setting in the early phases of the pandemic (See Annexes D and E of the Canadian Pandemic Influenza Plan).

B. Infection Control Practices

Hygiene Measures to Minimize Influenza Transmission

1. Workers and clients should recognize that strict adherence to hand washing/hand antisepsis recommendations is the cornerstone of infection prevention and may be the only preventative measure available during a pandemic.

When planning for a pandemic, operators should ensure that adequate supplies of hand hygiene products is a high priority as there may be an interruption to the supply or shortages of soap and hand towels.

Hand hygiene procedures should be reinforced according to Appendix III.

AII

2. Hands should be washed or hand antisepsis performed after direct contact with individuals with ILI (see Glossary for definition, see Appendix IV for an ILI Assessment Tool) and after contact with their personal articles or their immediate environment.

AII

3. Workers and clients should be encouraged to minimize potential influenza transmission through good hygienic measures, i.e., use disposable, one-use tissues for wiping noses; covering nose and mouth when sneezing and coughing; handwashing/hand antisepsis after coughing, sneezing or using tissues; and the importance of keeping hands away from the mucous membranes of the eyes and nose.

AII

Masks

1. When face-to-face with coughing individuals, wearing masks to minimize influenza transmission during a pandemic will not be practical or helpful when transmission has entered the community (also see Section 2.6).

BIII

Triage

1. Clients and workers with influenza-like illness should be assessed using an ILI Assessment Tool, (see Appendix IV).

AIII

5.7 Management of Pandemic Influenza in Correctional Facilities

A comprehensive infection prevention and control program forms the basis for a successful pandemic influenza plan. Adherence to infection prevention and control policies and procedures is imperative to minimize the transmission of influenza and other infectious diseases with or without the availability of immunization or chemoprophylaxis.

Planning for Pandemic Influenza

1. Designate one person responsible for the infection control program and liaise with local public health authorities. The program should prevent or minimize occurrence and transmission of communicable diseases such as influenza.
2. Develop an interpandemic influenza plan and review it annually. In addition, an Infection Control and Occupational Health Pandemic Influenza Plan should be developed, as outlined in Section 3.1 and reviewed every 3 years.

AIII

AIII

3. See Section 3.5 for Occupational Health management of correctional workers.

AIII

4. When Pandemic Phase 2 is declared (see Appendix II), provide additional education to health care workers and inmates, as outlined in Section 4.0.

AIII

Control of Pandemic Influenza

A. Immunization/Chemoprophylaxis

1. In the early phases of the pandemic, vaccine and antivirals may not be readily available. Essential service workers (including correctional officers) will be given high priority for immunization when vaccine is available. See Annexes D and E of the Canadian Pandemic Influenza Plan.

B. Infection Control Practices

1. Adhere to published infection control recommendations for correctional settings.

AIII

Hygiene Measures to Minimize Influenza Transmission

1. Workers and inmates should recognize that strict adherence to hand washing/hand antisepsis recommendations is the cornerstone of infection prevention and may be the only preventative measure available during a pandemic.

When planning for a pandemic, administrators should make ensuring adequate supplies of hand hygiene products a priority as there may be an interruption to the supply or shortages of soap and hand towels. Hand hygiene procedures should be reinforced according to Appendix III.

AII

2. Hands should be washed or hand antisepsis performed after direct contact with individuals with suspected or confirmed influenza and after contact with their personal articles or their immediate environment.

AII

3. Workers and inmates should be encouraged to minimize potential influenza transmission through good hygienic measures, i.e., use disposable, one-use tissues for wiping noses; covering nose and mouth when sneezing and coughing; hand washing/hand antisepsis after coughing, sneezing or using tissues; and the importance of keeping hands away from the mucous membranes of the eyes and nose.

AIII

Masks

1. Wearing masks when face-to-face with coughing individuals to minimize influenza transmission during a pandemic will not be practical or helpful when transmission has entered the community (also see Section 2.6).

BIII

Triage/Cohorting

1. Provide a separate triage area to assess inmates and workers with ILI (see Glossary) according to an ILI Assessment Tool, (see Appendix IV).

BIII

2. Place inmates with ILI in cohort units/areas whenever possible. Good hygiene should be emphasized.

BIII

Visitors

1. Visitors with febrile respiratory illness should be discouraged from visiting if there is no pandemic activity in the facility.

AIII

2. Visitors should be made aware of pandemic activity in the facility and discouraged from visiting unless they have recovered from ILI or been immunized against the pandemic strain of influenza.

AIII

Infection Control and Occupational Health in Non Traditional Settings during an Influenza Pandemic

1.0 Infection Control and Occupational Health in Triage Settings

Upon declaration of WHO pandemic phase 2 (see Appendix II), triage settings will be established in locations as predetermined in the Canadian Pandemic Influenza Plan. The purpose of triage settings is to facilitate efficient and consistent assessment for those with influenza-like illness (ILI) (see Glossary for definition and see Appendix IV for an ILI Assessment Tool).

It is important to note that the influenza virus can survive on hands for 5 minutes following the transfer from environmental surfaces¹⁴. **The importance of hand washing/hand antisepsis during a pandemic cannot be overemphasized. See Appendix III.** Hand washing/hand antisepsis is the single most important method to prevent the transmission of infection including influenza and will be even more important because of the unavailability of influenza vaccine and antiviral prophylaxis early, during or even late in the pandemic.

There is evidence that overcrowding has contributed to the transmission of respiratory transmitted infections⁸². Crowding and breathing recycled air were identified as risk factors for influenza transmission in a grounded airplane¹⁸ and in a long term care facility⁸³.

Recommendations

1.1 Prevention of Pandemic Influenza

A. Immunization and Antivirals

Adherence to the recommendations for vaccine and antivirals for patients and HCWs, as outlined in Annexes D and E of the Canadian Pandemic Influenza Plan, is required.

1.2 Control of Pandemic Influenza

A. Physical Setting

1. When Pandemic Phase 2 is declared (see Appendix II), open triage settings in hospitals and community locations as predetermined in the Preparedness Section of the Canadian Pandemic Influenza Plan.

AIII

2. When planning for the location of a triage setting, emphasize the need for spatial separation between patients, those accompanying them and care givers/triage workers.

AI

- a. Ideally, triage settings should only be placed in an area that has a well maintained ventilation system.

AI

- b. Prevent crowding in triage settings by ensuring ample room is available in waiting and assessment areas in order to maintain spatial separation of at least 1 metre.

AI

- c. Consider the need for a separate area for temporary storage of deceased bodies.

AIII

B. Management of Staff

1. Adhere to Occupational Health Management, as outlined in Section 3.5.
2. Provide education, according to Section 4.1 of Part A.

C. Infection Control Practices

1. Hygiene Measures to Minimize Influenza Transmission

- a. Patients, staff and visitors should minimize potential influenza transmission through good hygienic measures, i.e., use disposable, one-use tissues for wiping noses; covering nose and mouth when sneezing and coughing; handwashing/hand antiseptics after coughing, sneezing or using tissues; and the importance of keeping hands away from the mucous membranes of the eyes and nose.

AIII

- b. To prevent nosocomial infections, triage settings should adhere to published guidelines^{6,9,84}. Infection Control Practices adapted from Health Canada Infection Control Guidelines *Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care*⁵ and *Hand Washing, Cleaning, Disinfection and Sterilization in Health Care*³ are summarized below:

2. Hand Hygiene

- a. Staff, patients and visitors should recognize that strict adherence to hand hygiene recommendations is the cornerstone of infection prevention and may be the only preventative measure available during a pandemic.

Hand hygiene procedures should be reinforced according to Appendix III.

AI

- b. Hands should be washed or hand antiseptics performed after direct contact with ILI patients and after contact with their personal articles or their immediate environment.

AI

- c. Ideally, hand washing facilities should be conveniently located throughout the triage setting. Sinks for hand washing should be used only for hand washing and not for any other purpose, e.g., as a utility sink. There should be access to adequate supplies and soap and towel dispensers in good working order, or liberal use of waterless hand antiseptic agents⁸⁵⁻⁸⁷.

BII

- d. Plain soap may be used for routine hand washing^{88,89}. **BII**
- e. Hand antisepsis with an antiseptic soap or antiseptic hand rinse is indicated^{88,90} before performing invasive procedures such as starting an intravenous (maximal barrier technique in addition to hand antisepsis is required for insertion of central lines). **BIII**
- f. When access to sinks is limited, antiseptic hand rinses should be used. Waterless antiseptic hand rinses are superior to soap and water in reducing hand contamination^{66-68,91} and should be made available. **AIII**
- g. When there is visible soiling, hands should be washed with soap and water before using waterless antiseptic hand rinses. If soap and water are unavailable, cleanse hands first with detergent-containing towelettes⁹². **BIII**
- h. Health Care Workers can reduce the frequency of hand washing required by minimizing unnecessary direct contact with patients and their immediate environments. **BIII**
- i. Hands must be washed^{93,94}:
 - i. between patients,
 - ii. after contact with blood, body fluids, secretions (e.g., respiratory secretions),
 - iii. after contact with items known or considered likely to be contaminated with blood, body fluids, secretions (e.g., respiratory secretions), or excretions,
 - iv. immediately after removing gloves⁴⁶,
 - v. between certain procedures on the same patient in which soiling of hands is likely, to avoid cross-contamination of body sites^{91,95},
 - vi. when hands are visibly soiled. **AII**
- j. Hand lotion may be used to prevent skin damage from frequent hand washing⁹⁶. Lotion should be supplied in disposable bags in wall containers by sinks or in small, non-refillable containers to avoid product contamination. Inappropriate handling and management of skin lotions for patient's and care giver's use have been reported as sources of outbreaks⁹⁷⁻¹⁰¹. **BII**
- k. Liquid hand wash products should be stored in closed containers and dispensed from either disposable containers or containers that are washed and dried thoroughly before refilling. **AII**

3. Personal Protective Equipment

- a. Masks, Eye Protection and Face Shields
 - i. Masks and eye protection, or face shields should be worn by triage personnel to prevent the transmission of influenza when face-to-face with individuals for ILI assessment. **BIII**

ii. Masks and eye protection, or face shields should be worn by triage personnel to prevent exposure to sprays of blood, body secretions or excretions. Surgical masks are considered adequate for this purpose^{9,44,45}.

BIII

iii. HCWs should avoid touching their eyes with their hands to prevent self-contamination with pathogens.

iv. Masks should be worn by triage personnel to prevent the transmission of other organisms when HCWs are face-to-face with undiagnosed coughing patients.

BIII

v. Wear masks, as outlined in Section 2.6.

b. Gloves

i. Gloves are not required for the routine care of patients suspected of or confirmed to have influenza. Meticulous hand washing with soap and water or performing hand antisepsis will inactivate the virus.

AIII

ii. Appropriate use of clean, non-sterile gloves includes^{9,44,102-105}:

a. for contact with blood, body fluids, secretions (e.g., respiratory secretions) and excretions, mucous membranes, draining wounds or non-intact skin (open skin lesions or exudative rash);

b. when handling items visibly soiled with blood, body fluids, secretions (e.g., respiratory secretions) and excretions;

c. when the health care worker has open skin lesions on the hands.

AII

iii. Gloves should be used as an additional measure, not as a substitute for hand washing^{46,47}.

BII

iv. When indicated, gloves should be put on directly before contact with the patient or before the procedure requiring gloves^{95,106,107}.

AII

v. Potentially contaminated gloves should be removed and disposed of immediately after completion of care, procedure or specific task, at the point of use prior to touching clean environmental surfaces (e.g., blood glucose or temperature machines, blood pressure cuffs)^{46,95,106-108}.

AII

vi. Hands should be washed immediately after removing gloves^{46,47}.

AII

vii. Single-use disposable gloves should not be reused or washed⁴⁶.

AII

c. Gowns

i. Gowns are not required for the routine care of patients suspected of having or confirmed to have influenza.

AI

- ii. Long sleeved gowns should only be used to protect uncovered skin and prevent soiling of clothing during procedures and patient care activities likely to generate splashes or sprays of blood, body fluids, secretions or excretions^{9,45}.

BIII

- iii. HCWs should ensure any open skin areas/lesions on forearms or exposed skin are covered with a dry dressing at all times. Intact skin that has been contaminated with blood, body fluids, secretions or excretions should be washed as soon as possible, thoroughly but gently with soap and warm running water.

BIII

4. Environmental Control (Patient Care Equipment, Housekeeping, Laundry and Waste)

The influenza virus survives well in the environment and patients may contaminate their environment with respiratory secretions. On hard porous surfaces the virus can survive for 24-48 hours, can then be transferred to hands and survive for up to 5 minutes¹⁴.

Equipment and surfaces (i.e., desks, arm rests, etc.) contaminated with secretions from patients suspected of having or confirmed to have influenza should be cleaned before use with another patient.

Recommendations

a. Process

- i. “Parent” organizations must provide a specially trained, knowledgeable person to be responsible for the reprocessing patient care equipment, housekeeping, laundry and waste services. Where there is no “parent” organization to plan or operate the triage settings, it is expected another organization would assume this role.

AIII

- ii. Reprocessing (i.e., disinfection or sterilization) equipment is not recommended in the Triage Setting but if considered, the “parent” organization must provide a specially trained, knowledgeable person to be responsible for the processes. If soiled equipment is to be transported for disinfection or sterilization, the parent organization must develop processes for the separation of soiled and clean/sterile equipment and the safe handling/transport of contaminated equipment.

AIII

- iii. Procedures should be established for assigning responsibility and accountability for the routine cleaning of all patient care equipment¹⁰⁹⁻¹¹² and housekeeping services.

BIII

- iv. Reuse of single use items is strongly discouraged.

AI

b. Patient Care Equipment (Cleaning, Disinfection and Storage)

- i. Equipment that touches the patient’s intact skin should be clean. Equipment that is shared should be cleaned between patients. A hospital grade germicide should be used for routine cleaning. Please refer to Appendix V, Table A Cleaning Procedures for Common Items.

BIII

- ii. Equipment that is visibly soiled should be cleaned promptly.

BIII

- iii. Soiled equipment should be handled in a manner that prevents exposure of the skin and mucous membranes and contamination of clothing and the environment. **BIII**
 - iv. Reuseable equipment touching mucous membranes, e.g., respiratory therapy equipment or equipment contacting non-intact skin, should be discarded or it should be treated appropriately using high level disinfectant between patients^{3,113-116}. **AIII**
 - v. Reuseable equipment must be thoroughly cleaned (washed with hot soapy water, using an enzymatic cleaner), rinsed and dried before disinfection or sterilization¹¹⁷ and dried before storage. **AII**
 - vi. Manufacturers' written recommendations for use of chemical disinfectant should be strictly followed.
 - vii. Only disinfectants with a DIN (disinfectants approved for use in Canada) should be used.
 - viii. Sterile items must remain sterile until they are used¹¹⁸⁻¹²⁰. **AII**
 - ix. Sterile and clean supplies should be stored in a clean dry area. **AII**
- c. Housekeeping
- i. Surfaces that are frequently touched by the hands (i.e., contaminated) of health care providers and patients/residents/clients, such as the surfaces of medical equipment and knobs for adjustment or opening, should be cleaned at least twice daily and when known to be contaminated, i.e., after use¹²¹⁻¹²³. **BIII**
 - ii. Careful vigorous cleaning of environmental surfaces is effective in removing many contaminants from surfaces. **AII**
 - iii. A barrier (sheet or paper) should be placed on the examining or procedure table and changed between patients. Alternatively, the table should be cleaned between patients. **BIII**
- d. Laundry (linen)
- i. When reusable linen is used, it should be changed between patients. Special handling of linen contaminated with secretions from patients suspected of having or confirmed to have influenza is not required. **AII**
- e. Waste
- i. Special handling of waste contaminated with secretions from patients with suspected or confirmed influenza is not required. **AII**
 - ii. Used needles and other sharp instruments should be handled with care to avoid injuries during disposal or reprocessing. Used sharp items should be disposed of in designated puncture-resistant containers located in the area where the items were used^{9,124,125}. **AIII**

5. Care of the Deceased

Attention to routine infection prevention and control practices is sufficient for handling bodies of individuals who have died from influenza. There is no additional risk of transmission of influenza infection.

Recommendations

- i. Adherence to routine infection control practices for hand washing/hand hygiene, mask/eye protection/face shields, glove and gown use, as outlined above for handling a deceased body, is highly recommended. AIII

- ii. The body of the deceased should be placed in a body bag or wrapped in a sheet when a body bag is unavailable and, preferably, kept in a cool, dry location until picked up by funeral services. AIII

2.0 Infection Prevention and Control in Self Care Settings (Care provided by Self, Family or Friends/Volunteers)

Providing care to an individual with influenza like-illness (ILI) who is well enough to be cared for at home will be common during an influenza pandemic. Care may be provided by family members, neighbors, volunteers or individuals themselves. Therefore, adapting Routine Practices to the home setting to prevent transmission of other infections (including blood borne pathogens) to those providing care is necessary.

It is important to note that the influenza virus can survive on hands for 5 minutes following the transfer from environmental surfaces¹⁴. **The importance of hand washing/hand antisepsis during a pandemic cannot be overemphasized. See Appendix III.** Hand washing/hand antisepsis is the single most important method to prevent the transmission of infection including influenza and will be even more important because of the unavailability of influenza vaccine and antiviral prophylaxis early, during or even late in the pandemic.

Recommendations

2.1 Prevention of Pandemic Influenza

A. Immunization and Antivirals

Adherence to recommendations for vaccine and antivirals for patients and individuals providing self care as outlined in Annexes D and E of the Canadian Pandemic Influenza Plan.

2.2 Control of Pandemic Influenza

A. Physical Setting

1. When Pandemic Phase 2 is declared (see Appendix II), Triage Settings will be opened as indicated in the Preparedness Section of the Canadian Pandemic Influenza Plan. Patients with influenza-like-illness (ILI) (see an ILI Assessment Tool, Appendix IV) not directed to hospital or temporary influenza settings will be provided with Self Care guidelines. **AIII**
2. In the home setting, it is recommended that an attempt be made to maintain spatial separation of one metre unless providing direct care. Where feasible, the individuals with ILI (see glossary) should stay in their room. **BII**
3. In a household where well (non-ILI) individuals (e.g., an elderly or immunocompromised person, or an infant) require care, it is important to provide their care prior to caring for individuals with ILI. **AIII**

B. Management of Individuals Involved in Self Care

1. Provide education as outlined in Section 4.2 of Part A.

C. Infection Control Practices

To prevent the transmission of infections, individuals providing care should adhere to the following recommendations adapted from *Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care*⁵ and *Hand Washing, Cleaning, Disinfection and Sterilization in Health Care*³.

1. Hand Hygiene
 - a. Wash hands before, and after, the care of the individual who has ILI. See Appendix III. **AII**
 - b. Plain soap may be used for hand washing^{88,89}. Soaps containing antiseptics are not required. **BII**
 - c. Bar soap should be stored in such a manner as to allow for drying after use. Liquid hand wash products should be stored in clean closed containers and dispensed from either disposable containers or containers that are washed and dried thoroughly before refilling. **AII**
 - d. A waterless antiseptic hand rinse for hand hygiene should be used if hand washing facilities (sink and running water) are inaccessible^{66-68,91}. If there is visible soiling of the hands, first wipe with detergent containing towelettes, then use the antiseptic hand rinse⁹². **AI**
2. Personal Protective Equipment
 - a. Masks, Eye Protection and Face Shields
 - i. Masks to prevent the transmission of influenza are not helpful when transmission has entered the community. **BIII**

ii. Wear masks and eye protection, or face shields to protect the mucous membranes of the eyes, nose and mouth during procedures and care activities that are likely to generate splashes or sprays of blood, body fluids, secretions or excretions^{9,44,45}.

BIII

iii. Avoid touching the eyes with the hands to prevent self-contamination with pathogens.

iv. Wear masks, as outlined in Section 2.6.

b. Gloves

i. Gloves are not routinely necessary in the care of an individual with ILI. Hand washing is sufficient.

AIII

ii. Gloves are an additional measure to protect hands from soiling with secretions and excretions but are not a substitute for hand washing.

AIII

iii. Individuals should avoid touching the mucous membranes of their eyes and mouth with their hands; especially when providing care to individuals with ILI.

AIII

iv. Dishwashing or utility household gloves may be worn in place of single-disposable medical gloves. They should be used by one individual only and washed and dried between use.

AIII

v. Single-use disposable medical gloves should not be reused or washed⁴⁷.

AII

vi. Single use plastic bags can also be used as gloves to protect hands from gross soiling.

AIII

vii. Appropriate use of clean non-sterile gloves includes the following^{9,44,102,103,105}:

- a. for contact with blood, body fluids, secretions and excretions, mucous membranes, draining wounds or non-intact skin (open lesion or oozing rash),
- b. when handling items visibly soiled with blood, body fluids, secretions and excretions,
- c. when the care provider has open skin lesions on the hands.

AII

viii. Gloves should be removed immediately after completion of the procedure for which they were worn and before touching clean environmental surfaces^{95,106,107}.

AII

iv. Hands should be washed immediately after removing gloves^{46,47}. If no gloves are available, plastic bags may be worn as gloves.

AI

c. Gowns

i. Over-garments such as aprons, or gowns are not required for the care of an individual with ILI.

AI

ii. Over-garments should be used to protect uncovered skin and prevent soiling of clothing during procedures and patient care activities likely to generate splashes or sprays of blood, body fluids, secretions or excretions^{9,45} (also see laundry instructions below).

BIII

iii. Caregivers should ensure any open skin areas/lesions on forearms or exposed skin are covered with a dry dressing at all times. Intact skin that has been contaminated with blood, body fluids, secretions or excretions should be washed as soon as possible, thoroughly, but gently, with soap and warm running water.

BIII

3. Environmental Control (Housekeeping, Laundry and Waste)

The influenza virus survives well in the environment and patients may contaminate their environment with respiratory secretions. On hard porous surfaces the virus can survive for 24-48 hours, can then be transferred to hands and survive for up to 5 minutes¹⁴. Equipment and surfaces contaminated with secretions from patients suspected of having or confirmed to have influenza should be cleaned before use with another individual.

a. Housekeeping

i. Environmental surfaces and objects that have been touched by an individual with ILI or the caregiver should be cleaned daily with a regular household cleaning agent.

AII

ii. Products that are labeled “antibacterial” are not necessary.

AIII

b. Laundry

i. Special handling of clothing or linen used during the care of an individual with ILI is not necessary.

BIII

ii. Heavily soiled linen should be rolled or folded to contain the heaviest soil in the centre of the bundle^{126,127}. Large amounts of solid soil, feces, or blood clots should be removed from linen with a gloved hand and toilet tissue then placed into a bed pan or toilet for flushing. In order to prevent splashing, excrement (e.g., from clothing, reusable incontinence pads) should not be removed by spraying with water.

BIII

iii. Use of a commercial laundry detergent with household bleach (according to product instructions and where suitable for fabrics) and a normal machine wash and machine dry are sufficient to clean soiled linen in a home care setting^{50,128-131}.

BIII

iv. Machine drying or hanging clothing and linens on a clothes line at the home care site is a suitable method for drying.

BIII

c. Waste

i. Garbage generated during the care of an individual with ILI does not require special handling and may be placed with household waste for disposal.

AIII

- ii. Medical sharps, i.e hypodermic needles used in the care of an individual with ILI should be placed in an impervious container (e.g., coffee can) with household waste prior to disposal.

AI1

4. Care of the Deceased

Attention to routine infection prevention and control practices is sufficient for handling bodies of individuals who have died from influenza. There is no additional risk of transmission of influenza infection.

Recommendations

- a. Adherence to the routine infection control practices for hand washing/hand hygiene, mask/ eye protection/face shields, glove and gown use as outlined above during the care of the deceased body is recommended.
- b. Individuals who die in a home setting should be wrapped in a sheet (ideally using a plastic bag to protect the mattress) and preferably kept in a cool, dry location until pick up by funeral services.

AIII

AIII

3.0 Infection Control and Occupational Health in Temporary Influenza Hospitals

Patients triaged as unable to be cared for at home and not ill enough for an acute care hospital will be sent to Temporary Influenza Hospitals as predetermined in the Canadian Pandemic Influenza Plan. Therefore, patients in these settings will either be ill with the pandemic strain of influenza or will have recovered from the pandemic strain of influenza; thus, patient-to patient transmission of influenza will not be a concern. In this setting, the risk of acute infections other than influenza (e.g., gastroenteritis, other respiratory infections, ectoparasites) will be of concern. Adherence to current Infection Control Guidelines to prevent the transmission of infection is required^{3,5,6,9,84}.

It is important to note that the influenza virus can survive on hands for up to 5 minutes following the transfer from environmental surfaces¹⁴. **The importance of hand washing/hand antisepsis during a pandemic cannot be overemphasized. See Appendix III.** Hand washing/hand antisepsis is the single most important method to prevent the transmission of infection including influenza and will be even more important because of the unavailability of influenza vaccine and antiviral prophylaxis early, during, or even late, in the pandemic.

Maintaining spatial separation of at least 1 metre between patients in this setting should be maintained because there is evidence that overcrowding has contributed to the spread of respiratory-transmitted infections⁸².

Recommendations

3.1 Prevention of Pandemic Influenza

A. Immunization and Antivirals

Adherence to the recommendations for vaccine and antivirals for patients and HCWs, as outlined in Annexes D and E of the Canadian Pandemic Influenza Plan, is vital.

3.2 Control of Pandemic Influenza

A. Physical Setting

1. When Pandemic Phase 2 is declared (see Appendix II), open Temporary Influenza Hospitals as predetermined in the Canadian Pandemic Influenza Plan. **AIII**
2. When planning for the location of a temporary influenza hospital, emphasize the need for spatial separation between patients, their families and care givers. **AI**
3. Maintain at least a 1 metre spatial separation between beds in patient care areas and chairs in waiting areas⁸². **AI**
4. Plan for separate soiled and clean utility rooms; clean storage areas; dedicated sinks for utility purposes versus hand washing; designate food preparation areas including, dedicated utility versus hand washing sinks; provide an adequate number of toilets; set place for a bereavement room and a location to store deceased bodies prior to pick up for funeral services. **AI**
5. Settings with carpeted floors are discouraged. **BIII**

B. Management of Staff

1. Provide education, as outlined in section 4.1.
2. Adhere to Occupational Health Management, as outlined in Section 3.5.

C. Infection Control Practices

1. Hygiene Measures to Minimize Influenza Transmission
 - a. Temporary Influenza hospitals should adhere to published guidelines^{3,6,9} to prevent nosocomial infections. Infection Control Practices adapted from Health Canada Infection Control Guidelines *Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care*⁵ are summarized below:
 - b. Patients, staff and visitors should minimize potential influenza transmission through good hygienic measures, i.e., using disposable, one-use tissues for wiping noses; covering nose and mouth when sneezing and coughing; hand washing/hand antiseptics after coughing,

sneezing or using tissues; and keeping their hands away from the mucous membranes of the eyes and nose.

AIII

2. Hand Hygiene

a. Staff, patients and visitors should recognize that strict adherence to hand washing/hand antisepsis recommendations is the cornerstone of infection prevention and may be the only preventative measure available during a pandemic. Hand hygiene procedures should be reinforced according to Appendix III.

AII

b. Hands should be washed or hand antisepsis performed after direct contact with ILI patients (see Glossary) and after contact with their personal articles or their immediate environment.

AII

c. When planning for the location and operation of a Temporary Influenza Hospital, it is important to note that, ideally, hand washing facilities should be conveniently located.

Note: See g. below if hand washing facilities are not available.

BII

d. Hand washing facilities should be available in, or adjacent to rooms where care is provided. If a large room is used for several patients, more than one sink may be necessary. Sinks for hand washing should be used only for hand washing and not for other purposes, e.g., as a utility sink. There should be access to adequate supplies as well as soap and towel dispensers should be in good working order⁸⁵⁻⁸⁷.

BII

e. To avoid re-contaminating hands, single-use towels should be supplied for users to turn off faucets.

BIII

f. Plain soap may be used for routine hand washing^{89,132}.

BII

g. When access to sinks is limited, supplies of antiseptic hand rinses and detergent containing towelettes are necessary. Waterless antiseptic hand rinses are superior to soap and water in reducing hand contamination^{66-68,91} and should be made available in prominent areas throughout the temporary hospital.

AI

h. If there is visible soiling, hands should be washed with soap and water before using waterless antiseptic hand rinses. If soap and water are unavailable, cleanse hands first with detergent-containing towelettes⁹².

BIII

i. Health Care Workers can reduce the required frequency of hand washing by minimizing unnecessary direct contact with patients and their immediate environments. This can be accomplished by the organization of care activities and avoiding touching surfaces in the patient's environment, e.g., bedrails, tabletops.

BIII

j. Hands must be washed^{93,94} or antiseptic hand rinse used in the following situations:

i. after any direct contact with a patient or their immediate environment and before contact with the next patient;

- ii. after contact with items known or considered likely to be contaminated with blood, body fluids, secretions, or excretions (e.g., bedpans, urinals, wound dressings, suction apparatus);
- iii. immediately after removing gloves⁴⁶;
- iv. between certain procedures on the same patient if soiling of hands is likely, to avoid cross-contamination of body sites^{91,95};
- v. before preparing, handling, serving or eating food and before feeding a patient;
- vi. when hands are visibly soiled; and,
- vii. after personal use of toilet, wiping nose, coughing or sneezing.

AI

- k. Patients and family members and visitors should be taught how and when to wash their hands, e.g., after personal use of toilet, wiping nose, coughing or sneezing.

AI

- l. When patient hygiene is poor, they should have their hands washed for them. Patients should be helped to wash their hands before meals, after going to the bathroom, when soiled and before leaving their bedspace.

BIII

- m. Hand antisepsis, with an antiseptic soap or antiseptic hand rinse, is indicated before performing invasive procedures^{92,132}.

BIII

- n. Hand lotion may be used to prevent skin damage from frequent hand washing⁹⁶. Lotion should be supplied in disposable bags in wall containers by sinks or in small, non-refillable containers to avoid product contamination. Inappropriate handling and management of patients' or care givers' skin lotions have been reported as a source of outbreaks⁹⁷⁻¹⁰¹.

BII

- o. Liquid hand-wash products should be stored in closed containers and dispensed from either disposable containers or containers that are washed and dried thoroughly before refilling.

AI

3. Personal Protective Equipment

a. Masks, Eye Protection, and Face Shields

- i. Masks to minimize the transmission of influenza may be worn when face-to-face with coughing individuals in during the early phases of the pandemic but are not practical, or helpful, when transmission has entered the community and temporary hospitals have been opened.

BIII

- ii. Masks should be worn in the temporary influenza hospital to prevent the transmission of other organisms when HCWs are face-to-face with undiagnosed coughing patients.

BIII

- iii. Masks and eye protection, or face shields should be worn to prevent HCW exposure to sprays of blood, body secretions or excretions. Surgical masks are considered adequate for this purpose^{9,44,45}.

BIII

- iv. HCWs should avoid touching their eyes with their hands to prevent self-contamination with pathogens.

v. Wear masks, as outlined in Section 2.6.

b. Gloves

i. Gloves are not required for the routine care of patients suspected of having or confirmed to have influenza. Meticulous hand washing with soap and water or performing hand antisepsis will inactivate the virus.

AIII

ii. Gloves should be used as an additional measure, not as a substitute for hand hygiene^{46,47}.

BII

iii. Gloves are not required for routine patient care activities in which contact is limited to a patient's intact skin, e.g., when transporting patients.

BIII

iv. Appropriate use of clean non-sterile gloves includes the following situations^{9,44,102-105}:

- a. for contact with blood, body fluids, secretions and excretions, mucous membranes, draining wounds or non-intact skin (open skin lesions or oozing rash);
- b. for handling items visibly soiled with blood, body fluids, secretions or excretions;
- c. when the health care worker has open skin lesions on the hands.

AII

v. When indicated, gloves should be put on directly before contact with the patient or just prior to starting the task or procedure requiring gloves^{95,106,107}.

AII

vi. Gloves should be changed between care activities and procedures with the same patient after contact with materials that may contain high concentrations of microorganisms^{46,95}, e.g., after handling an indwelling urinary catheter.

BIII

vii. Worn gloves should be changed:

- a. between patient contacts,
- b. if a leak is suspected or the glove tears.

AII

viii. Potentially contaminated gloves should be removed and disposed of immediately after completion of care or a specific task, at the point of use prior to touching clean environmental surfaces (e.g., blood glucose or temperature machines, blood pressure cuffs)^{46,95,106,107,133}.

AII

ix. Hands should be washed immediately after removing gloves^{46,47}.

AII

x. Single-use disposable gloves should not be reused or washed⁴⁷.

AII

c. Gowns

i. Gowns are not required for the routine care of patients with suspected or confirmed to have influenza.

AI

- ii. Long sleeved gowns should only be used to protect uncovered skin and prevent soiling of clothing during procedures and patient care activities likely to generate splashes or sprays of blood, body fluids, secretions or excretions^{9,45}.

BIII

- iii. HCWs should ensure any open skin areas/lesions on forearms or exposed skin are covered with a dry dressing at all times. Intact skin that has been contaminated with blood, body fluids, secretions or excretions should be washed as soon as possible thoroughly, but gently, with soap and warm running water.

BIII

D. Patient Activity Restrictions

1. There are no patient activity restrictions as patients and staff will have already been exposed to or infected with influenza.

AIII

E. Visitor Restrictions

1. Notices should be placed at the entrances to the temporary hospital:
 - a. warning visitors that they may be at risk of acquiring influenza and requesting visitors who have not had influenza-like-illness not to visit. Close relatives of terminally ill patients are exempt.
 - b. requiring that visitors with acute respiratory illness not visit as other respiratory illness may be circulating.

AIII

F. Patient Care Equipment (Cleaning, Disinfection and Sterilization)

Sterilization and high-level disinfection requires supervision by a trained professional, dedicated space and specialized equipment. Items requiring sterilization or high level disinfection should be disposable or managed by the “parent” organization.

The appropriate cleaning, disinfection sterilization, storage and handling of patient care equipment is an obligatory component of health care and cannot be overemphasized. Equipment and surfaces contaminated with secretions from patients suspected of having or confirmed to have influenza should be cleaned before use with another patient. The following recommendations apply in all circumstances. Please refer to the Glossary for definition of terms.

Recommendations

1. Process
 - a. Reprocessing equipment (i.e., disinfection or sterilization) is not recommended but, if considered, the “parent” organization must provide a specially trained, knowledgeable person to be responsible for the processes. Where there is no “parent” organization to plan or operate the Temporary Influenza Hospital, it is expected that another organization would assume this role. If soiled equipment is to be transported for disinfection or sterilization, the parent organization must develop processes for the separation of soiled and clean/sterile equipment and safe handling/transport of contaminated equipment.

AIII

b. Procedures should be established for assigning responsibility and accountability for routine cleaning of all patient care equipment^{109,111,112,134}.

BIII

c. . Reuse of single use items in this setting is strongly discouraged.

AII

2. Cleaning

a. Items that are shared, should be cleaned between patients. A hospital grade germicide should be used for routine cleaning. Please see Appendix V, Table A *Cleaning Procedures for Common Items*.

BIII

b. Reuseable items must be thoroughly cleaned before disinfection or sterilization¹³⁵⁻¹³⁷. Items should be washed with hot soapy water, using an enzymatic cleaner.

AII

c. Equipment that is visibly soiled should be cleaned promptly.

BIII

d. Soiled patient care equipment should be handled in a manner that prevents exposure of skin and mucous membranes and contamination of clothing and the environment.

BIII

e. Commodes and toilets should be cleaned twice daily and when soiled. Ideally, bedpans should be reserved for use by a single patient, labeled appropriately or cleaned between uses.

BIII

f. Personal care supplies (e.g., lotion, creams, soaps) should not be shared between patients.

BIII

3. Disinfection

a. Reuseable items must be adequately rinsed and dried before disinfection or sterilization and dried before storage.

AII

b. Manufacturers' written recommendations for the use of chemical disinfectant should be followed.

c. Only disinfectants with a DIN (disinfectants approved for use in Canada) should be used.

d. Respiratory therapy and anesthesia equipment require, at a minimum, high level disinfection¹¹³⁻¹¹⁶.

AIII

4. Sterilization

a. Critical items must be sterile¹³⁵.

AIII

b. The steam sterilization process must be monitored by biologic indicator testing at least daily¹³⁷.

AIII

c. The sterilization process must be monitored at each cycle by mechanical and chemical indicators¹¹⁸. Each pack must contain a chemical indicator¹³⁷.

AIII

- d. A procedure for the recall of items processed from a load that contained a positive biological indicator should be established and followed¹³⁷. AIII
 - e. Flash sterilization is not recommended. AIII
 - f. Microwave ovens, glass bead sterilizers and boiling for sterilization should not be used¹³⁸. AIII
5. Storage
- a. After reprocessing, sterility must be maintained until point of use¹¹⁸. AIII
 - b. Sterile items must be maintained sterile until use¹¹⁸⁻¹²⁰. AII
 - c. Sterile and clean supplies should be stored in a clean dry area. AII
 - d. Clean and sterile supplies should not be hoarded. AII
 - e. Soiled equipment should be kept physically separate from clean/sterile supplies and equipment. AII

G. Environmental Control (Housekeeping, Laundry and Waste)

The influenza virus survives well in the environment and patients may contaminate their environment with respiratory secretions. On hard porous surfaces the virus can survive for 24-48 hours, can then be transferred to hands and survive for up to 5 minutes¹⁴.

Equipment and surfaces (i.e., desks, arm rests, etc.) contaminated with secretions from patients suspected or confirmed to have influenza should be cleaned before use with another patient.

1. Housekeeping

Appropriate housekeeping is a required component of health care and cannot be over-emphasized. The following recommendations apply in all circumstances. Please refer to the glossary for a definition of terms.

Recommendations

- a. Process
 - i. “Parent” organizations must provide a specially trained, knowledgeable person responsible for housekeeping and the policies for cleaning schedules and methods.

When there is no “parent” organization to plan or operate the triage settings, it is expected another organization would assume this role. AIII
 - ii. Products and procedures should be aligned with, or approved by, the “parent” organization. AIII
 - iii. An education program for those providing housekeeping services should help them to understand the effective methods of cleaning and the importance of their work. BIII

- iv. Housekeepers, as with other health care workers, should be offered immunization against hepatitis B^{6,9}.

AII

b. Cleaning

- i. Daily cleaning of environmental surfaces and noncritical patient care items should be sufficient to keep surfaces clean and dust free¹²¹⁻¹²³. Surfaces that are frequently touched (i.e., contaminated) by the hands of health care providers and patients/residents/clients, such as surfaces of medical equipment and knobs for adjustment or opening, should be cleaned twice daily or when known to be contaminated.
- BIII**
- ii. Careful vigorous cleaning of environmental surfaces is effective in removing many contaminants from surfaces.
- AII**
- iii. Damp rather than dry dusting or sweeping should be performed, whenever possible, in order not to generate dust particles. Any dry cleaning should be done carefully with a chemically treated dry mop or vacuum cleaner (equipped with exhaust filter) rather than a broom. (Note: carpets are discouraged in this setting).
- BIII**
- iv. Vacuum cleaners, equipped with exhaust filters, should be used on carpeted areas. Expelled air from vacuum cleaners should be diffused so that it does not aerosolize dust from uncleaned surfaces.
- BIII**
- v. During wet cleaning, cleaning solutions and the tools with which they are applied soon become contaminated. Therefore, a routine should be adopted that does not redistribute microorganisms. This may be accomplished by cleaning less heavily contaminated areas first and also by changing cleaning solutions and cloth/mop heads frequently.
- BIII**
- vi. Wet mopping is most commonly done with a double-bucket technique, i.e., one bucket for soil, one for rinsing. This technique extends the life of the solution because fewer changes are required. When a single bucket is used, the solution must be changed more frequently because of increased soil.
- BIII**
- vii. Tools used for cleaning and disinfecting must be cleaned and dried between uses.
- BIII**
- viii. Mop heads should be laundered daily. All washed mop heads must be dried thoroughly before storage¹²¹ or reuse.
- BIII**

c. Cleaning agents

- i. In most areas, detergents are acceptable for surface cleaning. Please refer to Appendix V, Table A, Cleaning Procedures for Common Items.
- ii. Cleaning and disinfecting agents must be mixed and used according to manufacturers' recommendations.

AIII

iii. Protective apparatus: Household utility gloves should be worn during cleaning and disinfecting procedures. Manufacturers' directions should be followed for product use to ensure safe handling practices.

BIII

iv. Disinfectant fogging (spraying disinfectant in a closed area) is not necessary and should not be done¹³⁹.

AIII

d. Blood spills⁹

i. Appropriate personal protective equipment should be worn for cleaning up a blood spill. Gloves should be worn during the cleaning and disinfecting procedures. Care must be taken to avoid splashing or generating aerosols during the clean up. If the possibility of splashing exists, the worker should wear a face shield or safety glasses/mask and gown. For large blood spills, overalls, gowns or aprons as well as boots or protective shoe covers should be worn. Personal protective equipment should be changed if torn or soiled, and always removed before leaving the location of the spill, then hands should be washed immediately.

BIII

ii. The blood spill area must be cleaned of obvious organic material before applying a disinfectant, as hypochlorites and other disinfectants are substantially inactivated by blood and other materials^{9,140,141}. Excess blood and fluid capable of transmitting infection should be removed with disposable towels. Discard the towels in a plastic-lined waste receptacle.

AII

iii. After cleaning, areas should be disinfected with a low level chemical disinfectant (e.g., chemical germicides approved for use as 'hospital disinfectants', such as quaternary ammonium compounds) or sodium hypochlorite (household bleach). Concentrations ranging from approximately 500 ppm (1:100 dilution of household bleach) sodium hypochlorite to 5000 ppm (1:10 dilution of household bleach) are effective, depending on the amount of organic material (e.g., blood or mucous) present on the surface to be cleaned and disinfected. Please refer to Appendix V, Table B, Directions for Preparing Using of Chlorine-based Disinfectants.

Commercially-available chemical disinfectants may be more compatible with certain medical devices that might be corroded by repeated exposure to sodium hypochlorite, especially the 1:10 dilution^{62,140,142}. Manufacturers' recommendations for dilutions and temperatures of chemical disinfectants approved for use as hospital disinfectants must be followed. Sodium hypochlorite or chemical germicide should be left on surface for at least 10 minutes.

AII

iv. The treated area should then be wiped with paper towels soaked in tap water. Allow the area to dry. The towels should be discarded in a plastic lined waste receptacle.

AIII

v. Hands must be thoroughly washed after gloves are removed.

AII

2. Laundry

Special handling of linen contaminated with secretions from patients suspected of having or confirmed to have influenza is not required. The following recommendations apply in all circumstances.

Recommendations

- a. Process
- i. Parent organizations must provide a specially trained, knowledgeable person responsible for laundry. Where there is no “parent” organization to plan or operate the triage settings, it is expected that another organization would assume this role. **AIII**
- b. Collection and handling
- i. There is no special handling required for linen from patients suspected of having or confirmed to have influenza. **AII**
 - ii. All soiled linen should be handled in the same way for all patients. **AII**
 - iii. Linen should be handled with a minimum of agitation and shaking^{126,127,143}. **BIII**
 - iv. Sorting and rinsing of linen should not occur in patient care areas. **BIII**
 - v. Heavily soiled linen should be rolled or folded to contain the heaviest soil in the centre of the bundle^{126,127}. Large amounts of solid soil, feces or blood clots should be removed from linen with a gloved hand and toilet tissue then placed into a bed pan or toilet for flushing. In order to prevent splashing, excrement (e.g., from clothing, reusable incontinence pads) should not be removed by spraying with water. **BIII**
- c. Bagging and containment
- i. Soiled linen should be bagged at the site of collection^{126,127,144}. **CIII**
 - ii. To prevent contamination or soaking through, a single, leakproof bag^{126,144,145} or a single cloth bag can be used¹⁴³. A second outer bag is only required to contain a leaking inner bag^{126,127,145,146}. **BII**
 - iii. Use of water soluble bags is not recommended. These offer no benefit for infection control and add additional costs^{126,127}. **BIII**
 - iv. Laundry carts or hampers to collect or transport soiled linen do not need to be covered¹²⁷ unless odor control is a factor. **BIII**
 - v. Bags should be tied securely and not over-filled when transported either by chute or cart¹²⁶. **BIII**
 - vi. Linen bags should be washed after each use and can be washed in the same cycle as the linen contained in them¹²⁷. **BIII**

d. Transport

- i. When linen is commercially laundered, adequate separation of clean and dirty laundry in the truck is essential to ensure that there is no opportunity for mixing clean and dirty linen. **BIII**
- ii. Linen transported by cart should be moved in such a way that the risk of cross contamination is minimized^{121,127}. **BIII**
- iii. Separate carts should be used for dirty and clean linens. Carts used to transport soiled linens should be cleaned after each use with a cleaning product specified for use in the health care setting. **BIII**
- iv. Clean linen should be transported and stored in a manner that prevents its contamination and ensures its cleanliness^{121,126,127}. **BIII**

e. Washing and Drying

- i. If low temperature water (less than 71.0° C) is used for laundry cycles, chemicals suitable for low temperature washing at the appropriate concentration should be used. **BIII**
- ii. High temperature washes (more than 71.1° C) are necessary if cold water detergents are not used¹²⁷. **BIII**
- iii. To achieve a level of at least 100 ppm of residual chlorine with household bleach, 2 mL of household bleach should be added for every litre of water. See Appendix V, Table B, Directions for Preparing and Using Chlorine-based Disinfectants. **BIII**
- iv. In institutional laundry areas, the addition of a mild acidic “souring” agent neutralized the alkalinity from the fabric, water and detergent. This shift in pH, from approximately 12 to 5, may inactivate any remaining bacteria and reduce the potential for skin irritation¹²⁷. **BIII**

f. Protection of laundry workers

- i. Workers should protect themselves from potential cross infection from soiled linen by wearing appropriate protective equipment, such as gloves, gowns or aprons, when handling soiled linen. Reuseable gloves should be washed after use, allowed to hang to dry, and discarded if punctured or torn. **BIII**
- ii. Hand washing facilities should be readily available. **BII**
- iii. Personnel should wash their hands whenever gloves are changed or removed^{3,5,9}. **BII**
- iv. Staff in care areas need to be aware of sharps when placing soiled linen in bags. Workers are at risk from contaminated sharps, instruments or broken glass that may inadvertently be contained with linen in the laundry bags^{126,127}. **BIII**

- v. Laundry workers, as other health care workers, should be offered immunization against hepatitis B^{6,9}.

AII

- vi. All caregivers and laundry workers should be trained in procedures for handling soiled linen⁹.

BIII

3. Waste

Waste generated in temporary hospitals is no more hazardous than household waste. Only sharps contaminated with body fluids⁹ require special handling and treatment. Appropriate waste handling is a required component of health care and cannot be overemphasized. Special handling of waste contaminated with secretions from patients with suspected or confirmed influenza is not required. The following recommendations apply in all circumstances.

See Glossary for terms.

Recommendations

a. Process

- i. Parent organizations must provide a specially trained, knowledgeable person responsible for waste. Where there is no “parent” organization to plan or operate the triage settings, it is expected that another organization would assume this role.

AIII

- ii. Written policies and procedures to promote the safety of waste handlers should be established.

BIII

- iii. Special handling of waste contaminated with secretions from patients with suspected or confirmed influenza is not required.

AII

b. Regulations

- i. Local environmental and health regulations should be followed when planning and implementing treatment and disposal policies for biologic waste.

BIII

- ii. Specific categories of biologic waste may be disposed of in a properly managed landfill provided that there are procedures in place to protect workers and the public from contact with the waste.

BIII

- iii. Medical waste, (e.g., gloves, sponges, dressings, or surgical drapes that are soiled or soaked with blood or secretions) may be contained in impervious waste-holding bags or double bags and may be disposed of in a landfill¹⁴⁷⁻¹⁴⁹.

BIII

- iv. If local regulations permit it, blood, suctioned fluids, excretions and secretions may be disposed of in a sanitary sewer.

BIII

v. Used needles and other sharp instruments should be handled with care to avoid injuries during disposal. Used sharp items should be disposed of immediately in designated puncture-resistant containers located in the area where the items were used^{9,125}.

AIII

vi. A biohazard symbol is required on all sharp containers. Provincial or territorial regulations regarding colour coding must be followed.

BIII

vii. The transportation of infectious waste must comply with the *Transportation of Dangerous Goods Act and Regulation*, Transport Canada¹⁵⁰.

viii. Infectious waste must be stored in a designated location with access limited to authorized personnel. Refrigerated space should be provided for lockable, closed storage of laboratory waste that will be disposed of off site¹⁵¹. Provincial/territorial regulations for specific storage requirements must be followed.

BIII

ix. As the waste generator is accountable for waste disposal, ensure careful selection of waste hauling, treatment and disposal firms so all stages of transportation and disposal are carried out in a safe and legal manner¹⁵¹.

BIII

c. Waste Handlers

i. Waste handlers should wear protective apparatus appropriate to the risks involved, (e.g., protective footwear and heavy work gloves).

BIII

ii. Waste handlers, as with other HCWs, should be offered hepatitis B immunization^{6,9}.

AI

H. Care of the Deceased

Attention to routine infection prevention and control practices is sufficient for handling bodies of individuals who have died from influenza. There is no additional risk of transmission of influenza infection.

Recommendations

1. Adherence to the routine infection control practices for hand washing/hand hygiene, mask/eye protection/face shields, glove and gown use, as outlined above during the care of the deceased body, is required.

AIII

2. The body of the deceased should be placed in a body bag or wrapped in a sheet when a body bag is unavailable and, preferably, kept in a cool, dry location until pick up by funeral services.

AIII

Guideline Rating System

Health Canada Guideline Evidence-Based Rating System

Three categories rank the strength of evidence for a recommendation and three grades describe the quality of supportive studies for that recommendation. This format uses an evidence-based approach through the critical scrutiny of evidence from clinical trials research, well designed experimental and observational studies, and places less emphasis on descriptive studies, clinical intuition, and recalled experiences. The rating scale is outlined in the table below.

Table Strength and Quality of Evidence for Recommendations	
Categories for strength of each recommendation	
CATEGORY	DEFINITION
A	Good evidence to support a recommendation for or against use
B	Moderate evidence to support a recommendation for or against use
C	Insufficient evidence to support a recommendation for or against use
Categories for quality of evidence	
GRADE	DEFINITION
I	Evidence from at least one properly randomized, controlled trial
II	Evidence from at least one well-designed clinical trial without randomization; from cohort or case-controlled analytic studies, preferably from more than one centre, from multiple time series; or from dramatic results in uncontrolled experiments
III	Evidence from opinions of respected authorities on the basis of clinical experience, descriptive studies, or reports of expert committees

Note: If established regulations are quoted in a document, no ratings are assigned to these legislative requirements.

World Health Organization (WHO) Definition of Preparedness Levels

Phase 0 : Interpandemic

No indication of any new virus type has been reported.

Phase 0 : Preparedness Level 1

New influenza strain in a human case.

No clear evidence of spread or outbreak activity.

Phase 0 : Preparedness Level 2

Human infection confirmed.

Two or more human infections have occurred with a new virus sub-type, but the ability of the virus to readily spread from person-to-person and cause multiple outbreaks of disease leading to epidemics remains questionable.

Phase 0 : Preparedness Level 3

Human transmission of the new virus sub-type has been confirmed through clear evidence of person-to-person spread in the general population, such as secondary cases resulting from contact with an index case, with at least one outbreak lasting over a minimum two week period in one country.

Phase 1 : Confirmation of onset of pandemic

The pandemic will be declared when the new virus sub-type has been shown to cause several outbreaks in at least one country, and to have spread to other countries with consistent disease patterns indicating that serious morbidity and mortality is likely in at least one segment of the population.

Phase 2 : Regional and multi-regional epidemics

Outbreaks and epidemics are occurring in multiple countries, and spreading region by region across the world.

Phase 3 : End of the first pandemic wave

The increase in outbreak activity in the initially affected countries or regions has stopped or reversed, but outbreaks and epidemics of the new virus are still occurring elsewhere.

Phase 4 : Second or later waves of the pandemic

Based on past experiences, at least a second severe wave of outbreaks caused by the new virus would be expected to occur within 3-9 months of the initial epidemic in many countries.

Phase 5 : End of the pandemic (back to Interpandemic phase; Phase 0)

WHO will report when the Pandemic Period has ended, which is likely to be after 2-3 years. The indications for this will be that indices of influenza activity have returned to essentially normal inter-pandemic levels and that immunity to the new virus subtype is widespread in the general population.

Hand Hygiene Procedures

A. How to Wash Hands (using non antimicrobial soap and antimicrobial soap)

Remove jewellery before hand wash procedure ^{152,153} .
Rinse hands under warm running water. Rationale: This allows for suspension and washing away of the loosened microorganisms.
Lather with soap and, using friction, cover all surfaces of the hands and fingers. Rationale: The minimum duration for this step is 10 seconds ¹⁵⁴ ; more time may be required if hands are visibly soiled. For antimicrobial agents 3-5mL are required ¹⁵² . Frequently missed areas are thumbs, under nails, backs of fingers and hands.
Rinse under warm running water. Rationale: To wash off microorganisms and residual hand washing agent.
Dry hands thoroughly with a single-use towel. Drying achieves a further reduction in number of microorganisms ^{155,156} . Re-useable towels are avoided because of the potential for microbial contamination.
Turn off faucet without re-contaminating hands, e.g., use single use towel. Rationale: To avoid re-contaminating hands
Keep fingernails short ^{157,158} and do not use fingernail polish or artificial nails. Rationale: Chipped nail polish may increase bacterial load ¹⁵⁸ . Artificial nails including wraps, acrylics or tips increase bacterial load ¹⁵⁹⁻¹⁶¹ . Nail polish and artificial nails impede visualization of soil under nails.

Adapted from Health Canada Infection Control Guidelines: *Hand Washing, Cleaning, Disinfection and Sterilization in Health Care*, 1998³.

B. Decontaminating Hands with an Alcohol-based Hand Rub

To decontaminate hands that are not visibly soiled* using an alcohol-based hand rub:

- Follow the manufacturer's recommendations on the volume of product to use;
- Apply product to palm of one hand and rub hands together, covering all surfaces of hands and finger, until hands are dry.

Note: * Hand wash if hands are visibly dirty or contaminated with proteinaceous material or are visibly soiled with blood or other body fluids by washing with either a non-antimicrobial soap and water or an antimicrobial soap and water as outlined in Appendix III A, How to Wash Hands.

(adapted from¹)

An Influenza-like Illness (ILI) Assessment Tool

An ILI assessment tool is to be used for immediate triage of patients or staff and for accommodation/cohort of patients prior to further OH or clinical management. This is not intended to be used as a clinical management tool. A clinical management assessment tool can be found in Annex G of the Canadian Pandemic Influenza Plan.

ILI Assessment Tool

Please check the following.

ILI in the general population is determined by the presence of 1, 2 and 3 and any of 4., a – c, which could be due to influenza virus:

- ____ () 1. Acute onset of respiratory illness
- ____ () 2. Fever (> 38° C)*
- ____ () 3. Cough
- 4. One or more of the following:
 - ____ () a. sore throat
 - ____ () b. arthralgia
 - ____ () c. myalgia or prostration

* May not be present in elderly people

Adapted from the ILI surveillance definition currently used by FluWatch for the 2002-2003 season⁸.

Tables

Surface/object	Procedure	Special considerations
Horizontal surfaces such as over bed tables, work counters, baby weigh scales, beds, cribs, mattresses, bedrails, call bells	<ol style="list-style-type: none"> 1. Thorough regular cleaning 2. Cleaning when soiled 3. Cleaning between patients/clients and after discharge 	<p>Special procedures sometimes called carbolizing are not necessary.</p> <p>Some environmental surfaces may require low level disinfection (e.g., in nurseries, pediatric settings, critical care, burn units, emergency rooms, operating rooms and bone marrow transplantation facilities).</p>
Walls, blinds, curtains	Should be cleaned regularly with a detergent and as splashes/visible soil occur.	
Floors	<ol style="list-style-type: none"> 1. Thorough regular cleaning 2. Cleaning when soiled 3. Cleaning between patients/clients and after discharge. Damp mopping preferred 	<p>Detergent is adequate in most areas.</p> <p>Blood/body fluid spills should be cleaned up with disposable cloths followed by disinfection with a low level disinfectant.</p>
Carpets/upholstery	Should be vacuumed regularly and shampooed as necessary.	
Toys	Should be regularly cleaned, disinfected with a low level disinfectant, thoroughly rinsed, and dried (between patients in acute care setting).	<p>For pediatric settings, toys should be constructed of smooth, nonporous (i.e., not plush) materials to facilitate cleaning and decontamination.</p> <p>Do not use phenolics.</p>
Toilets and commodes	<ol style="list-style-type: none"> 1. Thorough regular cleaning 2. Cleaning when soiled 3. Clean between patients/clients and after discharge. Use a low level disinfectant 	These may be the source of enteric pathogens such as <i>C. difficile</i> and <i>Shigella</i> .

Table B. Directions for Preparing and Using Chlorine-based Disinfectants³

Product	Intended Use	Recommended dilution	Level of available chlorine
Household bleach (5% sodium hypochlorite solution with 50,000 ppm* available chlorine)	Cleanup of blood spills	Use concentrations ranging from 1 part bleach to be mixed with 99 parts of tap water (1:100) or one part of bleach to be mixed with 9 parts of tap water (1:10), depending on the amount of organic material (e.g., blood or mucus) present on the surface to be cleaned and disinfected.	0.05% or 500 ppm 0.5% or 5,000 ppm
	To add to laundry water	One part (one 8 ounce cup) of bleach to be mixed with about 500 parts (28 gallons†) of tap water	0.01% or 100 ppm
	Surface cleaning Soaking of glassware or plastic items	One part (one 8 ounce cup) to be mixed with about 50 parts (2.8 gallons) of tap water	0.1% or 1,000 ppm
NaDCC (Sodium dichloroisocyanurate) powder with 60% available chlorine	Cleanup of blood spills	Dissolve 8.5 g in one litre of tap water	0.85% or 5,000 ppm
Chloramine-T powder with 25% available chlorine	Cleanup of blood spills	Dissolve 20 g in one litre of tap water	2.0% or 5,000 ppm
* Parts per million			
† Imperial gallon (4.5 litres)			

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Clinical Care Guidelines and Tools

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Summary of significant changes:

- Several sections have been added with advice on clinician preparedness, real-time communication, the need for a business continuity plan and personal preparedness.
- As an appendix to the Annex - the “Pandemic Primer for Front Line Health Care Workers” has been developed to walk the front line clinician through seven key aspects of pandemic preparedness.

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Section 1: Introduction

For this Annex, “clinicians” are defined as all health care providers who provide primary care. “Health care planners” are those who work on health care system preparedness for an influenza pandemic for the Ministry of Health at the provincial/territorial level.

Clinicians are on the front line in responding to an influenza pandemic. During an influenza pandemic, however, the health response will go well beyond the bedside and will involve a complex health system that includes community-based services, hospitals, public health at all levels of government and laboratories. An effective health system response to an influenza pandemic requires real-time data on the disease and the effectiveness of interventions. This involves clinician reporting and public health professionals working at the local, provincial/territorial, national and international levels. This annex describes what clinicians need to know in the context of this broader health system response.

1.1 Purpose and Scope

The purpose of this Annex is to assist local and provincial/territorial health care planners and clinicians in preparing for and responding to a pandemic. It was developed by front-line clinicians, including family physicians and nurse practitioners; experts in infectious diseases, laboratory medicine, respiratory medicine and intensive care; and public health professionals. It is designed to increase awareness of the complementary roles of clinical care providers, the laboratories and public health in responding to a widespread infectious disease outbreak such as an influenza pandemic. With the information, advice and practical tools provided in the Annex, health care planners will be able to enhance clinical preparedness in their jurisdiction, and clinicians will increase their knowledge of the clinical aspects of a pandemic influenza response.

Section 1: Introduction provides an overview of the Annex and identifies some key ethical principles that inform a health system response to a pandemic. *Section 2: Clinical Preparedness* outlines the areas of information that provincial/territorial health care planners should provide to clinicians to prepare them for an influenza pandemic. *Section 3: Clinical Response* is directed to both health care planners and clinicians, and touches upon many of the areas covered in the Canadian Pandemic Influenza Plan for the Health Sector (CPIP) and its other annexes. This section responds to the need for clinicians to obtain clinical information on pandemic influenza in a summary format.

There are “Recommendation” boxes throughout the document. These boxes are intended to highlight key information that health care planners will want to make clinicians aware of.

1.2 Ethics of Clinical Care During Public Health Emergencies

The principles of public health ethics have guided the development of this Annex and the CPIP overall. It is important to note that the responsibilities of health care planners, who focus on the organization of health services, are different from those of clinicians, who focus on the needs of the individual patient. Hence, the implications of the ethical principles may be somewhat different for each group. These ethical principles are provided as guiding values, and it is acknowledged that they may come into tension with each other.

On the basis of the six ethical principles outlined in the CPIP, health care planners and clinicians will want to consider the need for the following:*

- **Protect and promote the public's health.** This is the organizing principle of public health action. For health care planners, it includes the duty to protect those who are on the front lines helping to fight disease. For clinicians, it implies the “duty of care”,¹ according to which all health care professionals are expected to go beyond the normal call of duty during a health emergency.
- **Ensure equity and distributive justice.** Decisions taken during an influenza pandemic must be fair, especially as they relate to allocation of limited resources during an emergency. This principle applies to policy development by health care planners and policy implementation by clinicians.
- **Respect the inherent dignity of all persons.** As noted, resources will be limited. This principle refers to the importance of how resource allocation is carried out. Although some people may not be eligible for all interventions, they need to be informed and cared for in a way that is respectful and maintains their dignity.
- **Use the least restrictive means.** Health measures needed to minimize the risk of infectious disease in a population should be reasonable and use the least restrictive means possible. This relates to measures that may restrict personal autonomy in the interest of curbing the spread of disease.
- **Optimize the risk-benefit ratio** of public health interventions to favour the common good. This includes not only an assessment of evidence of safety and efficacy but of all possible risks, such as opportunity costs and logistical challenges, as well as all possible benefits.
- **Work with transparency and accountability.** In particular, health care planners have an obligation to educate clinicians and the public in terms of decisions taken and the process used to arrive at these decisions. Clinicians have an obligation to educate their patients about the decisions taken and the process used to arrive at these decisions.

More in-depth explorations of these guiding principles are available. The “Stand on Guard for Thee” document, produced by the Joint Centre for Bioethics of the University of Toronto,¹ identified many of the ethical issues that may arise during an influenza pandemic. In terms of resource allocation, such as who is given access to limited numbers of ventilators, specific guidelines have been proposed, and work continues to inform these guidelines.²

Recommendation:

There are common ethical principles that guide decision making during an influenza pandemic, although the implications of these may be different for health care planners and clinicians. Health care planners should inform clinicians about the underlying ethical principles used in developing the CPIP and identify some of the implications for consideration in clinical practice.

* Canadian Pandemic Influenza Plan for the Health Sector, Section 2: Background, p 14-16.

Section 2: Clinical Preparedness

This section identifies areas that clinicians in Canada need to be aware of in order to be prepared for an influenza pandemic. In addition, Appendix 1, Pandemic Primer for Front-Line Health Care Professionals, is an educational tool addressing many of the areas in this Section and could be used to meet these clinical preparedness needs in the different provinces and territories.

2.1 Understanding the Risk

Although avian influenza outbreaks and human cases of H5N1 avian influenza infection are often described in the media, clinicians need a summary document that identifies the current risk and how the current situation relates to the risk of a pandemic. In addition, pandemic planning assumptions, such as the anticipated attack rate and expected burden of illness, hospitalizations and deaths, should be conveyed to ensure that clinicians have specific information about how a pandemic might affect their community. Clinicians also need a quick reference document that explains the World Health Organization (WHO)'s pandemic phases and the related Canadian pandemic phases.

Recommendation:

Health care planners should inform clinicians about the underlying assumptions used in the CPIP, including the clinical attack rates, hospitalizations and mortality rates. Clinicians will also need to understand the Canadian pandemic phases with respect to the WHO phases.

2.2 Understanding the Pathogenesis of Influenza

Clinicians have an inherent interest in the pathogenesis of disease. It is important that clinicians understand how influenza viruses are spread and how they infect the human host; the incubation period; the period of infectivity associated with these viruses; and how this leads to the symptoms of the disease, complications and death. This needs to be described in the context of seasonal influenza, of pandemic viruses of the past and of novel viruses that could cause an influenza pandemic in the future. The variation among influenza viruses needs to be identified, necessitating real-time information on the clinical features of the pandemic virus.

Recommendation:

Health care planners should provide clinicians with information about how influenza viruses are spread; how they infect the human host; the incubation period; the period of infectivity; and how this leads to the symptoms of the disease, complications and death. They should also indicate that these characteristics may differ for a novel influenza virus and that when a novel virus emerges one of the first tasks will be to assess these parameters and adjust response plans as necessary. (For an example, see Appendix 1.)

2.3 Understanding the Health System Response

Clinicians need to understand how their health care system works in response to an infectious disease outbreak. This requires an explanation of the health system response plan for their jurisdiction. The jurisdictional plan typically includes a brief explanation of the enabling legislation in the specific province or territory for both the public health and the emergency management response. The jurisdictional plan should emphasize the need to coordinate efforts locally among clinicians, public health and the public health laboratory system to facilitate the early detection, reporting and response to emerging infectious disease threats. It may also be beneficial to include a brief description of how public health is organized in Canada and its interface with the WHO, especially as the plan relates to the new International Health Regulations (IHR) to which Canada is a signatory.³ The regulations require a national capacity to detect and report to WHO any infectious disease in Canada that may have international significance. All provinces and territories have agreed to support Canada's commitment to the IHR.

Information designed specifically for clinicians on early detection and response to an emerging infectious disease will soon be available in the form of an online course for which continuing medical education credits will be available. Look for information about this course on the Public Health Agency of Canada (PHAC) Web site in winter 2008/09 (see: <http://www.phac-aspc.gc.ca>).

Recommendation:

Health care planners should provide clinicians with information about the roles and responsibilities of clinicians, public health and laboratory professionals at the local, provincial/territorial, federal and international levels in response to an influenza pandemic.

2.3.1 Surveillance and Early Detection

Since influenza-like illness can be caused by multiple agents, early detection of pandemic activity in Canada relies on clinicians being on the alert and working with local public health officials to ensure that rapid viral testing and early reporting to provincial/territorial authorities takes place. The earlier the pandemic virus is detected in Canada, during the pandemic wave, the more likely it is that public health and other measures can be implemented early enough to achieve optimal effectiveness. Front line clinicians are the “eyes” of the health care system, and they need clear guidance on what to look for and when to test.

Provisional guidelines include the federal/provincial/territorial document *Avian Influenza (H5N1) in Humans: Travel/Exposure Screening for Patients Presenting with Severe Respiratory Illness (SRI) and Severe Influenza-Like Illness (severe ILI)*, which is available for adaptation in the provincial/territorial context.⁴ As with any outbreak of emerging infectious disease, more specific information will be made available to provincial/territorial governments at the time of the outbreak.

Guidelines must stress the need for clinical information to be included on laboratory requisitions. This is to help laboratories correctly triage samples in order to evaluate the most suspicious cases first, and it will also assist in the collection of surveillance data, which will ultimately help determine the epidemiology of the pandemic and inform the response. Information that is necessary includes age, sex, symptoms, pertinent contact and travel history, and any other epidemiological information that puts the patient at risk. Some jurisdictions have developed specific requisition forms to support this process. The most up-to-date version of the CPIP annexes on surveillance and laboratory services should be reviewed as well as documentation located on the PHAC Emerging Respiratory Infections Web site⁵ in order to

establish an effective, consistent and sustainable approach to early detection and reporting of suspected cases of pandemic influenza.

Recommendation:

Health care planners should ensure that mechanisms are in place to enable real-time communications with clinicians during a pandemic as new information that may affect their practice becomes available. Clinicians need to know ahead of time how real-time communications with their local public health authority and the Ministry of Health will occur.

2.3.2 Real-Time Communications

Provincial/territorial and federal governments have made a commitment to providing transparent and timely communications regarding the threat or arrival of pandemic activity in Canada and have mechanisms in place to facilitate communication within the health care system and with the public.

In light of the fact that the management of pandemic patients may change over the course of the pandemic as new information becomes available, it is of utmost importance that there are strategies in place to establish real-time communications with clinicians during a pandemic. While every effort will be made to ensure that communications at the national, provincial/territorial and local levels are consistent, it must be acknowledged that the country will be responding to an evolving situation, and messaging may be inconsistent from time to time.

Recommendation:

Health care planners should ensure that mechanisms are in place to enable real-time communications with clinicians during a pandemic as new information that may affect their practice becomes available. Clinicians need to know ahead of time how real-time communications with their local public health authority and the Ministry of Health will occur.

2.3.3 Antiviral Medications

Clinicians may not be aware that a National Antiviral Stockpile (NAS) has been established to ensure that there are antiviral medications for the early treatment of all who are anticipated to need it during a moderately severe pandemic. The size and composition of the stockpile will be re-assessed on an ongoing basis. By April 2008, there were 53 million doses (i.e. 5.3 million treatment courses) of neuraminidase inhibitors, approximately 90% in stock being oseltamivir (Tamiflu®) and 10% zanamivir (Relenza®). Additional pediatric capsules are expected to be added in the near future. These stocks are distributed to provinces and territories on a per capita basis. In addition, some jurisdictions have augmented their stockpiles on their own.

The issue of the use of antivirals for prophylaxis is under review, but at this time no policy decision has been made by federal/provincial/territorial governments to use or enhance the existing NAS for prophylaxis purposes. (See Section 3.4: Therapeutic options, including the use of antiviral drugs.)

Recommendation:

Health care planners should provide clinicians with information about the National Antiviral Stockpile (NAS) and its intended use for **early treatment (within 48 hours of onset of symptoms)**. Clinicians need prescribing information on the two major antiviral medications, oseltamivir⁶ and zanamivir.⁶ When it has been formally approved, clinicians will need information on Canada's prophylaxis policy.

2.3.4 Emergency Health Services

Every province and territory is planning how they will organize emergency health services to meet the increased demands for health care during an influenza pandemic. Many provinces and territories are planning for assessment centres (in part to facilitate the distribution of antiviral medications), yet many clinicians are not clear on what their role will be in such centres.

Recommendation:

Health care planners should provide information to clinicians about how health services will be organized during a pandemic and what role clinicians will be expected to play.

2.3.5 Public Health Measures

At this time, individual-focused public health measures, such as individual case investigation (including contact tracing and quarantine of contacts), will only be considered for the Pandemic Alert phases (i.e. before a pandemic), when containment of a novel influenza virus may be possible and demand on resources would be manageable. During Phase 6 (when there is sustained transmission in the general population), contact tracing and quarantine will no longer be feasible or effective for several reasons: the short incubation period of the influenza virus; the fact that people can be infectious before symptoms begin; and the time and resources required for this type of intervention given the number of cases expected at that time. Clinicians need to know that community-based public health measures will be used during a pandemic, for example, advice to the public on voluntary self-isolation when ill, travel advisories and, possibly, school closures and cancellation of public gatherings.

Recommendation:

Health care planners should provide clinicians with information regarding who will make decisions on public health measures in their community during a pandemic, how these decisions will be communicated to them and how they may affect clinicians in their practice.

2.3.6 Pandemic Vaccine

The Government of Canada has a contract with a domestic manufacturer of influenza vaccine to ensure that enough pandemic vaccine is produced for all Canadians. Clinicians will need to know what their role is (if any) in the dispensing of pandemic vaccine when it does become available.

Recommendation:

Health care planners should provide clinicians with information on the national pandemic vaccine strategy; identify the local/provincial/territorial implementation plans for providing it to the entire population; and describe the role that clinicians will be expected to play.

2.4 Best Practices in Infection Prevention and Control

Clinicians are interested in improving their infection prevention and control practices, and a number of guidelines have been developed to address this in the primary care setting. Annex F (*Infection Prevention & Control and Occupational Health & Hygiene Guidelines during Pandemic*)

Influenza in Existing and Temporary Health Care Settings) of the CPIP is expected to be released in winter 2008/09.

Recommendation:

Clinicians need to be given clear infection prevention and control guidelines for the primary care and office practice setting that are consistent with the updated Annex F of the CPIP as it relates to the primary care and office practice setting.

2.5 Business Continuity Planning

Clinicians need guidance in the area of business continuity planning. The basic tasks of business continuity planning can be found on the Public Safety Canada Web site⁷ and include the following:

- conducting a business impact analysis (identify critical services, impacts of disruption and critical dependencies);
- developing a business continuity plan that would mitigate the risks identified by disruptions;
- completing response preparation and readiness procedures (such as stockpiling critical supplies and staff training);
- conducting quality assurance procedures, such as exercises, maintenance and auditing;
- for large health care organizations, determining the governance structure (i.e. who approves the business continuity plan).

Unique aspects for clinicians preparing for a pandemic, such as infection prevention and control, supplies and procedures, need to be considered. In addition, creating alternative options for patients with less urgent medical needs, for example, instituting telephone-based prescription renewals, should be considered in clinicians' business continuity plans.⁸⁻¹¹

Recommendation:

Health care planners should provide clinicians with information about business continuity strategies, including infection control guidelines and human resource policies and procedures.

2.6 Personal and Family Preparedness

Clinicians' sense of preparedness will likely directly relate to their sense that their family is also prepared and is as safe as possible. Clearly, there are conflicting moral imperatives that all front-line responders will face as they reconcile their family and work duties. However, this dynamic of balancing work and home life is continually at play, and although the tensions are higher during a pandemic the ability to address both is still possible and feasible.

To optimize preparedness, clinicians will need to have family preparedness plans. This largely relates to developing agreements with family and friends regarding mutual aid and having a basic stockpile of necessary items to get through a period of illness at home. Preparedness usually involves the development of a contingency plan for the care of family members (e.g. young children, aging parents) if a clinician becomes unwell or is required to be at work for extended periods of time.

Look for a personal and family preparedness planning guide on the Public Health Agency of Canada Web site to be available in the fall of 2008 (see: www.phac-aspc.gc.ca).

Recommendation:

Health care planners should provide clinicians with information and guidance about self and family preparedness in a health emergency.

2.7 Instituting Best Practices with Seasonal Influenza

Clinicians can actively prepare for a pandemic now by instituting best practices in influenza control during seasonal influenza. Influenza occurs every year, and applying knowledge regarding infection prevention and control, along with the detection and management of influenza, will be beneficial when the pandemic occurs.

Best practices have been established for dealing with febrile respiratory illness in the ambulatory setting. These include basic infection prevention and control procedures, routine screening, promotion of influenza vaccine and consideration of the use of antiviral medications, especially in seasons when the match between circulating influenza viruses and the vaccine virus strains is less than optimal.^{12,13}

2.7.1 Screening

Clinicians should be encouraged to screen for cough and fever all patients who present in their offices for any reason. This should ideally be done by the first person who is expected to have contact with the patient (for example, a receptionist). If cough and fever are present, the patient should be instructed to clean his or her hands with 60%-90% alcohol-based hand gel sanitizer or soap and water, don a surgical mask and be seated at least 1 metre away from others. If maintaining this distance is not possible in the waiting room setting, he/she should be placed immediately in an examining room. (For additional details, see Annex F.)

2.7.2 Vaccines and Antivirals

Influenza is a vaccine preventable disease that causes approximately 4,000 deaths a year in Canada. Clinicians should be encouraged to receive the influenza vaccine themselves every year and promote vaccine uptake among their peers and patients. Anyone from 6 months of age could benefit from the influenza vaccine. Those considered at highest risk of a poor outcome of influenza are identified in the annual influenza statement by the National Advisory Committee on Immunization (NACI) (available through the Public Health Agency of Canada Web site: www.phac-aspc.gc.ca).

Clinicians should consider antivirals for early treatment (within 48 hours after symptoms begin) or post-exposure prophylaxis of **seasonal** influenza, especially in seasons when there is not a good match between vaccine and circulating influenza strains. Amantadine was used previously in controlling long-term care outbreaks but is no longer recommended because of high levels of resistance in the H3N2 virus. Oseltamivir (Tamiflu®) is now the most commonly prescribed antiviral medication, although levels of resistance are starting to be seen with the H1N1 virus. Zanamivir (Relenza®) is another antiviral medication in the form of an inhaler. More information on all these drugs is available from the product monographs. Currently, physicians seldom prescribe these medications, since few patients present early enough and the diagnosis is often uncertain.

Recommendation:

Health care planners should provide clinicians with information to encourage the adoption of routine best practices for seasonal influenza, including the implementation of screening for febrile respiratory illness, infection control, promotion of influenza vaccine and appropriate use of antiviral medications.

Section 3: Clinical Response

During an influenza pandemic there will be a large number of people seeking assessment for influenza-like illness. Assessment guidelines have been developed to evaluate the needs of each individual and to assist in the efficient triage of influenza patients in a crisis (see Appendix 1).

3.1 Self-Assessment and Initial Triage

Public education may help people to do their own personal assessment and thus reduce unnecessary strain on the health care system. Many provinces and territories are planning to set up telephone lines to conduct initial telephone assessments. These assessments will serve to determine whether a patient is unlikely to have influenza and can stay at home, whether he/she is at low risk and fits the criteria for antiviral treatment, or whether she/he needs to be seen by a clinician for further assessment. Algorithms for this purpose will need to be developed, and personnel will need to learn to use them.

Even with these mechanisms in place, there will be people who will need to be clinically assessed. Most provinces and territories plan to have centralized influenza assessment centres for the assessment and treatment of influenza patients. Triage personnel in these centres will also need to be educated regarding how to use jurisdiction-specific algorithms to decide when patients can be sent home with instruction and follow-up, managed in an ambulatory site or admitted to an acute care hospital.

The overall clinical approach to patients with influenza-like illness can be captured in the algorithm noted in Appendix 1.

Until an influenza pandemic hits and data are gathered to characterize it, we do not know how it will present or who will be “hit” the hardest. For now, it is advisable to use seasonal influenza as the benchmark, with the clear understanding that this will need to be updated at the time of a pandemic when epidemiological information on the pandemic virus becomes available.

Clinical Presentation:

When influenza is circulating in the community, the presence of fever and cough of acute onset is a good predictor of influenza. The positive predictive value increases when fever is higher than 38°C and when the onset of the clinical illness is acute. Other symptoms, such as sore throat, rhinorrhea, malaise, rigors or chills, myalgia and headache, although non-specific, may also be present.

This clinical definition is a general guide and is not intended to capture every clinical presentation. In the elderly, fever may not be present, and in children gastrointestinal symptoms may predominate. Other atypical presentations may also occur.

3.2 Assessment of Patients with Influenza-Like Illness

Primary and secondary assessment protocols for patients presenting to a clinician with influenza-like illness offer a systematic approach to triage of large numbers of patients. The primary assessment includes history taking, physical examination and an oxygen saturation measurement, if available. For detailed assessment guidelines, refer to Appendix 1.

3.2.1 Primary Assessment

Identification of risk factors for influenza complications during the history taking is an important part of the primary assessment. The risk factors identified by NACI as being associated with an increased risk of morbidity and mortality from seasonal influenza include age (less than 2 or over 65 years), pregnancy and chronic conditions such as diabetes, and cardiovascular and respiratory diseases.¹⁴ This list of risk factors is provisional for the pandemic context and may need to be revised as information about the novel influenza virus becomes available.

The primary assessment includes a check of basic vital signs and physical examination with a focus on mental status, the cardiorespiratory system and functional status. The primary assessment should also include monitoring of oxygen saturation (e.g. pulse oximetry, arterial blood gases)¹⁵ whenever possible both at presentation and routinely during subsequent care (see Table A2: Features of the primary assessment with abnormal values for adults and children, in Appendix 1). If abnormalities are found (clinical parameters outside the normal range) either with or without the presence of risk factors, then a secondary assessment is indicated.

3.2.2 Secondary Assessment

The secondary assessment, if required, involves complementary laboratory studies to further the assessment and evaluation of patients. Not all the tests identified for the secondary assessment will be needed for all patients. Clinical assessment should determine which procedures are to be done, particularly when resources are scarce. Generally, blood tests and chest radiography should be performed for all patients who need a secondary assessment (see Table A3: Investigations for the secondary assessment and abnormal values for adults and children, in Appendix 1).

If no abnormalities are found, the patient can be considered for discharge home with antiviral medications and instructions for self-care. If mild abnormalities are detected and risk factors are present, clinical judgement regarding management is indicated. In some cases, abnormalities may be stabilized with a few hours of care, after which time the patient could be sent home with care instructions, provided that appropriate home support has been assessed and arranged if required. The patient should be reassessed after 24 to 48 hours. For example, in the case of fever with dehydration, the first dose of antiviral medication and rehydration would be started, and if the patient responds to a few hours of intravenous therapy he or she could return home for the remainder of the antiviral treatment. In other situations, different management options, such as admission to an alternative care site (See Annex J: *Guidelines for Non-Traditional Sites and Workers*) or hospital may be needed.

Clinical discretion is always advised.

3.3 Indications for Laboratory Testing During a Pandemic

Laboratory testing for the pandemic virus will likely be most intense just prior to pandemic activity being detected in the community. Once the presence of pandemic influenza has been established, laboratory testing in the ambulatory care setting will largely cease in order to conserve laboratory resources for surveillance purposes, and monitoring of antiviral resistance and effectiveness. This is partially based on the assumption that when such a virus is circulating in the community it will “crowd out” other viruses and predominate. However, this will need to be assessed at the time through surveillance methods. We know that during seasonal influenza, many respiratory viruses can co-circulate in a community.

Under specific circumstances, laboratory testing will still be indicated to inform clinical care, but it may be restricted. In the hospital setting, virology testing may need prior approval by an authority such as the Director of Laboratory Medicine (or designate). Testing in the community setting will likely be even more limited and may require the approval of the local Medical Officer of Health (or designate). Hospitals and communities should develop policies governing laboratory utilization based on the current guidance provided in Annex C: *Pandemic Influenza Laboratory Guidelines*.

Provisional indications for laboratory testing to inform clinical care during a pandemic include the following:

- confirmation of an atypical presentation of pandemic influenza when it will affect a treatment decision;
- confirmation of the etiology of an institutional outbreak;
- non-response to treatment in the hospital setting (for early detection of a resistant strain in a hospital); and
- admission to the intensive care unit, to enable cohorting of patients.

Laboratory testing for surveillance purposes will continue. Local information may be available through the local/regional public health office, provincial/territorial information will be available through the Ministry of Health, and national information will be supplied by PHAC.

3.4 Therapeutic Options, Including the Use of Antiviral Drugs

All patients who meet the criteria for antivirals should begin treatment as soon as possible.¹⁶ At this time, that would include any patient who presents with cough and fever of less than 48 hours' duration, *when the pandemic virus is known to be circulating in the community*, or who tests positive for influenza. If the patient has few or no risk factors for influenza complications and all the clinical parameters, including oxygen saturation, are within the normal range, the patient can generally be sent home with antiviral medication and instructions for self-care, provided that appropriate home support has been assessed and arranged if required. Ideally, patients should be reassessed after 48 hours (possibly by telephone).

For treatment, oseltamivir is approved for persons 1 year of age and older. The recommended adult oral dosage for oseltamivir is 75 mg twice daily for 5 days. The dosage is reduced to 75 mg daily in persons with a creatinine clearance of 10-30 mL/min. For persons undergoing renal dialysis, the following recommendations apply:

- low flux hemodialysis: oseltamivir 30 mg orally every second hemodialysis session
- continuous ambulatory peritoneal dialysis: oseltamivir 30 mg orally once per week.¹⁷

Pediatric doses are provided in Section 3.7.1.

Zanamivir is recommended for the treatment of influenza in adults and children 7 years of age and older.⁶ The recommended dose of zanamivir is 10 mg inhaled twice daily for 5 days.

Treatment with either medication should begin within 48 hours of the onset of influenza symptoms.

Product monographs should be consulted for more information on the indications and clinical use of oseltamivir⁶ and zanamivir.⁶

3.5 Complications of influenza

Table 1¹⁸ identifies the complications of influenza infections. At times these complications, such as an exacerbation of chronic airways disease, may be the presenting symptom. Respiratory complications are the most common ones (especially secondary infections). Cardiac events following influenza are not uncommon.¹⁹

Complications of influenza	Major clinical category
Respiratory	Pneumonia: primary viral, secondary bacterial, combined Upper respiratory: otitis media, sinusitis, conjunctivitis Acute laryngotracheo-bronchitis (croup) Bronchiolitis Complication of pre-existing disease
Cardiovascular	Pericarditis Myocarditis Complication of pre-existing disease
Muscular	Rhabdomyositis Rhabdomyolysis with myoglobinuria and renal failure
Neurological	Encephalitis Reye's syndrome Guillain-Barré syndrome Transverse myelitis
Systemic	Toxic shock syndrome Sudden death

It is often difficult to differentiate influenza from a secondary bacterial pneumonia. Typically, with secondary bacterial infection there is a history of improvement and then worsening. On x-ray, viral pneumonias often have diffuse infiltrates; bacterial pneumonias have consolidation. It may take blood and sputum cultures to ensure that a bacterial pneumonia has not been missed.

3.6 Treating Secondary Infections

Secondary bacterial pneumonias can cause major morbidity and mortality during a pandemic; indeed, it has been estimated that up to one-third of deaths during the 1918 pandemic were due to pneumococcal pneumonia.²⁰ The most common organisms in secondary bacterial pneumonias are *Streptococcus pneumoniae*, *Staphylococcus aureus* and *Haemophilus influenzae*.

Health planners need to consider stockpiling medications and supplies to address treatment. This includes both antibiotics and supplies for sputum and blood cultures, as well as Gram stains. Stockpiling of antibiotics should be based on the most recent consensus guidelines for the management of community-acquired pneumonia in adults (see Table 2, which summarizes recent consensus recommendations).

Table 2 Recommended empirical antibiotics for community-acquired pneumonia²¹
Patients well enough for outpatient treatment
<ol style="list-style-type: none"> 1. Previously healthy and no use of antimicrobials within the previous 3 months: A macrolide (strong recommendation; level I evidence) OR Doxycycline (weak recommendation; level III evidence) 2. Presence of comorbidities such as chronic heart, lung, liver or renal disease; diabetes mellitus; alcoholism; malignancies; asplenia; immunosuppressing conditions or use of immunosuppressing drugs; or use of antimicrobials within the previous 3 months (in which case an alternative from a different class should be selected): <ul style="list-style-type: none"> ▪ A respiratory fluoroquinolone, such as moxifloxacin, gemifloxacin or levofloxacin 750 mg (strong recommendation; level I evidence) OR ▪ A β-lactam plus a macrolide (strong recommendation; level I evidence) 3. In regions with a high rate (> 25%) of infection with high-level (MIC \geq 16 μg/mL) macrolide-resistant <i>Streptococcus pneumoniae</i>, consider use of alternative agents listed above in (2) for patients without comorbidities (moderate recommendation; level III evidence)
Inpatients, non-ICU treatment
<ul style="list-style-type: none"> ▪ A respiratory fluoroquinolone (strong recommendation; level I evidence) OR ▪ A β-lactam plus a macrolide (strong recommendation; level I evidence)
Inpatients, ICU treatment
<ul style="list-style-type: none"> ▪ A β-lactam (cefotaxime, ceftriaxone or ampicillin-sulbactam)
Plus
<ul style="list-style-type: none"> ▪ either azithromycin (level II evidence) or a respiratory fluoroquinolone (strong recommendation; level I evidence). (For penicillin-allergic patients, a respiratory fluoroquinolone and aztreonam are recommended.)
Special concerns
If <i>Pseudomonas</i> is a consideration
<ul style="list-style-type: none"> ▪ An antipneumococcal, antipseudomonal β-lactam (piperacillin-tazobactam, cefepime, imipenem or meropenem) plus either ciprofloxacin or levofloxacin (750 mg) OR ▪ The above β-lactam plus an aminoglycoside and azithromycin OR ▪ The above β-lactam plus an aminoglycoside and an antipneumococcal fluoroquinolone (for penicillin-allergic patients, substitute aztreonam for above β-lactam) (moderate recommendation; level III evidence)
If CA-MRSA is a consideration, add vancomycin or linezolid (moderate recommendation; level III evidence)
MIC, minimum inhibitory concentration; ICU, intensive care unit; CA-MRSA, community-acquired methicillin-resistant <i>Staphylococcus aureus</i>

3.7 Special Populations

3.7.1 Children

Influenza virus infections represent the most important cause of acute respiratory illness requiring medical attention beyond infancy. In an eight-year study, it was shown that half of school children under 17 years of age were infected each year with influenza virus. In preschool children the infection rate was about 30% each year.²²

Uncomplicated influenza in children may be similar to that experienced by adults, but there are a number of clinical differences. Young children usually have higher temperatures (often over 39.5°C) and may have febrile seizures. In young infants (less than 2 months old) the condition can progress to severe illness rapidly. Unexplained fever may be the only manifestation of the disease in neonates and infants. Gastrointestinal manifestations, such as nausea, vomiting, diarrhea and abdominal pain, are found in 40%-50% of patients, with an inverse relation to age (mainly 3 years or younger). Otitis media and non-purulent conjunctivitis are more frequent in younger children. A variety of central nervous system findings, including apnea and seizures, may appear in as many as 20% of infants. Children may also present with symptoms suggestive of meningitis or encephalitis, e.g. headache, vomiting, irritability and photophobia.

In infants and young children (2 months to 5 years of age) danger signs include chest indrawing, nasal flaring, tachypnea, grunting or stridor, cyanosis, inability to drink, continuous vomiting, lethargy, seizures or a full or sunken fontanelle.

All children under the age of 7 years with complications or risk conditions should be assessed by a health care worker.²³

In children over 5 years of age, including adolescents, the most frequent symptoms are fever, cough, non-localizing throbbing headache, chills, myalgia and sneezing. The temperature range is usually 38-40°C, and a second peak of fever, without bacterial super-infection, may occur around the fourth day of illness. Backache, sore throat, conjunctival burning with watery eyes and epistaxis may be present, but gastrointestinal symptoms are infrequent. Chest auscultation is usually normal, but occasionally coarse breath sounds and crackles may be heard.

For treatment, oseltamivir is approved for those aged 1 year and older; dosage varies by weight as follows:

- 15 kg or less 30 mg twice a day
- > 15-23 kg 45 mg twice a day
- > 23-40 kg 60 mg twice a day
- > 40 kg 75 mg twice a day (the adult dose)

Zanamivir is approved for children aged 7 and older, and the dosage is the same as in adults: 2 inhalations twice daily.

Product monographs should be consulted for more information on the indications and clinical use of oseltamivir⁶ and zanamivir⁶.

3.7.2 Pregnant Women

NACI recommends that all pregnant women with chronic conditions (such as cardiopulmonary conditions, diabetes, cancer or anemia) and healthy pregnant woman in their second or third trimester receive the influenza vaccine.¹⁴ Reports from the pandemics of 1918-19 and 1957-58 show that excess deaths were documented in pregnant women. Pneumonia was reported in 50% of cases involving pregnant women and was associated with a 50% mortality rate and a high rate of pregnancy loss.^{24,25} Furthermore, recent data have indicated that healthy pregnant women have higher rates of influenza-associated respiratory hospitalization and medical visits than their non-pregnant peers,²⁶ and that pregnant women are at increased risk of influenza infection and complications.^{25,27}

Retrospective studies have found that no serious risk of adverse events or congenital anomalies has been reported in infants of women who received influenza vaccine during their pregnancy.²⁸ In these studies a cohort of healthy pregnant women who received influenza vaccine were compared in rate of hospital admissions and physician office visits with a control group of unvaccinated women who were matched by age, month of delivery, gestational week and medical insurance. The results showed that there was no difference between the groups in the outcome of pregnancy, risk of common disease, hospitalization rates among mothers, or infants' medical condition from birth to six months.

Not only is there little risk to the fetus from maternal influenza vaccination but also prospective studies have demonstrated protective effects. The evidence includes higher cord antibody level to influenza in babies born to mothers immunized during pregnancy, and a delay in the onset and a decrease in the severity of influenza infection in babies born with higher antibody levels.²⁹ Increased influenza vaccine use during pregnancy has the potential to benefit both the woman and her infant through maternal transplacental antibodies and breast milk-acquired immunity.^{26,28}

3.7.3 The Elderly

Excess hospitalization and death, and functional decline occur in elderly individuals after epidemics of influenza. Community-dwelling adults 65 years of age or older, and particularly frail elderly persons in long-term care institutions, are at increased risk of influenza complications.³⁰

Although influenza viral pneumonia and bacterial pneumonia following influenza are considered the main causes of influenza-related hospitalization in the elderly, many such hospitalizations are attributed to the exacerbation of chronic obstructive pulmonary disease or congestive heart failure following the viral infection. The symptoms and signs seen in older adults are similar to those in younger individuals, but most cases are characterized by the presence of dyspnea, wheezing, sputum production and fever. In some, especially the older and frailer, there may be no or minimal febrile response, and they may simply develop confusion or loss of functional capability. Thus, any unexplained acute deterioration in health status associated with or without fever may be a manifestation of influenza infection in elderly individuals. Influenza-like illness in older adults can also be caused by other viruses, such as respiratory syncytial virus (RSV), human metapneumovirus or parainfluenza virus. RSV infections are an important cause of hospitalization and death in elderly individuals. It is impossible to distinguish between RSV and influenza on the basis of clinical manifestations alone.

3.7.4 Immunocompromised Patients

People with immune system impairment resulting from chronic illness or medications are more likely to show influenza complications and are more likely to shed influenza virus for longer periods than those who are not immunocompromised.³⁰⁻³³

Persons infected with HIV: Influenza in AIDS patients is prolonged and more frequently associated with complications.³²⁻³⁴ In a cohort of young and middle-aged HIV infected women, the risk of cardiopulmonary hospitalization was higher during influenza seasons than during the peri-influenza periods. This risk was even higher than among women with other high-risk conditions, like chronic heart and lung diseases.

Influenza-associated excess mortality was found for the adult and adolescent US population with AIDS during three influenza seasons. Among persons aged 25-54 years, the risk of influenza-related death was estimated at 9.4-14.6/10,000 persons with AIDS, compared with 0.09-0.10/10,000 in the general population and 6.4-7.0/10,000 among persons older than 65 years.³³ In this study, deaths of AIDS patients due to pneumonia and influenza followed a seasonal pattern (and also a virus isolation pattern) with peaks in December-January, as in the general adult population. More than 90% of AIDS deaths occurred in the 25-54 years age group. The excess death rate in this age group was 81-155 times higher among AIDS patients than in the general US population in this age range, as compared with the summer. These death rates are comparable and even higher than those seen in the general population aged 65 years or older. Other studies have reported that AIDS patients experience more severe respiratory symptoms and prolonged duration of illness, with an increased risk of complications.^{32,34,35}

No prospective studies of influenza in immunosuppressed children or in children with AIDS have been published. It is known, however, that children with HIV commonly have severe and persistent viral respiratory infections, including influenza. A large proportion of respiratory viral infections in children with cancer or HIV are hospital acquired, illustrating the importance of protective measures.³⁶ Children with cancer who were receiving immunosuppressive therapy had similar clinical manifestations to those of control populations, but the duration of the disease was longer.^{37,38,39}

Other chronic illnesses, diabetes, neoplastic diseases, renal diseases: In any patient suffering from a chronic disease that compromises the immune system and/or metabolic homeostasis, complications of influenza may develop. These include neoplastic diseases, renal dysfunction, hemoglobinopathies, some congenital diseases and illnesses due to autoimmunity.

In the event of a pandemic, at least in the early phases, a vaccine against the pandemic virus will not likely be available, and even when it does become available some severely immunosuppressed patients, either by virtue of their disease itself or their drug therapy, are less likely to have a protective immune response to the vaccine.

3.8 Medical Directives and Other Legal Issues

The use of clinical algorithms and medical directives are recommended as strategies to decrease the strain on clinicians during a pandemic. A medical directive typically indicates a specific treatment to be given in a specific set of clinical circumstances, with clear contraindications, documentation and informed consent. It must be clear who has authorized the directive and is taking legal responsibility for it, and who is authorized to carry out the directive.

The use of medical directives is governed by provincial and territorial legislation and professional practice, and therefore planners and clinicians should be guided by their provincial or territorial legislation when considering and/or using them

Manufacturers are responsible for monitoring their marketed health products and for continuous assessment of the benefits and risks. Additionally, Health Canada has a voluntary reporting program, MedEffect, to monitor adverse drug reactions. Clinicians are advised to report any adverse drug reactions to Health Canada for both approved or “off-label” use. (See http://www.hc-sc.gc.ca/dhp-mps/medeff/index_e.html for more information.)

3.9 Education of Patients and Families

Clinicians have a lot of influence in “setting the tone” of a pandemic response, as they are dealing with people at the front line all the time. If clinicians remain positive and impart confidence that the pandemic plans will work at the local, provincial and national levels, this will go a long way to reassuring patients and stemming public fears.

Clinicians can also give the message that each person has a role to play in being part of a successful pandemic response. They need to be aware of and distribute resources and tools, such as a personal and family preparedness tool kit, so that people can be prepared to deal effectively with an influenza pandemic in the home and community settings (www.phac-aspc.gc.ca). Clinicians should advise their patients as to what changes, expectations and practices will be in place in their office during a pandemic.

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Pandemic Primer for Front-Line Health Care Professionals

“All you wanted to know about how to prepare for a pandemic, but never had time to ask”

The dedicated and well-informed health care practitioner is at the heart of the response to pandemic influenza. This is because the key challenge during a pandemic is to provide care to the many people who fall ill. Yet, many health care practitioners in Canada feel unprepared.*

This appendix is designed to assist you, the clinician, to deal with influenza pandemic situations by guiding you through the seven key aspects of pandemic influenza preparedness:

- *One organizing principle* of infection control practices for any influenza infection.
- *Two interim clinical guidelines* for the assessment and management of influenza patients.
- *Three main resources* that will help you stay abreast of new developments in pandemic preparedness at local, provincial/territorial and national levels.
- *Four major assumptions* regarding a pandemic scenario in Canada.
- *Five best practices for health care practitioners* during a pandemic.
- *Six key national strategies* we have in place for the health system in Canada to address pandemic influenza.
- *Seven steps* to ensure that you have best practices in place for seasonal influenza.

1. The One Principle of Infection Control Practices for Any Influenza Infection

The influenza virus is transmitted primarily by droplets

In order to feel confident in caring for influenza patients during a pandemic, clinicians need to know how to protect themselves and protect others. As you know, be it seasonal influenza or pandemic, all influenza viruses are transmitted in the same way. The organizing principle that underlies all infection control practices is this: **transmission of influenza virus happens primarily by droplets.**

Respiratory viruses are spread by either droplet or airborne transmission. The main difference between the two types of transmission is this: droplets drop and airborne particles float. Droplets

* Canadian Public Health Association, unpublished survey (available upon request).

are larger and generally easier to control than the smaller airborne particles. Most cold viruses are spread by droplets.

Here is what we know about the droplet transmission of influenza virus:

- Droplets generally travel about 1 metre before they drop.
- Virus can survive on hard surfaces for up to 48 hours; on hands for 5-10 minutes.
- People can be inoculated with the influenza virus either
 - **By direct contact** (i.e. someone coughs and virus-filled droplets land on someone else's eye, nose or mouth)
 - **From hands** (or anything else) that have touched a surface contaminated by virus-filled droplets or has a droplet from a cough land on them, which then comes into contact with someone's eyes, nose or throat.
- Thorough hand washing with soap and water for 20 seconds is an effective way to decontaminate hands; 60%-90% of alcohol-based hand rub applied thoroughly on the hands until it dries is equally effective and is now the preferred method of hand hygiene in the health care setting.*

The principle states that transmission occurs “primarily” by droplets. This reflects the fact that in certain circumstances droplets can turn into aerosol particles, typically during aerosolizing procedures, such as intubation. A lot of basic scientific research is being done right now to try to quantify how much influenza virus gets aerosolized and under what circumstances. Even the 1 metre estimate for droplet spread is under review. The current lack of data in this area is what is driving the debate about the use of surgical masks (which protect against virus-filled droplets) and N95 masks (which protect against airborne particles). The current recommendations in Canada and by the WHO¹ are for **thorough hand hygiene, surgical masks and eye protection to be used as routine protective measures, and during aerosolizing procedures, such as endotracheal intubation or bronchoscopy, an N95 (or equivalent) respirator, eye protection, a gown and gloves.**

2. The Two Interim Clinical Care Guidelines

The organization of health care services during an influenza pandemic will vary across Canada, depending on the provincial/territorial or even regional health system that is in place. It is estimated that less than 1% of people who are clinically ill (that is, ill enough to miss at least half a day of work) will need to be hospitalized. Thus, the basic challenge will be to set up an assessment process that determines who is well enough to return home and who needs to be hospitalized. The two interim clinical care guidelines reflect the best knowledge that is currently available and are based on clinical experience with seasonal influenza. They will be updated during the influenza pandemic as information about the virus is received.

The first assessment is a history, physical examination and an oxygen saturation test to determine whether the person can return home or needs further evaluation. The second assessment identifies the investigations that may need to be done to fully determine who can go home and who needs to be admitted to hospital.

Primary assessment

The primary assessment includes the history, physical examination and oxygen saturation measurement. During history taking, the types of symptoms and their date of onset will be

* These are no efficacy data for hand sanitizers with other agents or tubs with < 60 % alcohol.

important, as well as possible factors that may lead to complications. Table A1 identifies who is at increased risk of complications from seasonal influenza.

Table A1. Primary assessment: identifying groups at increased risk of complications from seasonal influenza	
1.	Age ≤ 2 or ≥ 65 years of age
2.	Pregnancy (second or third trimester)
3.	Cardiovascular disease: congenital, rheumatic, ischemic heart disease, heart failure
4.	Bronchopulmonary disease: asthma, chronic bronchitis, bronchiectasis, emphysema, cystic fibrosis
5.	Diabetes
6.	Renal diseases
7.	Malignancies
8.	Immunodeficiency: AIDS, immunosuppression, transplant recipients
9.	Hematologic disorders: anemia, hemoglobinopathies
10.	Hepatic diseases, cirrhosis
11.	Long-term acetylsalicylic acid therapy in those < 18 years of age; Kawasaki disease, rheumatoid arthritis, acute rheumatic fever, etc.

Table A2 identifies the key areas to cover in the physical examination of influenza patients.

Table A2 Features of the primary assessment with abnormal values for adults and children		
Clinical Feature	Adults ≥ 18 Years or Older	Children < 18 years
Oral temperature	< 35°C or > 38°C	< 35°C or > 38°C
Heart rate	New arrhythmia or pulse > 100 beats/min	Heart rate outside normal range Newborn-3 mos: 85-205 3 mos-2 yrs: 60-140 2 yr - 18 yrs: 60-100
Blood pressure	< 100 systolic or dizziness when standing	< 70 systolic + 2x age in years
Respiratory rate	> 24/min	< 2 mos: ≥ 60/min 2 mos-12 yrs ≥ 50/min >12 mos-5 yrs ≥ 40/min >5 yrs-18 yrs ≥ 30/min
Skin colour (lips, hands)	Cyanosis	Cyanosis or sudden pallor, or cold legs up to the knee
Chest pain/chest signs	Chest pain or any abnormality on auscultation	Chest pain, indrawing or any abnormality on exam
Mental status	New onset of confusion	Lethargy, decreased consciousness or confusion
Function	Vomiting > 2/day or new onset of loss of functional capacity	Vomiting > 2/day, loss of appetite, dehydration or inability to breastfeed
Neurological signs/symptoms	Seizure or reduced level of consciousness	Stiff neck, photophobia, convulsion, full fontanelle
Oxygen saturation	< 90% room air	< 90% room air

Systematic recording of each patient encounter is required; standardized checklists will likely make this easier.

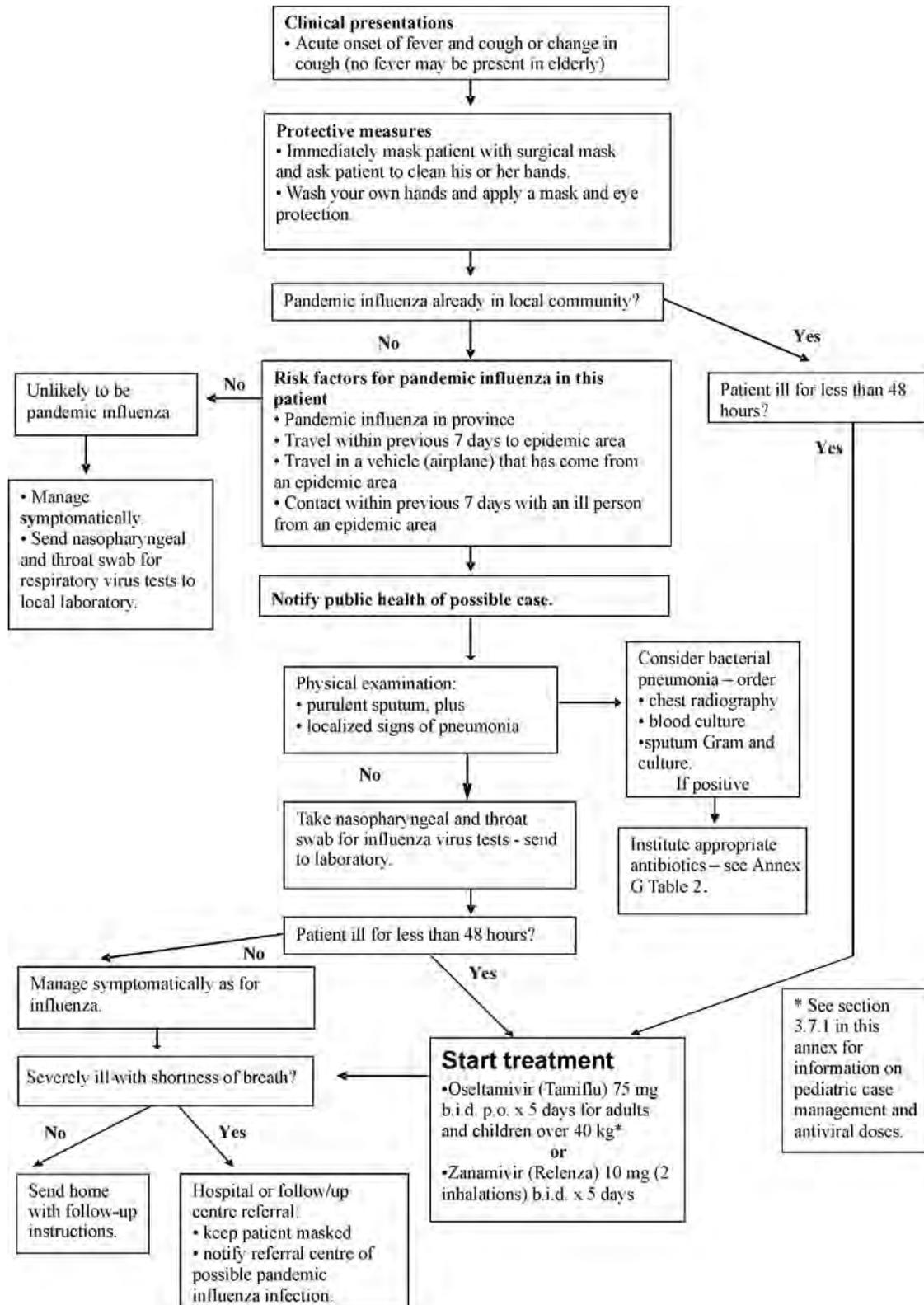
Secondary assessment

Abnormal clinical features and indicators, and significant co-morbidity would generally be the indicators to conduct a secondary assessment. These are identified in Table A3. Note that viral diagnostic testing will be important at the onset of the influenza pandemic in any given community to document its arrival. After this, however, diagnosis will be presumptive, based on the history and the clinical presentation. Viral testing will not be readily available during the height of the pandemic because of the need to maintain essential laboratory services. Once the pandemic is established in a community, it is likely that viral tests will be restricted to specific indications (e.g. to rule out the emergence of a resistant strain). It will be important to look for laboratory guidelines at the time for indications of when to test.

	Adults ≥ 18 Years or Older	Children < 18 years
Oxygen saturation	< 90% room air	< 90% room air
Chest radiography	Abnormal, consistent with pneumonia or heart failure	Abnormal, consistent with pneumonia or heart failure
Hemoglobin	Hb ≤ 8.0 g/dL	Newborn: < 14.5 or > 22.5 Toddlers: < 9.0 or > 14 6-12 yrs: < 11.5 or > 15.5 12-18 male: < 13 or > 16 12-18 female: < 12 or > 16
White blood cell count	< 2,000 or > 12,000	Newborn: < 9,000 or > 34,000 Infant: < 5,000 or > 19,500 Toddler: < 6,000 or > 17,500 4-7 yrs: < 5,500 or > 15,500 8-13 yrs: < 4,500 or > 13,500 13 to < 18yrs: < 4,500 or > 11,000
Sodium	Na ≤ 125 or ≥ 145 mmol/L	Infants: < 139 or > 146 Child: < 138 or > 145 Teen: < 136 or > 146
Potassium	K ≤ 3 or ≥ 5.5 mmol/L	< 2 mos: < 3.0 or > 7.0 2-12 mos: < 3.5 or > 6.0 > 12 mos: < 3.5 or > 5.0
Blood urea nitrogen	BUN ≥ 10.7 mmol/L	< 13 yrs: < 1.8 or > 6.4 Teen: < 2.5 or > 6.4
Creatinine	≥ 150 µmol/L	Infant: < 18 or > 35 Child: < 27 or > 62 Teen: < 44 or > 88
Glucose	≤ 3 or ≥ 13.9 mmol/L	Child: < 3 or > 5.5
Viral diagnostics	According to laboratory guidelines	According to laboratory guidelines
Electrocardiogram	Evidence of ischemia or new arrhythmia	Evidence of ischemia or new arrhythmia

To give an overall sense of how the assessments of patients would proceed, a clinical algorithm has been developed.

Algorithm for Clinical Management of Pandemic Influenza



3. The Three Main Resources to Keep You Abreast of New Pandemic Developments

You now have the essential infection control and clinical guidance you need for the assessment of patients with influenza or influenza-like illness. However, you also know that research is currently under way to better understand influenza transmission and that the clinical guidelines may change as we know more. So the next logical question is: What is the best way to stay informed of new developments? Here are your three most reliable sources:

Resource #1 – Your health care institution

Hospital-based nurses and physicians will receive information through the senior staff at the hospital. They, in turn, are linked with their local health unit as well as their provincial or territorial Ministry of Health.

Resource #2 – Regional and provincial public health authorities

Every health care practitioner in Canada should know how to contact his or her local Medical Officer of Health. Why? There are two very good reasons:

1. Ultimately, a pandemic happens at the local level. Each jurisdiction should have its own pandemic plan, and the local Medical Officer of Health has been identified as the person who will help facilitate planning in his/her local area. Plans for how health care services will be organized should either be “under construction” by now or posted on the local public health Web site.
2. The first person in Canada who has a novel or pandemic virus will likely be seen by a front-line health care practitioner. This heralds the start of a complex national health emergency. What if that person is you? If you suspect that a person may have a severe respiratory illness (for example, has cough, fever and a history of travel to an area where the pandemic virus is circulating), the first thing you are going to want to do is discuss this with your local Medical Officer of Health. He or she can help you get the nasopharyngeal kit for virology testing and ensure that it gets to the nearest public health laboratory, and will arrange for public health nurses to do contact tracing (identifying all those who may have been in close contact with this patient).

Provincial and territorial Ministries of Health have the primary responsibility for health care in their jurisdiction. Although efforts have and will be made to promote a consistent response across the country, the primary focus for decisions affecting health care during a pandemic will be made at the provincial/territorial level. Each province and territory is working out how they will have ongoing real-time communication with health care practitioners during a pandemic, and some are working with the medical licensing bodies to assist with this. To be prepared, you may want to know your provincial/territorial Ministry of Health Web site, fax or telephone number. (The best way to contact the provincial or territorial Ministry of Health varies across the country.)

Resource # 3 – The Public Health Agency of Canada

Many things have happened in the wake of SARS (severe acute respiratory syndrome) in Canada, and one has been the establishment of the PHAC. The Agency is the Canadian equivalent of the US Centers for Disease Control and Prevention (CDC), and like the CDC it has a Branch dedicated to infectious diseases and emergency preparedness. This Branch provides support to the national Pandemic Influenza Committee, which is responsible for maintaining and updating the Canadian Pandemic Influenza Plan for the Health Sector. The Agency also provides support to the Public

Health Network Council, which brings together the Chief Public Health Officer and the Assistant Deputy Ministers of Health from all the provinces and territories. The Agency is also the focal point for reporting any emerging infectious disease activity to the WHO.

The PHAC Web site contains extensive information about pandemic influenza (which can be accessed at www.influenza.gc.ca). Another area of relevance to health care practitioners is the section on emerging respiratory infections. This section on the PHAC Web site (www.phac-aspc.gc.ca) contains clinically relevant information on what to do if you have a possible case of serious respiratory infection of unknown origin, H5N1 or an emerging pandemic influenza virus.

4 The Four Major Assumptions Regarding a Pandemic Scenario in Canada

Now that you have a picture of the clinical approach to pandemic influenza, it is important to take a moment to appreciate the larger picture, in order to place these guidelines into context. Just what exactly will we be up against? No one is certain what the next pandemic will look like or even when it will occur, but modellers have reviewed the pandemics of the past and come up with their best guesses as to what might be a best, moderate or worst case scenario. In national planning exercises, Canada has adopted the moderate case scenario, with the understanding that the actual pandemic could be either milder or more severe. These assumptions give us an idea of what we might be facing.

Assumption #1 – We are currently at increased risk of a pandemic

The WHO has concluded that we are at increased risk of an influenza pandemic because of numerous sporadic human cases of H5N1 associated with H5N1 outbreaks in birds. It is possible that another avian influenza virus will be the source of the next pandemic; however, at this point, we do not know how or when the next pandemic will occur.

Assumption #2 – Over 70% of the population may become infected during a pandemic, but only 15%-35% of the population will become clinically ill (i.e. there will be a high rate of asymptomatic infection)

These numbers are based on previous experience with influenza pandemics. Note that people who become infected but are asymptomatic would be expected to develop immunity to the virus. The impact of the pandemic in terms of severity, age distribution and extent of spread will not be known until the pandemic virus has begun spreading efficiently in the human population.

Assumption #3 – Of those who are clinically ill, about 50% will seek outpatient care, 1% will be ill enough to require hospitalization, and 0.4% will die

These estimates are based on a moderate pandemic scenario in which the impact of antivirals and vaccine has not been included. A mild pandemic would be similar to the one of 1968. A severe pandemic would be similar to the one of 1918 and could have up to a 2% mortality rate without intervention. Therefore, during an unmitigated moderate influenza pandemic a family physician with a practice of 2,000 patients could expect about 700 patients to become clinically ill (over the course of one to two waves, each lasting 6-8 weeks), 350 would seek health care and 2-3 patients may die. The use of antivirals and pandemic vaccine (when available) are expected to decrease these numbers.

Assumption #4 – It is expected that the pandemic influenza virus will circulate in any given community for 6-8 weeks, and will likely come back for a second wave

Influenza generally follows the typical bell curve, in which cases are few at first, become much more frequent, peak and then subside. It can then return weeks or months later.

5. The Five Best Practices for Health Care Professionals to Consider When Preparing for Pandemic Influenza

Best Practice #1 – Psychological preparedness

It is important that front-line health care professionals feel prepared for a pandemic and cultivate the resiliency needed to get through what will inevitably be a trying time. Studies of Vietnam War veterans have found that the chance of experiencing post-traumatic stress disorder after the war was not related to the level of stress or trauma experienced. The most important predictor was a feeling of helplessness during the experience. Those who felt some level of control, including self-control, were much more likely to recover completely from their experience.

First-hand accounts from health care workers after Hurricane Katrina spoke of the importance of having small comfort items (such as different shoes to change into every 8 hours) to help give both a sense of control and relief during long hours of work.²

Best Practice #2 – Family preparedness

Nothing helps people withstand emergencies better than well-laid plans that result in families feeling that they can “weather the storm”. Now is the time to review and reinforce basic hand hygiene and cough etiquette practices with your family. Take the time to discuss with your spouse, parents, children and others close to you how you might be able to deal with a widespread infectious disease outbreak. What often works is setting up mutual aid agreements. If your spouse falls ill, you may want to take a couple of days to be with him/her and take care of your family. Once he/she is on the road to recovery, perhaps a friend or neighbour could help. If schools close, some people have tentatively planned home schooling arrangements for their children and a few of their friends.

Best Practice #3 – Practice-based preparedness

The basic overall strategy to be prepared in your practice will be something like this: ensure that infection control procedures are in place, know how you will be updated during a pandemic, predetermine how you will triage your patient load to lighten routine care, and discuss with colleagues how you will cover for each other. Infection control and real-time communications during a pandemic have already been discussed, so we will focus on the other two aspects of the strategy.

The basic exercise in triage is to work out which patients may not need routine care during a pandemic. For office-based practices this may mean that routine blood pressure or blood sugar checks can be postponed and renewal of prescriptions can be done by telephone. Elective surgeries will likely be postponed or cancelled.

As with the discussions you will have with family and friends, it is wise to form a small group of colleagues and co-workers, and develop a plan of mutual aid and cross-coverage to get through a 6-8 week period of intense demand for health care services at a time when you or your colleagues may fall ill.

Best Practice #4 – Ethics-based decision making

There are a number of ethical considerations that come into play during a pandemic; here are a few key principles:

First, there is the **duty of care**. All health care professionals will be asked to work hard during a pandemic. It is understandable that among the first reactions clinicians may experience is some personal trepidation when hearing the news that the pandemic has hit Canada. It is hoped that, nonetheless, you will respond to the call of duty. Of course, it will be much easier to respond to this call of duty if the previous best practices have already been put in place.

Second, there is the **duty to protect**. The people responsible for organizing health care services know that there is a moral and legal duty to protect those who are on the front lines helping to fight this disease. In turn, those who are on the front lines need to protect the patients whom they are looking after, especially the vulnerable.

Third, studies of Canadian values explored in the context of pandemic planning have identified the **importance of being practical, fair and equitable**. The public realizes that it won't be "business as usual" during a pandemic, and there will be a scarcity of resources. Work has already begun on rationing the use of respirators in intensive care units according to principles such as, "those who are most likely to recover will have priority". Doctors will be expected to do their best in making these difficult choices during a pandemic and will need to work hard to ensure that the choices they make are fair, humane and for the larger good.

Best Practice #5 – Patient preparedness

Most people today are aware that there is a threat of a pandemic and may ask you for advice. Use the patient educational guide to promote the idea of preparedness and resiliency. Emphasize that there will be organized health care services and treatments available, but people will also have to be self-reliant as much as they can. **Promote the idea of a "flu buddy"** or an arrangement of mutual aid, and identify the importance of volunteerism for those who remain well. Point them to reliable information sources, such as the provincial Ministry of Health Web site, its telehealth services or telephone number for general inquiries, and the PHAC.

6. The Six Key National Strategies

Now that you have a good sense of the clinical challenges that a pandemic poses, and how you can deal with them, we will end with the good news: Canada has one of the best national pandemic plans in the world. A lot has been done at the federal, provincial and territorial levels to support the clinical care response. However, as a health care practitioner you have a critical role to play when interacting with the larger health system to ensure that there is a well coordinated and seamless response.

National strategy #1 – Surveillance and early detection

Early detection of a pandemic in Canada relies on early reporting of suspicious cases to public health and positive laboratory identification. The first step is routine influenza surveillance or our current national FluWatch program, and our Severe Respiratory Illness (SRI) Reporting protocol. FluWatch contains several data sources, including influenza-like illness reporting from sentinel health care practitioners across Canada, laboratory testing to identify influenza and other respiratory viruses, subtyping of influenza samples and assessment of antiviral resistance, as well as provincial/territorial assessments of their "flu activity levels. Should the risk of a pandemic increase, alerts and SRI reporting would be actively encouraged. During a pandemic, a surveillance strategy

will track the entry, extent and exit of the pandemic virus in communities across Canada. Once the first pandemic wave is over, surveillance would return to routine FluWatch activities with evaluation activity geared to fine-tuning the overall strategy for a second wave.

The laboratory strategy is currently being worked out. Once the pandemic has been declared, it will be critical that health care practitioners do not overwhelm their local laboratory with samples. Laboratories have finite staff and resources, and are currently working out how best to limit the number of laboratory tests that are done during a pandemic while maintaining both clinical and a population-based monitoring capacity.

National strategy #2 – Transparent and timely communications

Provincial/territorial and federal governments are committed to transparent and timely communications regarding the threat or arrival of a pandemic, and are planning mechanisms to facilitate communication with the broader health care system and the public. There will also be regular media briefings when timely updates on pandemic activity and response will be given at local/regional, provincial and federal levels.

National strategy #3 – Emergency health services

The organization of health services during a pandemic will differ according to province and territory, and may differ among regions. A recent national survey identified that most provinces currently have plans for hospitals, long-term care facilities and for telephone-based advice. Some provinces have decided to organize special assessment centres to assess those with 'flu-like symptoms; others are in the process of doing so. Checklists are available in the Canadian Pandemic Influenza Plan regarding the setting up of alternative care sites and dealing with mass fatalities. Your local public health unit will communicate with doctors to inform you of the plans and how you and your patients can fit into them.

National strategy #4 – Antiviral medications

As of April 2008, Canada has a stockpile of 53 million doses of antiviral medications consisting of approximately 90% oseltamivir (Tamiflu) and 10% zanamivir (Relenza). These medications have been distributed to provinces and territories on a per capita basis. The National Antiviral Stockpile's size, composition and uses are being reviewed on an ongoing basis. Currently, the stockpile is reserved for an early treatment strategy. The question of whether the national stockpile should be increased for purposes of prophylaxis is under review. There are an additional 12 million doses of antiviral medications in a national emergency stockpile for surge capacity.

National strategy #5 – Public health measures

Classic public health measures, such as isolation of cases and quarantine of contacts, may be used prior to a pandemic, before efficient human-to-human transmission is established and when containment may still be possible. Once the pandemic is under way these measures will no longer be effective because of the short incubation period of the influenza virus, its propensity for community spread and the presence of asymptomatic infection. During a pandemic, community-based public health measures will be used, such as public advice on voluntary self-isolation when ill, travel advisories and, if necessary, school closures and cancellation of public gatherings.

National strategy #6 – Pandemic vaccine

Ultimately, the best strategy against a pandemic virus is a vaccine. Canada is fortunate to have a domestic manufacturer of influenza vaccine, with a contract to produce enough pandemic vaccine for all Canadians. However, it will take about six months after a pandemic has been announced before vaccine will be available. Clinical trials to enhance manufacturer and regulatory preparedness are currently being planned in Canada, and these may shorten this lag time. Thus, it is anticipated that antivirals will be the main treatment modality for the first wave, and vaccine will be available to prevent the second or subsequent waves of a pandemic.

7. The Seven Steps to Prepare Now for Seasonal Influenza

Seasonal influenza hits Canada every year, and this creates an opportunity to practise our pandemic readiness. Please review these seven steps for optimal management of seasonal influenza.

1. Optimize your management of patients with fever and cough
 - Screen your patients for cough and fever by 'phone for emergency appointments and upon arrival. If patients do have these symptoms ask them to don a mask and to clean their hands with alcohol-based hand gel, and direct them to a separate area (at least 1 metre away from other patients or directly into an examining room).
 - Have provisions of masks, tissues and alcohol-based hand gel readily available.
 - Consider the use of antivirals when influenza is suspected and the patient either has not had the 'flu vaccine or it is a season of relative mismatch between the circulating viruses and the vaccine.³
 - Arrange for surfaces to be disinfected after patient visits.
2. Ensure that you and your personnel receive the influenza vaccine every year.
3. Immunize your patients with seasonal 'flu vaccine and pneumococcal vaccine, especially those at risk.
4. Consider requesting viral sampling kits from your local health unit.
5. Given the opportunity, support your local FluWatch program and visit the PHAC FluWatch Web site to learn about influenza activity in your region.
6. Inform your patients before the season about the following topics:
 - What the 'flu symptoms are.
 - How the 'flu is transmitted.
 - How it can be prevented.
 - That antibiotics won't help.
7. Inform your patients about self-care:
 - Risk factors and complications.

Conclusion

Today, we are better prepared for a pandemic than ever before, with surveillance systems and sophisticated laboratory capacity for early identification, antiviral drugs stockpiled and vaccine manufacturing plants at the ready. Nonetheless, challenges remain. Links between clinical care, public health and laboratories need to be strengthened. Health care plans for pandemic influenza need to be made ready for operation, and clinicians need to ensure that they have the information and supplies they need to feel protected and prepared.

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Resource Management Guidelines For Health Care Facilities During an Influenza Pandemic

Date of Latest Version: February 2004

Note:

- This annex may not contain up-to-date information on the antiviral strategy. Refer to the Preparedness section of the Plan and Annex E for this information.
- See Background section of the Plan for information on the latest pandemic phase terminology.
- This annex may be out-of-date with respect to other planning activities and policy decisions.
- This annex is expected to be updated in 2007.

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Introduction

During influenza epidemics and pandemics when the overall attack rate is relatively high, even a low frequency of complications will result in marked increases in rates of hospitalizations. Pandemic influenza usually occurs in waves lasting 6 to 8 weeks in any one location. Therefore the demand on health care services provided at health care facilities can be expected to increase, peak and decline during the weeks in which any one location is affected.

It is estimated that between 34 thousand and 138 thousand people will need to be hospitalised in Canada during the next pandemic if the attack rate is between 15% and 35%. This will put enormous stresses on all aspects of the medical system and medical resources will be stretched beyond capacity.

This document is divided into a background section and two main guidelines sections - guidelines regarding the management of resources in health care facilities, and guidelines on the need for and identification of additional human resources as part of pandemic planning activities involving health care facilities. These guidelines identify activities for the interpandemic, pandemic and post-pandemic periods.

Although these guidelines focus on resource management in health care facilities, health services are delivered in many other settings, including: triage centres; telephone health support; physician clinics; ambulance/paramedical services; patient transport services; home care; long term care facilities, and public health. In addition, “non-traditional” health care sites may be set up for the pandemic response (e.g., mobile health units, acute /subhealth care facilities). Regional and local planners will need to address resource management issues for all health services settings. Guidelines for resource management in non-traditional sites are considered in another annex of the *Canadian Influenza Pandemic Plan – Annex J - Guidelines for Non-Traditional Sites and Workers*.

1.0 Background

1.1 Planning Assumptions

Current disaster plans primarily address multi-casualty, short-term, localised emergency situations. In a pandemic the impact is virtually world-wide and the duration of the “emergency” will be longer. Since multiple jurisdictions will be affected simultaneously, the sharing and exchange of resources may not be possible between jurisdictions.

For the purposes of resource planning for pandemic influenza the following assumptions have been made.

a) It is unlikely that there will be a “Declaration of Emergency”.

Regional Pandemic Plans should not assume that a National or Provincial Emergency will be “declared”, as this is unlikely to occur in the event of a pandemic.

b) The health care system may be overwhelmed.

There will be an increase in physician visits, hospitalizations and deaths putting the health care system under extreme stress.

- Canadian institutions are presently running at or close to maximal bed capacity and budget cutbacks and staff shortages have meant that many jurisdictions have already reduced elective admissions.
- Increasing or even maintaining existing bed capacity requires committed human resources. During a pandemic, shortages of personnel, supplies and equipment can be expected to limit the ability of institutions to respond to a significant increase in patient volume.

c) The best use of resources will be achieved through system-wide prioritization.

A pandemic will require a regional prioritization of needs and resources, across the health care system, not just a review of resources at a single institution. For example, in terms of human resources, health care professionals may need to be moved from vaccination clinics to hospitals or from one hospital to another. Beds, ventilators and other equipment may need to be moved to non-traditional sites. This will require a review of logistical, ethical and practical issues throughout the region.

d) There will be limited transfer of resources.

The global nature of the crisis will mean that resources from other jurisdictions cannot be depended upon for meeting additional requirements during a pandemic.

e) The usual supply lines will be disrupted.

The demand for medications, medical/surgical and other supplies will increase substantially around the world and across the country. Suppliers may experience difficulties responding to increased demand, due to staff shortages, raw material shortages and transportation disruptions. Additionally, because most medications, equipment and supplies are produced outside of Canada, there will be barriers to obtaining supplies which include embargoes of medications, cross border issues and transportation issues due to staff shortages.

f) A pandemic vaccine may be unavailable.

There will likely be no vaccine available until well into the first wave of a pandemic or later, depending on the time necessary to find a suitable vaccine seed strain, and for development, testing and production. When a vaccine does become available, immunization clinics targeting health care workers may need to be established inside health care facilities.

g) Anti-influenza drugs will be in short supply.

Currently no raw materials for anti-influenza drugs are produced in Canada. Existing supplies are very limited and insufficient to form the basis for an effective antiviral response strategy. Stockpiling of these medications is being considered.

When and if antiviral drugs are made available, treatment and prophylaxis for people seeking health care services at health care facilities will need to be prioritised according to national recommendations.

h) The number of essential service workers will be reduced.

The availability of health care workers, and service providers essential to limiting societal disruption during a pandemic, may be reduced due to illness in themselves or family members.

i) The pandemic will occur in waves.

The pandemic will likely occur in successive waves of approximately 6 to 8 weeks duration in any one community followed by a recovery period of unknown duration. Between the waves substantial resources will be required to “catch up” with elective procedures, delayed treatments for cancer or cardiac care and other treatments. Maintenance on equipment, restocking of supplies, and other activities necessary to recover and prepare for another pandemic wave will need to occur during this time frame.

1.2 Projecting the Impact

No one can predict how serious the impact of the next influenza pandemic may be. Current Canadian estimates have been calculated based on attack rates for symptomatic illness of 15% and 35%, however, higher attack rates are possible. Local estimates of the potential impact of a pandemic (the number of ill persons, the number of hospitalisations, number of deaths, etc.) can be projected using software programs, e.g., the “FluAid” software developed by the Centers for Disease Control and Prevention in the U.S. (<http://www2.cfd.gov/bd/fluaiHlt13977776d Hlt13977776/default.htm>).

This software presents some challenges and has some limitations based on the fact that it is geared to the U.S. health care system and health seeking behaviours, which may be quite different from Canada. Currently there are no reliable tools for estimating rates of intubation, which would assist in planning for equipment such as ventilators. An example of how one province, Alberta, has used FluAid is provided as Annex A in the Preparedness Section of the Plan.

2.0 Resource Management in Health Care Facilities

2.1 Resource Management During the Interpandemic Period

The following activities should take place during the interpandemic period. Further detail is provided below this list.

- Review emergency preparedness legislation
- Identify triggers for intervention
- Planning for increased bed capacity
- Plan for patient prioritisation
- Plan for critical equipment and supplies

2.1.1 Review Emergency Preparedness Legislation

Emergency Preparedness Legislation makes many provisions for the management of a crisis, obtaining and accessing materials, and other resources, implementation of crisis plans and also provides for a crisis management structure. This includes the recruitment of professional and other paid staff as well as volunteers, managing human resources and protection of people who volunteer. Pandemic planning should be integrated with the emergency legislation as well as emergency plans of the jurisdictions in order to make best use of existing plans and resources.

Important Note: Regional Pandemic Plans should not assume that a National or Provincial Emergency will be “Declared”, as it is highly unlikely to occur in a pandemic. Provincial and territorial planners should assess issues such as workers compensation and liability insurance, maintaining and supporting workers and other aspects of the plan that may arise without such a declaration.

The national support framework is not contingent upon a declaration of a national emergency. It is recommended that all provincial and territorial planners review both the Federal and the Provincial/Territorial Emergency legislation to determine how to integrate plans within the framework of emergency legislation.

For example it is important to identify what provisions of legislation are particularly applicable to obtaining use of property and materials in a crisis. These provisions would include but likely not be limited to:

- the ability and responsibility of authorities to requisition property for use as non-traditional sites,
- access to transportation, materials, administrative staff and other resources, and
- compensation for requisitioned property.

2.1.2 Identify Triggers for Implementation

Existing legislation and emergency plans at the government and institutional level already identify criteria that would trigger the implementation of specific plans. The *Canadian Pandemic Influenza Plan* will also describe general points of action.

In co-ordination with existing legislation and plans, provincial/territorial, regional and local authorities and institutions should identify key criteria and methodologies that would trigger the phased implementation of plans regarding resource management activities in their jurisdiction. The local medical officer of health, together with the local pandemic response team, will decide when to initiate the pandemic influenza plan for their jurisdiction.

Since it is unlikely that the pandemic will start in Canada, the first trigger may be reports of the severity and epidemiology of the pandemic from other countries. This will likely be the first indicator of what to expect when the pandemic reaches Canada in terms of demand for health care services.

Local health care resources and local disease epidemiology, for example, the number of confirmed influenza cases in the community, or data on the impact of pandemic influenza on other Canadian jurisdictions, will determine the triggers for health services emergency plans. These triggers may include:

- The proportion of emergency room visits attributable to influenza.
- The proportion of influenza cases requiring hospitalisation.
- The capacity of the hospital to accommodate influenza cases.

Other triggers may include reports from sentinel physician or walk-in clinics that they cannot accommodate all of the patients requesting appointments for influenza-like-illness. Ambulance re-routing to other acute care setting due to full emergency rooms may serve as another trigger for reallocation or acquisition of resources. The trigger points and surveillance protocols should be defined during the interpandemic period.

Federal, provincial/territorial, regional and local authorities and institutions may designate points at which the following specific actions are taken.

- Changing staffing ratios, job duties
- Reducing surgical slates, admissions
- Consolidating services
- Procuring additional supplies
- Calling on alternative staff
- Re-routing of ambulances

2.1.3 Planning for Increased Bed Capacity

In any institution a “bed” includes infrastructure support, including staffing, which is required to care for the patient in that “bed”. Therefore the requirements for a “bed” in an intensive care unit, for example, include all the support required for a patient to be cared for at that level.

Planning to increase bed capacity during a crisis includes:

- identifying the strategies in advance,
- planning for the consequences of these strategies, and
- identifying trigger points at which the options will be implemented.

Various options to increase bed capacity have been identified, including:

- reducing elective admissions and surgeries to maximise medical bed capacity, and to maximise critical care beds,
- changing protocols or requirements for early discharge,
- increase home care staffing,
- increase the number of residential beds, long-term care and hospice beds,
- re-opening capacity currently closed,
- using reserved critical care capacity,
- using emergency ventilation facilities in recovery and operating rooms,
- assessing associated sites such as clinics, extended care facilities and psychiatric facilities for use by non-influenza patients, and
- creating “flex” beds during the influenza season.

Programs that track and manage Bed Capacity such as the Ontario Critical Program and Ontario Resource Registry, British Columbia’s “Bedline” and Alberta’s Call Centre System play a key role in the transfer/placement of critical care patients across the province, thus ensuring that staffed beds are used to maximum advantage. The Resource Management subgroup has recommended that each province/territory create a centralized bed registry, call centre and centralized ambulance dispatch.

Appendix A of this document includes checklists to assist in evaluating bed capacity in health care facilities.

2.1.4 Plan for Patient Prioritization

During a pandemic it will be a challenge to manage high ward and intensive care unit censuses, and high emergency department volumes in the face of reduced availability of health care workers and limited respiratory support equipment.

The pandemic may have a first wave of approximately 6 to 8 weeks and there may be one or more subsequent waves. Cancellation of elective admissions and surgeries, as a way of managing limited resources, could have serious consequences for some patients, including cancer and cardiac patients. Since elective surgeries are not all equivalent in terms of necessity and risks of delay, health authorities must consider within their province/territory, region, municipality and/or facility how patients scheduled for elective admissions/surgeries will be prioritized if beds are limited.

Prioritization of health resources at times of critical shortages will also need to be considered. Local community-based centres and hospitals need to take a multi-disciplinary approach and include ethical and legal considerations when developing any prioritization processes. The Clinical Care Guidelines (Annex G in the *Canadian Influenza Pandemic Plan*) provide recommendations on the assessment and management of influenza and non-influenza patients during a pandemic, including algorithms on the triage of adults and children based on their clinical presentation and

risk factors or co-morbidities. However, if supplies, equipment, and access to intensive care must be rationed, a fair and equitable prioritization process will need to be established.

A general approach to ethical considerations will be developed by the national pandemic planning working groups. This will require further discussions including ethics and public consultations. With the ethical considerations and goal of the pandemic response in mind, each community will need to make their own decisions on prioritization, depending on the availability of resources, stage of the pandemic in the community and management decisions made up until the point that rationing/prioritization becomes necessary. Since there are so many variables and contingencies, it is highly unlikely that a nationally developed guideline would be detailed enough to meet the needs of those involved in these types of decisions at the local level.

2.1.5 Plan for Critical Equipment and Supplies

A pandemic will likely result in shortages of medications, medical supplies, and potentially, operational supplies. Since multiple jurisdictions including other countries will potentially be affected by these shortages, the response plan should not rely heavily on outside assistance in terms of the provision of supplies and equipment. Some of the issues directly affecting Canadian supplies will be:

- **Interrupted transportation lines** — Canadian supplies travel long distances by truck train and aircraft. Supplies are often obtained from the U.S. and other nations. Difficulties at border crossings may substantially affect supply lines. In addition, a loss of up to 30% of workers, drivers, and other transportation staff may affect the production and delivery of supplies.
- **Lack of inventory**—In an effort to reduce costs, most health regions have moved to “just-in-time” inventory systems that keep minimal supplies on hand.
- **Embargoes** — The majority of medical supplies are not produced in Canada. Health Canada has made major efforts to establish a domestic infrastructure for the manufacturing of influenza vaccine and has encouraged in-Canada manufacture of some antibiotics. However in many cases supplies are provided by only one or two manufacturers worldwide, or the essential ingredients or components come from a single source. In past pandemics and health crises other nations have banned the export of critical vaccines, medications and supplies.

Recommendations for the use of vaccine and antivirals during a limited supply situation are provided in other annexes. Other resources such as the Infectious Diseases Society of America (IDSA) Guidelines lists medications considered to be critical in the treatment of influenza and pneumonia. These guidelines should be distributed to and reviewed by health care facilities during the interpandemic period since these issues will affect the management patients and resources, including medications, within the facility.

Stockpiling

Provinces/Territories and local health authorities may wish to review the possibility of rotating stockpiles of critical supplies for health care facilities within their own jurisdictions. Jurisdictions may specifically wish to keep some older equipment such as beds, which need little maintenance and have no specific “shelf life”. Appropriate assessment should be made of the maintenance and training required to ensure the safety and effectiveness of older equipment, training needed by staff to use unfamiliar equipment, etc. (See Appendix B for supply management checklist)

After such a critical assessment, institutions and health authorities may consider maintaining certain critical pieces of older equipment such as ventilators.

The stockpiling of antiviral drugs will be discussed at the national level, however, the need to and feasibility of stockpiling critical medications for the management of patients with influenza and secondary pneumonia, should be addressed at the P/T and local levels. In addition, provinces and territories will have to discuss with local pandemic planners the need to stock larger quantities of medications and equipment to manage persons with co-morbidities, e.g., chronic cardiac and respiratory disease, diabetes, renal failure, that may be exacerbated by influenza infection. The Clinical Care Guidelines (Annex G) provide guidance on antibiotics for the treatment of secondary pneumonia. The antibiotics currently stockpiled at the national level will be reviewed to determine whether these can be utilized in a pandemic, in addition to, further discussions on the need for additional national stockpiles.

Local Production

During a crisis some items, which are usually ordered from centralized sources, may be produced locally. Procurement specialists may wish to review which supplies could be obtained or produced locally if prior arrangements are made. Possible suppliers and suppliers of alternative products should be contacted to explore this possibility.

2.2 Resource Management During the Pandemic Period

Prior to the onset of the pandemic it not known which populations will be most affected by the novel virus, and what the prominent symptoms of the disease, and the most common complications will be. Once the WHO has identified a “Novel Virus” and confirmed “Human to Human Transmission”, this information will gradually become available. Planners should review the epidemiology of the disease in light of the demographics of their own population and in terms of their existing resources and revise plans for the allocation of resources based on this information.

The following activities, with respect to health care facilities, should occur during this phase of the pandemic when the triggers indicate the need for action.

- Implementation of emergency plans.
- Increase bed capacity.
- Review critical equipment and supplies.

2.2.1 Implementation of Emergency Plans

Based on the previously identified triggers for action and existing legislation and plans, the phased implementation of pandemic response plans will be initiated at this time.

2.2.2 Increase Bed Capacity

To increase bed capacity, based on the plans made during the interpandemic period, the following activities may occur during the pandemic:

- re-open closed wards and hospitals,
- cancel elective surgeries and admissions based on the prioritization process determined earlier,
- centralize the tracking of bed capacity,
- use of reserved critical care capacity,
- preparation and use of emergency ventilation facilities in recovery and operating rooms,
- cohorting infectious and non-infectious patients in alternative sites such as clinics or extended care facilities, and
- discharge as many patients as possible based on revised criteria for discharge.

Provinces and territories should review and consider any existing legislation that may put restrictions on patient and staff movement.

2.2.3 Review Critical Equipment and Supplies

Review and revise supply needs and plans based on WHO and Health Canada epidemiologic projections.

- Order additional supplies.
- Establish alternate transportation/distribution arrangements if required.
- Establish domestic production of supplies where possible.

Health Canada or other authorities will notify jurisdictions of the status of stockpiles, embargoes, and emergency production facilities. Vaccine and antiviral supplies and recommendations on their use in times of shortages will be co-ordinated at the national level.

2.3 Resource Management During the Post-Pandemic Period

Activities at health care facilities during this pandemic phase will focus on the implementation of recovery plans to return the facility to its normal, interpandemic, operating state. Beds may be closed and additional supplies acquired during the pandemic may be returned or put into storage. The pandemic response should be reviewed and evaluated so that plans may be revised as necessary during this or the interpandemic period.

3.0 Guidelines for Human Resource Management in Acute Care Settings

3.1 Introduction

During an influenza pandemic there will be an increased need for people with health care training to deal with the increased demands on the health care system. This may involve the re-locating of health care workers to different settings within an acute care facility or expansion of the services usually provided at these facilities (e.g., to include immunization clinics for health care workers). In addition, non-health care workers or retired health care workers may need to be hired/contracted to provide supplementary services essential to meet the demand for services at health care facilities. Volunteers will also be a potentially vital source of human resources to facilitate the management of health care services during a pandemic.

During an influenza pandemic the shortage of trained medical staff will be one of many barriers to the provision of adequate care. A significant proportion of the workforce may be unable to attend work for a period of time due to illness in themselves or family members. Communities and health care organizations will need to have specific guidelines in place to address what will be done if the health care system is overwhelmed and non-traditional sites must be established or current service sites expanded. Human resource management at non-traditional sites during a pandemic is addressed in the Guidelines for Non-Traditional Sites and Workers, Annex J of the Plan. This section of the document will therefore focus on human resource issues in acute care settings.

3.2 Human Resource Management During the Interpandemic Period

Health authorities may make preliminary estimates of staffing needs based on estimates of the impact of a pandemic and the demographics of the region (see Section 2.1).

The following list of activities is provided to assist with planning for the optimal use of human resources, including health care workers, trainees, retirees and volunteers, at health care facilities. Further details are provided in the following sections.

- Plan for optimal use of health care workers and volunteers
- Review emergency legislation pertaining to health care workers and volunteers
- Provide training
- Consider insurance and licensing issues
- Immunization of health care workers, including volunteers
- Plan for support for health care workers, including volunteers

3.2.1 Plan for Optimal Use of Health Care Workers

The work involved in identifying current health care workers who could be re-located within an institution and recruiting additional health care professionals, other health care workers and volunteers that could offset some of the increased demands on health care workers that will occur during a pandemic, should be initiated during the interpandemic period.

a) Appoint a human resource management team

Identifying current health care workers; recruiting additional professionals, non-professionals and volunteers; and managing the training, assignment and support of health care workers to various locations and tasks will be some of the most important pandemic preparedness tasks. Establishment of a team or subcommittee that could take on these responsibilities in each jurisdiction is an important first step. A combination of professionals with expertise in human resource issues, pandemic planning, health care administration, infection control, occupational health and safety, and volunteer organizations would be desirable for this planning team/subcommittee.

b) Placement of personnel

During a pandemic, health care workers may need to be reallocated from their usual roles and settings. For example, trained health care professionals, may be required to expand their role to include the supervision of volunteers and other staff in the acute care settings, affiliated clinics and non-traditional sites.

While it is likely that all health care workers will be needed at their usual acute care facility, consideration should be given as to the source of staff for other sites including:

- Triage Sites – community triage sites: at clinics, non-traditional sites, attached to an existing hospital.
- Non-Traditional Sites – including emergency care centres, emergency hospitals, support hotels, nursing stations, etc.
- Vaccination Clinics –clinics in acute care sites, etc.

The Guidelines for Non-Traditional Sites and Workers (Annex J) address many of the human resource issues involving these sites. However, it is important to recognize that the expertise needed for the clinical management of influenza patients predominantly resides within the health care facilities. Positioning some staff at these sites may offset the demands on the health care facilities and ultimately lead to the optimal use of human resources.

Health authorities must review the needs of their own communities to determine whether more emphasis should be placed on supporting community care options and which staff will be needed where.

c) Review scopes of practice

Even in acute care settings, delegation of tasks and authority will, by necessity, change during a pandemic. A shortage of staff and increase in the number of patients may necessitate cancellations of surgery, tests and other procedures. Staff may be reassigned from their usual roles to make best use of their skills. Retired and foreign-trained personnel may be asked to step in.

Negotiations and planning must take place within each province and territory, with existing colleges, associations and insurers in order that the process of reassignment and delegation may take place quickly and as smoothly as possible. (See the section on Emergency Preparedness Legislation.) Prior negotiation with licensing bodies and bargaining units to facilitate changing of job descriptions and the use of alternative workers during a pandemic will ease the transition and make the process more efficient. In the interpandemic period we recommend the jurisdictions take the following actions:

- Establish a process, in conjunction with existing emergency plans, to assess the work needed and skills required for each task. Jurisdictions need to look at the process of intake, reception, triage, clinical care, clean up, etc. and assess additional workers or sources of workers who already have the skills to be slotted into these jobs.
- Review the recommendations on patient assessment and management in the Clinical Care Guidelines which will indicate the needs for various skills at various points in patient care, and determine who may provide those during a pandemic.
- Communicate with health care professionals about pandemic needs.

d) Recruit professional staff for the pandemic response

Within facilities, consideration should be given to reassigning medical and nursing personnel with administrative, research and educational assignments to clinical duties.

Alternate sources of HCW would include, but are not limited to:

- retired physicians/nurses (need to be assurance that work during a pandemic would not affect their pension plans)
- physicians/nurses currently not working in clinical health care (i.e., working in education, administration, research, private industry)
- trainees (i.e., medical students and nursing students)
- registered nursing assistants
- patient care assistants
- emergency medical technicians
- veterinarians
- pharmacists
- therapists (respiratory/occupational/physio)
- technicians (laboratory, radiography)
- health care aides

Consider how best to recruit persons with health care qualifications but not currently working in the health services. Work with professional associations to determine how to communicate with their members prior to the pandemic about pandemic issues, and how they might communicate during the pandemic.

Provinces/territories may work with professional associations to ensure that persons with health care qualifications but not currently working in the health services maintain their qualifications and competencies. It is also important to establish a method for assessing professional qualifications and competence during the pandemic when people are being hastily recruited.

Developing and maintaining databases of staff is a time consuming and expensive task. Databases are only useful if kept up to date with licensing, skill set and contact information.

Most health care facilities will already have some type of database of their staff. Local facilities or authorities may wish to develop databases of workers with specific training (through licensing bodies and associations) or establish a co-operative arrangement with licensing bodies, associations or volunteer agencies that already maintain these lists.

Provinces/territories are encouraged to review professional and privacy legislation to determine how best to maintain such lists. It may be most appropriate both legally and effectively to ask professionals to volunteer their names as pandemic workers. It may also be appropriate to provide some form of incentive in the form of free training, subsidized license fees etc. to encourage professionals to volunteer their names.

Develop methods to ensure:

- Qualified workers can be contacted quickly and easily,
- Workers are placed where they are needed most, and
- Workers' training and qualifications are on record to ensure people have appropriate qualifications.

3.2.2 Review Emergency Legislation Pertaining to Health Care Workers

Emergency Preparedness Legislation makes many provisions for the management of workers during a crisis. This includes the recruitment of professional and other paid staff as well as volunteers, managing human resources and protection of people who volunteer. Pandemic planning should be integrated with the emergency plans of the jurisdictions as much as possible, in order to make best use of existing plans and resources. There is no assurance that a national emergency will be declared; jurisdictions should be prepared to operate under either condition. Therefore human resource planning should be based on existing plans without a declaration.

The following provisions of legislation are particularly applicable to human resource issues including:

- authority regarding licensing and scope of practice issues, and the ability of government to make unilateral changes during a crisis;
- safety and protection of workers, (one of the primary responsibilities);
- fair compensation;
- insurance, both site insurance, workers compensation and other forms of insurance;
- training;
- provision of clothing and equipment;
- protection of the jobs of workers who take leave to assist during the crisis.

Compelling Workers

Under Emergency Legislation provinces/territories may have the authority to designate "Essential Services" and workers and have the ability to compel people's time or property with due compensation as a last resort.

This issue has been raised both because of the existing shortage of health care workers and concerns that health care workers and others may refuse to work during a pandemic due to

changed job responsibilities, fear of infection, family responsibilities or other reasons. However, the Subgroup notes the extreme difficulty of enacting or enforcing such legislation and would strongly encourage the jurisdictions to review all other methods of obtaining health care workers, in advance of a pandemic.

3.2.3 Provide Training

Health care professionals, both those currently working in their fields and those working elsewhere or retired, as well as volunteers may benefit from training and communication regarding pandemic plans. As well as looking at specific skills, training and communication may focus on preparedness, changing roles and responsibilities, supervising volunteers, crisis management and emergency planning.

a) Start training and awareness building now

There will be very little time for effective training, once a pandemic is underway. Therefore, training should be incorporated into existing programs provided during the interpandemic period. By incorporating the skills needed during a pandemic into existing training, we reduce costs, improve efficiency and enhance readiness.

Training and awareness building will be needed in order to:

- motivate development of a response capacity, including identification of responsibilities and preparation activities, in acute care settings,
- facilitate an understanding of pandemic consequences, vaccination and ethical issues, among health care providers, prior to the pandemic,
- recruit workers willing to take on new responsibilities during the pandemic,
- encourage health care workers to maintain skills and licensing while working elsewhere, and
- develop specific skills related to pandemic influenza.

b) Identify skill/knowledge requirements

Health care workers will need to be skilled and knowledgeable in the fields of infection control, crisis management, worker supervision and working with grieving families, which may not be a significant part of their current responsibilities. In addition, it would be useful to expand and maintain the number of health care professionals and others with training in oxygen therapy and the use of ventilators and care of patients on ventilators.

Clerical skills in terms of patient tracking procedures will also be needed in overwhelmed health care facilities, as will people who can train patients and families in “self-care” thereby facilitating early discharge of patients. Ideally all health care workers should be trained in the principles of self-care, since they will be the primary conduit of information to their patients, families and communities. (See Clinical Care Guidelines and Tools Annex in the Plan for more information on self-care).

However, it is recognized that because of the difficulty of maintaining many of these skills without constant use, training programs targeting these skills should be developed for quick and efficient implementation once a pandemic is declared.

It is also advisable to develop a plan specifically for training or re-training of health care workers who are not currently working in health care, for example retirees.

c) Train the trainer

Health authorities and existing volunteer agencies, may establish programs to “train the trainers”. Through this process a pool of trained individuals can be maintained, during the interpandemic period, that would be available to implement training programs as quickly as possible at the onset of a pandemic.

To facilitate this process it would be essential to:

- identify and train those with knowledge of the tasks and adequate communication skills to act as trainers during the pandemic,
- identify training resources of use to on-the-job trainers,
- ensure there are adequate, easy to use procedures/instruction manuals for tasks such as admissions, patient tracking, etc., and
- use and share existing training programs and materials which can be adapted for pandemic influenza.

d) Plan now for training during the pandemic period

A great deal of training will have to be done once a pandemic is declared. Staff not currently working in health care and volunteers may only come forward once a pandemic is declared. In addition, it may be necessary to update training closer to the pandemic period. In order to ensure that this is done swiftly and efficiently during the pandemic, the following preparations should be made in advance:

- identify training which will take place following the declaration of pandemic,
- identify and obtain training resources which can be tested and used during the pandemic period,
- train the trainers (see above), and
- plan for where and how training will be delivered during the pandemic.

3.2.4 Consider Insurance and Licensing Issues

Insurance and liability coverage should be provided for trainees, volunteers, retirees and any other workers that are recruited to provide health care services during a pandemic. A more in-depth treatment of insurance and liability issues may be found in the annex on Non-Traditional Sites and Workers (Annex J). While these issues will be investigated at the national level, each province/territory will need to review existing legislation and policies to determine how this might be accomplished in their respective jurisdictions.

a) Liability insurance for workers and volunteers

The need to expand scopes of practice may have implications for liability protection/ malpractice insurance.

b) Workers' compensation

A Memorandum of Understanding (MOU) between the Office of Critical Infrastructure Protection and Emergency Preparedness (formerly Emergency Preparedness Canada), and the provinces/territories asserts that registered volunteers or persons compelled/ conscripted for emergency service work are protected by workers' compensation during emergency response, as long as they are registered. Some volunteer agencies, have a liability policy for their volunteers.

In some circumstances, volunteers who register with designated agencies may be covered by workers' compensation under emergency legislation. However, there are a number of issues to be resolved with workers, compensation boards at the provincial level:

- Does the policy require a declaration of Emergency and, at what level of government, or would the insurance come into effect once the Minister of Health declares a pandemic?
- Definition of health care workers for this purpose.
- Definition of volunteers for this purpose.
- Compensation is usually based on loss of income, however, in some cases volunteers may be retired, homemakers, or self-employed. Would compensation cover costs of the person's other responsibilities, such as family care?
- Would compensation be available if volunteers became ill rather than injured?
- Does this include Death and Dismemberment insurance?

Ensure such insurance is available independent of the need for a “Declaration of Emergency.”

c) Transfer of licensing between jurisdictions

(This section is under review pending discussion with provincial and territorial licensing organizations.)

Each province/territory needs to liaise with professional licensing bodies in their jurisdiction during the interpandemic period regarding licensing issues. In addition, professional licensing bodies may be asked to liaise and extend privileges to out of province professionals, based on their standing in another jurisdiction.

3.2.5 Immunization of Health Care Workers

While it is unlikely that a vaccine for the pandemic strain of influenza will be available in advance of the arrival of the pandemic in Canada, health care workers should be up-to-date with the other routinely recommended immunizations. Because immunizations require varying amounts of time and some require more than one dose for a person to develop immunity, it will likely be impossible to provide all of these once a pandemic is declared, or to provide them within an appropriate time frame given the lack of supplies and human resources.

Once a pandemic vaccine becomes available the vaccine will be distributed according to nationally agreed upon recommendations for prioritisation of vaccine recipients. A preliminary list of priority groups has been developed by the Vaccines Sub-group and is provided in Annex D of the Plan. The priority and composition of these groups may change based on the epidemiology of the pandemic. However it is widely recognized that health care workers are critical to the pandemic response and should be considered high priority for immunization during a pandemic.

3.2.6 Supporting Health Care Workers

During a pandemic, health care workers will need considerable personal support in order to keep working. During the interpandemic period, it is important to plan for how these services may be provided. Some strategies may require changes in policy, or even in legislation to ensure the availability of health care workers during the pandemic. Support provided to health care workers may include:

- Basic personal support – ensure food and services are available to HCWs on the job.
- Emotional support/grief counselling (aimed at permitting workers to continue to work and reduce loss of staff due to grief or traumatic stress).
- Family care (for children, seniors, sick family members who do not require hospitalization). This poses significant infection control concerns if gathering children or the elderly together for group care.
- Job protection for HCWs who move from other jobs during pandemic.
- Job protection for spouses who do family care to allow HCWs to work in health care.

In order to develop crisis programs, health authorities may build on existing employee support programs. This may involve:

- contacting existing support services,
- working with chaplains, counsellors and grief counsellors to develop crisis support programs including grief support and traumatic stress counselling,
- determining whether child, or family care, programs would be appropriate for the site(s) and where and how they would be set up (e.g. Contract with YM/YWCA), and
- reviewing legislation to determine if there is protection for spouses who take on child care responsibilities to permit HCWs to continue to work.

3.3 Human Resource Management During the Pandemic Period

If the pandemic arrives in other countries prior to arriving in Canada, information on the epidemiology of the pandemic strain will be circulated internationally as it becomes available. Planners will need to consider each piece of new information in terms of how this might impact their own population and potentially revise plans for the allocation of human resources based on this information.

The following steps/actions will need to occur during the pandemic period to optimise the human resource dependent response:

- organize the deployment of health care workers
- work with emergency management personnel and use emergency preparedness legislation as required
- implement training and communication plans
- manage insurance and licensing issues
- address immunization needs
- support health care workers

3.3.1 Organize the Deployment of Health Care Workers

At this point it will be necessary to activate the Human Resource Planning Team and recruit new members that may be vital to the implementation of previously developed plans. This will facilitate the coordinated management of human resource issues. Next steps are listed below.

- Identify key and supervisory positions and the people to fill them.
- Based on current staffing levels, and assuming a similar attack rate for staff as for the rest of the population, estimate additional staff needs for each region.
- Reassign staff where necessary.
- The Team, in conjunction with the local health authority, should update the inventory of current staff, number of beds, and acute care settings.
- Review worker and volunteer databases established in the interpandemic period.
- Call for staff – Communicate with the public and with health care workers that are not currently working, regarding the possible need for additional staff.
- Screen additional staff.
- Train – existing staff in special tasks and train additional staff.
- Deploy staff.

3.3.2 Coordinate Response with Emergency Management Personnel

During a pandemic the relationship between emergency measures organizations and personnel, and medical authorities and personnel will determine the overall response to the crisis. The best deployment of health care workers and other essential workers will result from well established, coherent communication between emergency preparedness personnel and health authorities.

Advance planning should focus on establishing communication strategies and protocols which will permit on-going direct, daily integrated communication during the period of the pandemic. Knowledge and implementation of existing legislation, strategies and resources and a transparent means of communicating with health care workers and other essential workers, as well as the public will permit authorities to efficiently implement adequate human resource management strategies during the crisis.

3.3.3 Implement Training and Communication Plans

During the pandemic period staff and volunteers will be identified who need additional training. This will include training such as: working with ventilated patients, and basic support skills such as sterilization procedures, management of admissions etc. to permit licensed trained health care workers to take on additional tasks. It is vital that the training be quickly and easily available in formats that are short, manageable and preferably “on-the-job” where possible.

- Identify experienced people, those with knowledge of the tasks and adequate communication skills and provide them with resources to permit them to train others. (See Train the trainers above.) Ensure trainers and experienced people remain available for consultation and training on an on-going basis.
- Review training programs and emphasize skill sets based on the epidemiology of the disease.
- Use the time between the WHO/Health Canada declaration of pandemic, and the arrival of the first wave in the jurisdiction to train as many staff and volunteers as possible in general and specific tasks.
- Call on existing agencies such as St. John Ambulance and the Red Cross to ramp up existing training programs with an emphasis on tasks required to treat influenza patients.
- Maintain records of trained individuals to ensure best deployment of those individuals.

3.3.4 Manage Insurance and Licensing Issues

It will be important to communicate any necessary changes to licensing and insurance provisions to all stakeholders. This will require a thorough review of provisions for insurance in the provincial/territorial emergency plan, a review of licensing issues and communication with licensing bodies, associations, colleges, etc. regarding this issue.

If insurance and/or licensing arrangements require activation of some form of legislation, bylaw or declaration, inform the Minister of Health and other appropriate authorities.

Inform chiefs of staff, managers, supervisors and human resource professionals in health care settings, of changes in licensing and insurance and what that will mean for flexibility in staff deployment, additional staffing, requirements for deployment, or any other provisions of legislation, licensing or insurance with which the institution must comply.

3.3.5 Address Immunization Needs

Health care facilities may have to provide qualified personnel capable of administering immunizations, under the guidance of public health authorities, to staff clinics targeting staff and volunteers at their site.

3.3.6 Support Health Care Workers

Review plans made during the interpandemic period to provide support to all health care workers including volunteers and retired persons, to enable them to continue working. During the pandemic authorities may:

- Establish personal support services providing on-site food delivery, nap rooms, etc.
- Set up counselling services (find an office, determine a schedule).
- Call in additional counsellors, grief counsellors, chaplains, clergy, clerical support.
- Set up child/family care services.
- Notify staff of how to access these services.
- Notify staff of legislated protections such as protection for job of spouse while caring for children.

3.4 Human Resource Management During the Post-Pandemic Period

Activities during this period will focus on the demobilization of staff and volunteers. The pandemic response, in terms of human resources, should be reviewed and evaluated so that plans may be revised as necessary during this or the interpandemic period.

Consideration should be given to methods to formally recognize the efforts of all workers involved in the pandemic response.

Evaluation of Bed Capacity

These worksheets have been designed to assist facilities in planning for an influenza pandemic. It can be used to complement centralized bed management systems, or used on their own to evaluate bed capacity and how to achieve maximum bed utilization. Facilities should determine the maximum number of beds available and the numbers of hours of care needed to staff the beds. During an influenza pandemic there would most likely be a change in acuity of beds.

Who has responsibility for collecting this information? (Check your facility's emergency plan.)		
Position Title		
Who will have authority and responsibility to apply this information during a Pandemic?		
Position Title		
1. What is the total number of non-ventilated beds, without oxygen supply, which are:		
a) Currently open and staffed?		
b) Which could be available during an emergency if extra resources were available in the short term?	In 72 hours	In 7 days
What are the limiting factors (staffing, equipment, physical space, other)?		
2. What is the total number of non-ventilated beds, with oxygen supply, which are:		
a) Currently open and staffed?		
b) Which could be available during an emergency if extra resources were available in the short term?	In 72 hours	In 7 days
What are the limiting factors (staffing, equipment, physical space, other)?		
3. What is the total number of ventilated beds which are:		
a) Currently open and staffed?		
b) Which could be available during an emergency if extra resources were available in the short term?	In 72 hours	In 7 days
What are the limiting factors (staffing, equipment, physical space, other)?		
4. If a directive came to stop all elective surgery/admission:		
a) How many beds would become available?	In 72 hours	In 7 days
b) How many beds, with oxygen supply, would become available?		
c) How many ventilated beds would become available?		

5. How many extra emergency ventilatory beds could your hospital create? [NB. Consider use of all ventilator capacity, including time-cycled ventilators, anaesthetic machines, CPAP, BiPAP, and the availability of oxygen/suction and air-supply, recovery and operating rooms and neuroscience beds.]		
a) Assuming current staffing levels (redeployment of staff permitted)	In 72 hours	In 7 days
b) Assuming additional resources for staffing:		
What are the limiting factors (staffing, equipment, physical space, other)?		
6. Does your hospital have any excess capacity to assist other health care facilities or the community, such as provisions of meals, sterilization capacity?		
7. Does your hospital have an affiliation with a Health Care Facility, which may have extra bed capacity?		
Affiliation	Number of Beds	
▪ Long-Term Care Facility		
▪ Acute Detoxification Unit		
▪ Rehabilitation Facility		
▪ Crisis Unit		
▪ Other Type		

Inventory of Beds (Work Sheet)									
Type of bed	Total number of physical beds in facility	Number of physical beds with oxygen supply	Number of currently operating beds (opened and staffed)	Number of currently operating beds with oxygen supply	Estimate current proportion of elective vs emergency cases/beds	Number of beds able to be staffed using current resources	Space for beds available, with oxygen outlet, no physical bed available	Space for beds available, no oxygen outlet no physical bed available	Comments (e.g., unique equipment, special purpose)
Medical									
Special medical/stepdown									
Surgical									
Special surgical									
Coronary care*									
Intensive care*									
Paediatric									
Obstetric									
Special care nursery									
NICU									
Day ward									
Recovery room*									
Sleep laboratory									
Closed wards									
Other									
TOTAL									

* denotes areas currently used for ventilation which could be used for emergency ventilation

Inventory of Ventilators (Work Sheet)											
Types of ventilators	Intensive care	Coronary care	Special medical/step-down	Recovery room	Operating room	Emergency department	Storage	In repair	Sleep study laboratory	Physiotherapy	Other
Oxylog											
Bird											
CPAP spont. breathing											
BiPAP spont. breathing											
TOTAL											

Emergency Ventilatory Capacity Considerations (Work Sheet)									
Property	Intensive care	Coronary care	High dependency	Recovery room	Operating room	Emergency department	Neuro-science	Sleep study laboratory	Other
Suction									
Oxygen outlet									
Medical air outlet									
Airflow (negative pressure)									
Airflow (positive pressure)									
Room monitoring									
Physical bed									
Space, but no physical bed									

Guidelines for the Management of Mass Fatalities During an Influenza Pandemic

Date of Latest Version: February 2004

Note:

- See Background section of the Plan for information on the latest pandemic phase terminology.
- This annex may be out-of-date with respect to other planning activities and policy decisions.
- This annex is expected to be updated in 2007.

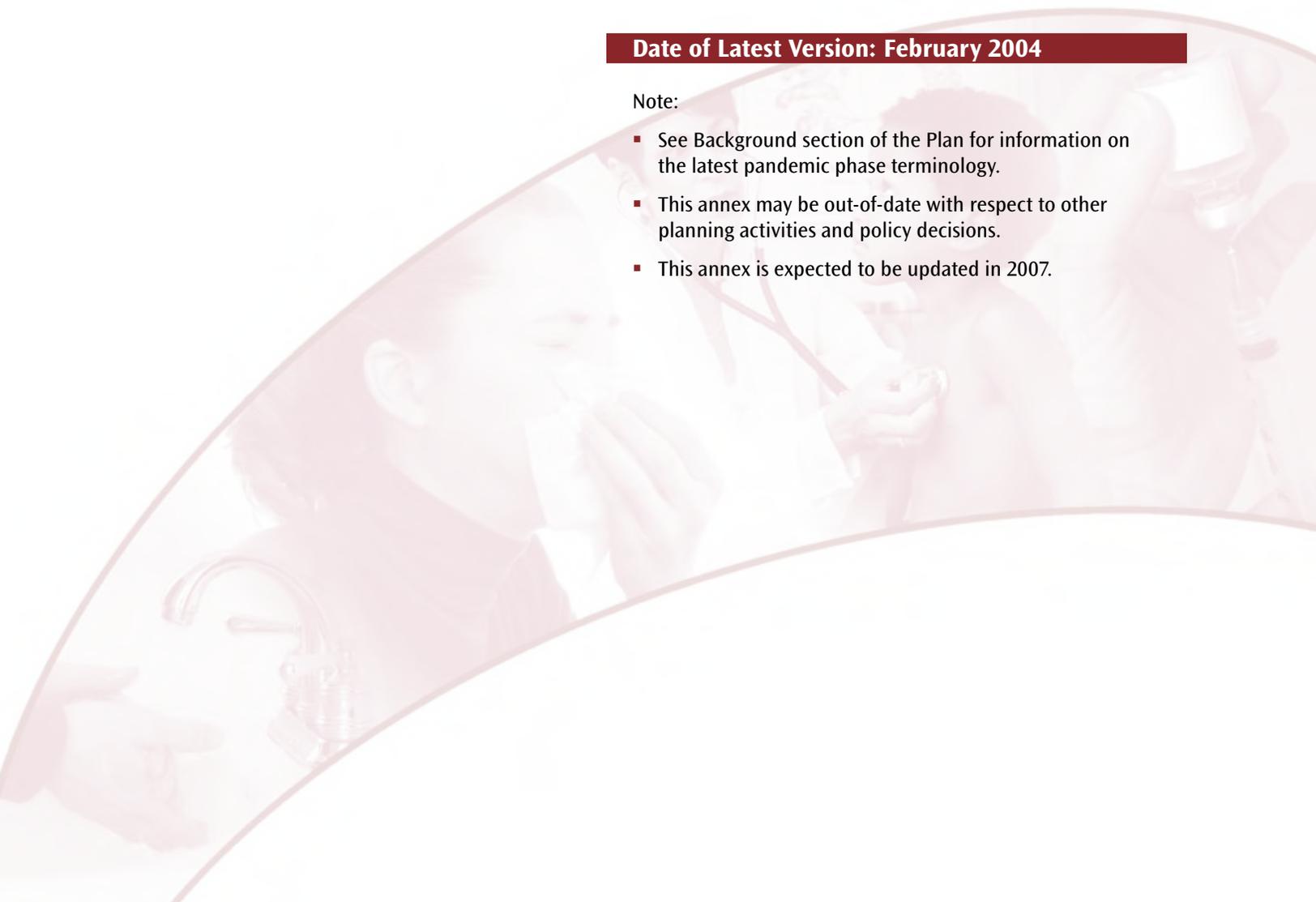


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During a pandemic, local authorities will have to be prepared to manage additional deaths due to influenza, over and above the number of fatalities from all causes currently expected during the inter-pandemic period. Within any locality, the total number of fatalities (including influenza and all other causes) occurring during a 6- to 8-week pandemic wave is estimated to be similar to that which typically occurs over 6 months in the inter-pandemic period. This guideline aims to assist local planners and funeral directors in preparing to cope with large-scale fatalities due to an influenza pandemic. A number of issues have been identified, which should be reviewed with coroners/ medical examiners, local authorities, funeral directors, and religious groups/authorities.

1.0 Planning for Mass Fatalities

In order to identify planning needs for the management of mass fatalities during a pandemic, it is important to examine each step in the management of a corpse under normal circumstances and then to identify what the limiting factors will be when the number of corpses increase over a short period of time. The following table identifies the usual steps. Possible solutions or planning requirements are discussed in further detail in the sections that follow this table.

Steps	Requirements	Limiting Factors	Planning for Possible Solutions/ Expediting Steps
Death pronounced	<ul style="list-style-type: none"> person legally authorized to perform this task 	<ul style="list-style-type: none"> if death occurs in the home then one of these people will need to be contacted availability of people able to do this task 	<ul style="list-style-type: none"> provide public education re. how to access an authorized person consider planning an on call system 24/7 specifically for this task
Death certified	<ul style="list-style-type: none"> person legally authorized to perform this task 	<ul style="list-style-type: none"> legally, may not necessarily be the same person that pronounced the death 	<ul style="list-style-type: none"> consider “collecting” corpses and having one authorized person perform this task en masse to improve efficiency
Body wrapped	<ul style="list-style-type: none"> person(s) trained to perform this task body bags 	<ul style="list-style-type: none"> supply of human and physical (body bags) resources if death occurs in the home: the availability of these requirements 	<ul style="list-style-type: none"> consider developing a rotating 6 month inventory of body bags, given their shelf life consider training or expanding the role of current staff to include this task provide this service in the home in conjunction with pronouncement and transportation to morgue

Steps	Requirements	Limiting Factors	Planning for Possible Solutions/ Expediting Steps
Transportation to the morgue	<ul style="list-style-type: none"> in hospital: trained staff (orderly?) and stretcher outside hospital: informed person(s), stretcher and vehicle suitable for this purpose 	<ul style="list-style-type: none"> availability of human and physical resources 	<ul style="list-style-type: none"> in hospital: consider training additional staff working within the facility consider keeping old stretchers in storage instead of discarding look for alternate suppliers of equipment that could be used as stretchers in an emergency e.g., trolley manufacturers outside hospital: provide public education or specific instructions through a toll-free phone service re. where to take corpses if the family must transport
Morgue storage	<ul style="list-style-type: none"> a suitable facility that can be maintained at 4 to 8 degrees Celsius 	<ul style="list-style-type: none"> capacity of such facilities 	<ul style="list-style-type: none"> identify and plan for possible temporary morgue sites
Autopsy if required/ requested	<ul style="list-style-type: none"> person qualified to perform autopsy and suitable facility with equipment 	<ul style="list-style-type: none"> availability of human and physical resources may be required in some circumstances 	<ul style="list-style-type: none"> ensure that physicians and families are aware that an autopsy is not required for confirmation of influenza as cause of death
1) Cremation*	<ul style="list-style-type: none"> suitable vehicle of transportation from morgue to crematorium availability of cremation service a cremation certificate 	<ul style="list-style-type: none"> capacity of crematorium/ speed of process availability of coroner or equivalent official to issue certificate 	<ul style="list-style-type: none"> identify alternate vehicles that could be used for mass transport examine the capacity and surge capacity of crematoriums within the jurisdiction discuss and plan appropriate storage options if the crematoriums become backlogged discuss and plan expedited cremation certificate completion processes

Table 1. Usual Process for Corpse Management

Steps	Requirements	Limiting Factors	Planning for Possible Solutions/ Expediting Steps
2) Embalming**	<ul style="list-style-type: none"> suitable vehicle for transportation from morgue trained person embalming equipment suitable location 	<ul style="list-style-type: none"> availability of human and physical resources capacity of facility and speed of process 	<ul style="list-style-type: none"> consult with service provided regarding the availability of supplies and potential need to stockpile or develop a rotating 6 month inventory of essential equipment/supplies discuss capacity and potential alternate sources of human resources to perform this task e.g. Retired workers or students in training programs consider “recruiting” workers that would be willing to provide this service in an emergency
Funeral service	<ul style="list-style-type: none"> appropriate location (s), casket (if not cremated), funeral director 	<ul style="list-style-type: none"> availability of caskets availability of location for service and visitation 	<ul style="list-style-type: none"> contact suppliers to determine lead time for casket manufacturing and discuss possibilities for rotating 6 month inventory consult with the FSAC to determine surge capacity and possibly the need for additional sites (e.g., use of churches etc. for visitation)
2a) Transportation to temporary vault or burial site	<ul style="list-style-type: none"> suitable vehicle and driver 	<ul style="list-style-type: none"> availability of human and physical resources 	<ul style="list-style-type: none"> identify alternate vehicles that could be used for this purpose consider use of volunteer drivers
2b) Temporary vault storage	<ul style="list-style-type: none"> access to and space in a temporary vault 	<ul style="list-style-type: none"> temporary vault capacity and accessibility 	<ul style="list-style-type: none"> expand capacity by increasing temporary vault sites
2c) Burial	<ul style="list-style-type: none"> grave digger, space at cemetery 	<ul style="list-style-type: none"> availability of grave diggers and cemetery space extreme cold and heavy snowfall 	<ul style="list-style-type: none"> identify sources of supplementary workers
<p>* cremated bodies are not usually embalmed; families may choose to have a funeral service followed by cremation or to have the body cremated first and a memorial service later.</p> <p>** bodies to be buried may be embalmed and may need to be stored in a temporary vault prior to burial.</p>			

1.1 General Planning Considerations

In order to develop guidelines or adjust existing plans to suit the pandemic situation, local pandemic planners should ensure that the following persons are involved in mass fatality planning:

- the Coroner Office/Branch,
- the Medical Officer of Health,
- the Emergency Response Team,
- representatives of the Funeral Services Association of Canada (FSAC) and/or the local funeral director,
- representatives from local health care facilities, and
- representatives of local religious and ethnic groups.

Existing disaster plans may include provisions for mass fatalities but should be reviewed and tested regularly, to determine if these plans are appropriate for the relatively long period of increased demand which may occur in a pandemic, as compared to the shorter response period required for most disaster plans. There are currently no plans to recommend mass burials or mass cremations. This would only be considered in the most extreme circumstances.

Since it is expected that most fatal influenza cases will seek medical services prior to death, hospitals, nursing homes and other institutions (including non-traditional sites) must plan for more rapid processing of corpses. These institutions should work with the pandemic planners and the FSAC and coroner office to ensure that they have access to the additional supplies (e.g., body bags) and can expedite the steps, including the completion of required documents, necessary for efficient corpse management during a pandemic.

In order to deal with the increase in fatalities, some municipalities will find it necessary to establish temporary morgues. Plans should be based on the capacity of existing facilities compared to the projected demand, for each municipality. Local planners should make note of all facilities available, including those owned by religious organizations. Some religious groups maintain facilities including small morgues, crematoria and other facilities that are generally operated by volunteers. Access to these resources should be discussed with these groups as part of the planning process during the interpandemic period.

In the event that local funeral directors are unable to handle the increased numbers of corpses and funerals, it will be the responsibility of municipalities to make appropriate arrangements. Individual municipalities should work with local funeral directors to plan for alternate arrangements.

Planning should also include a review of death documentation requirements and regulatory requirements that may affect the timely management of corpses.

1.2 Role of the Funeral Service Association of Canada (FSAC)

It is recommended that all funeral directors contact their Medical Officer of Health to become involved in their disaster and pandemic planning activities with respect to the management of mass fatalities at the local level. The national Mass Fatalities sub-group for pandemic influenza planning has recommended that funeral directors consider it a part of their professional standards to make contingency plans for what would happen if they were incapacitated or overwhelmed. This recommendation is being taken forward to the association, which has an established disaster planning committee. It is expected that this committee will put forward a recommendation to the provincial/territorial associations to set up disaster plans.

Currently, FSAC is planning to set up three containers to be placed at three military bases across Canada (probably Edmonton, Toronto area and Halifax). Each container would be a fully organized temporary morgue with all necessary equipment. These are intended for use in such disaster scenarios as major fire, flood or aircraft crash but might be useful as adjuncts to large auxiliary hospitals in a pandemic. FSAC and funerary supplies companies are setting up these containers; any materials used would be re-supplied by the user.

Members of the FSAC board are on the Funeral Supply Coalition Council of Canada. FSAC is likely to take a role in supply (e.g., fluids, body bags and caskets) management for mass fatalities related to a pandemic.

The FSAC is currently updating information regarding health concerns and funeral service issues, which will be available through a publicly accessible web site.

1.3 Autopsies

Many deaths in a pandemic would not require autopsies since autopsies are not indicated for the confirmation of influenza as the cause of death. However, for the purpose of public health surveillance (e.g., confirmation of the first cases at the start of the pandemic), respiratory tract specimens or lung tissue for culture or direct antigen testing could be collected post-mortem. Serological testing is not optimal but could be performed if 8-10 mL of blood can be collected from a subclavian puncture post-mortem. Permission will be required from next-of-kin for this purpose.

Any changes to regular practices pertaining to the management of corpses and autopsy requirements during pandemic situations, would require the authorization of the Chief Medical Examiner or Coroner.

If a physician requires that an autopsy be performed, normal protocols will be followed, including permission from the next-of-kin. In cases where the death is reportable to a Medical Examiner or Coroner, the usual protocols prevail based on provincial legislation.

1.4 Preparations for Funeral Homes and Crematoria

In a pandemic, each individual funeral home could expect to have to handle about 6 months work within a 6- to 8-week period. That may not be a problem in some communities, but funeral homes in larger cities may not be able to cope with the increased demand.

Individual funeral homes should be encouraged to make specific plans during the interpandemic period regarding the need for additional human resources during a pandemic situation. For example, volunteers from local service clubs or churches may be able to take on tasks such as digging graves, under the direction of current staff.

Crematoriums will also need to look at the surge capacity within their facilities. Most crematoriums can handle about one body every 4 hours and could probably run 24 hours to cope with increased demand. Cremations have fewer resource requirements than burials and, where acceptable, this may be an expedient and efficient way of managing large numbers of corpses during a pandemic.

1.5 Planning for Temporary Morgues

Additional temporary cold storage facilities may be required during a pandemic, for the storage of corpses prior to their transfer to funeral homes. A temporary morgue must be maintained at 4-8° C. However, corpses will begin to decompose in a few days when stored at this temperature. If the body is not going to be cremated, plans to expedite the embalming process should be developed since in the case of a pandemic, bodies may have to be stored for an extended period of time. In jurisdictions where a timely burial is not possible due to frozen ground or lack of facilities, corpses may need to be stored for the duration of the pandemic wave (6 to 8 weeks).

Each municipality should make pre-arrangements for temporary morgues based on local availability and requirements. The resource needs (e.g. body bags) and supply management for temporary morgues should also be addressed. The types of temporary cold storage to be considered may include refrigerated trucks, cold storage lockers or arenas.

Refrigerated trucks can generally hold 25-30 bodies without additional shelving. To increase storage capacity, temporary wooden shelves can be constructed of sufficient strength to hold the bodies. Shelves should be constructed in such a way that allows for safe movement and removal of bodies (i.e., storage of bodies above waist height is not recommended). To reduce any liability for business losses, municipalities should avoid using trucks with markings of a supermarket chain or other companies, as the use of such trucks for the storage of corpses may result in negative implications for business.

Arenas and curling rinks, where the required temperature of 4-8° C can be maintained, are other options for temporary morgues. Using local businesses for the storage of human remains is not recommended and should only be considered as a last resort. The post-pandemic implications of storing human remains at these sites can be very serious, and may result in negative impacts on business with ensuing liabilities.

1.6 Capacity of and Access to Vaults

A vault is a non-insulated storage facility for remains that have already been embalmed, put into caskets and are awaiting burial. In most places in Canada extra corpse storage facilities already exist, as they are often needed from January to April when the ground is frozen and burials are difficult to perform. Although larger cities may be able to open burial plots in winter, smaller communities do not have the equipment or permanent staff to do this.

The accessibility of vaults during the winter should be assessed. A vault may be situated in the back of cemeteries, with entrances that are partially below ground level or in close proximity to headstones, so that a snow blower or plough would have difficulty creating a path of access without damaging some headstones.

In preparation for a pandemic each community should identify the capacity of existing vaults and address access issues for temporary storage. In addition, the need for the creation of new temporary vaults, to meet the increased demand during a pandemic should be addressed. This temporary vault should be non-insulated, have some security features such as covered windows and locks on doors.

2.0 Other Technical Considerations

2.1 Death Registration

Death registration is a provincial/territorial (P/T) responsibility and each P/T has its own laws, regulations, and administrative practices to register a death. Moreover, there is a distinction between the practices of pronouncing and certifying a death. For example, in Ontario physicians, nurses, and in some circumstances police and ambulance attendants may pronounce a person dead. Only physicians, and a small group of designated nurses in narrowly defined circumstances may certify death.

In the pandemic situation, with the increased number of deaths, each jurisdiction must have a body collection plan in place to ensure that there is no unnecessary delay in moving a body to the (temporary) morgue. If the person's death does not meet any of the criteria for needing to be reported to a coroner, then the person could be moved to a holding area soon after being pronounced dead. Then, presumably on a daily basis, a physician could be designated to complete the death certificate.

Funeral directors generally have standing administrative policies that prohibit them from collecting a body from the community or an institution until there is a completed certificate of death. In the event of a pandemic with many bodies, it seems likely that funeral directors could work out a more flexible practice if directed to do so by some central authority (e.g. provincial attorney general, registrar of vital statistics). These special arrangements must be planned in advance of the pandemic and should include consideration of the regional differences in resources, geography, and population.

2.2 Infection Control

The Infection Control and Occupational Health Guidelines (Annex F of the Canadian Influenza Pandemic Plan) provide general recommendations on infection control for health care facilities and non-traditional sites during a pandemic. However, special infection control measures are not required for the handling of persons who died from influenza, as the body is not “contagious” after death. Training in the routine infection control practice and additional precautions is available through the FSAC. <<http://www.fsac.ca/>>.

Visitations could be a concern in terms of influenza transmission amongst attendees, particularly in smaller communities. For example, in P.E.I., the average attendance at a visitation is 1,000 to 1,400 people; visitations in larger centres are typically a fraction of that size. The Guidelines to Infection Prevention and Control and Occupational Health (Annex F of the Pandemic Plan), lists several recommendations regarding public gatherings. It is the responsibility of the Medical Officers of Health to place restrictions on the type and size of public gatherings if this seems necessary to reduce the spread of disease. This may apply to funerals and religious services. Medical Officers of Health should plan in advance for how such restrictions would be enacted, and enforced, and for consistency and equitability of the application of any bans.

Families requesting cremation of their deceased relative are much less likely to request a visitation, thus reducing the risk of spreading influenza through public gatherings.

2.3 Transportation

No special vehicle or driver licence is needed for transportation of a corpse. Therefore, there are no restrictions on families transporting bodies of family members if they have a death certificate.

Transportation of bodies from their place of death to their place of burial in northern and isolated communities may become an issue, especially if this requires air transport. Local pandemic planners should consult existing plans for these communities and determine what changes can be made to meet the increased demand during a pandemic.

2.4 Supply Management

FSAC is recommending to funeral directors that they not order excessive amounts of supplies such as embalming fluids, body bags, etc., but that they have enough on hand in a rotating inventory to handle the first wave of the pandemic (that is enough for 6 months of normal operation). Fluids can be stored for years, but body bags and other supplies have a limited shelf life. A supply list for temporary morgues will be accessible through FSAC. Cremations generally require fewer supplies since embalming is not required.

A list of current suppliers is provided in Appendix 1.

Families having multiple deaths are unlikely to be able to afford multiple higher-end products or arrangements. Funeral homes could quickly run out of lower-cost items (e.g. inexpensive caskets such as cloth and some wooden caskets) and should be prepared to provide alternatives.

3.0 Social/Religious Considerations

3.1 Special Populations

A number of religious and ethnic groups have specific directives about how bodies are managed after death, and such needs must be considered as a part of pandemic planning. First Nations, Inuit, Jews, Hindus, Muslims, all have specific directives for the treatment of bodies and for funerals. The wishes of the family will provide guidance, however, if no family is available local religious or ethnic communities can be contacted for information. For example, in the case of First Nations peoples, mechanisms currently exist to communicate with band councils for this purpose (established to deal with archeological issues) and medical examiners should contact the band council of the individual where this is possible.

As a result of these special requirements, some religious groups maintain facilities such as small morgues, crematoria, and other facilities, which are generally operated by volunteers. Religious groups should be contacted to ensure these facilities and volunteers are prepared to deal with pandemic issues.

Religious leaders should be involved in planning for funeral management, bereavement counselling, and communications, particularly in ethnic communities with large numbers of people who do not speak the official languages.

3.2 Northern and Isolated Communities

Northern and isolated communities face particular issues in dealing with large numbers of fatalities. The following issues make the preparation, storage and burial/disposal of large numbers of corpses very challenging in such communities.

- The lack of funeral service personnel and other resources.
- The extreme cold weather and heavy snowfalls in winter result in difficulties with burials, and in difficulties with the transportation of corpses.
- In remote areas where families live vast distances apart, corpses may have to be transported a long way for burial/disposal. This may be challenging for areas with few plane flights and no road access or poor road surface conditions. The large distances also pose a challenge for the transportation of funeral directors and funeral supplies.
- Permafrost, boggy land and other geographical features also pose a challenge to transportation and burial.

Planners responsible for these jurisdictions should ensure that local pandemic plans address these issues.

List of Current Suppliers

Embalming fluids and suppliers:

- H.S. Eckels and Company, Guelph, Ontario
- Esco of Rexdale, Ontario
- Les Fournitures, J.C.R. Inc., Vanier, Québec
- Dodge Chemical, Mississauga, Ontario

Casket suppliers:

- Alton Caskets
- J.I. Astley & Associates
- Batesville Canada
- Bernier Caskets Inc./Cercueils Bernier Inc.
- Classic Casket Distributors, Limited.
- Colonial Caskets Limited
- Cercueils Concept Inc/Concept Caskets Inc.
- Cormier & Gaudet
- Exquisite Enterprises, Inc.
- Imperial Evergreen Casket Corporation
- Imperial Casket (Calgary) Limited
- Imperial Casket (Saskatchewan) Limited
- Imperial Casket (Manitoba) Limited
- Imperial Legacy Caskets Limited
- Industries Maximel Inc.
- Cercueils Magog Caskets
- Northern Casket (1976) Limited
- Cercueils South Durham Caskets
- St. Lawrence Casket Co. Inc.
- Trans-Global Casket
- Victoriaville Funeral Supplies, Inc.
- Winkler Caskets Co. Limited

Guidelines for Non-Traditional Sites and Workers

Date of Latest Version: February 2004

Note:

- This annex may not contain up-to-date information on the antiviral strategy. Refer to the Preparedness section of the Plan and Annex E for this information.
- See Background section of the Plan for information on the latest pandemic phase terminology.
- This annex may be out-of-date with respect to other planning activities and policy decisions.
- This annex is expected to be updated in 2007.

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Introduction

In influenza pandemics over 50% of persons may be infected and the majority of illnesses and deaths will tend to occur over a period of six to eight weeks in any one location. Epidemiologic data from influenza epidemics and past pandemics show that 15% to 35% of the population could become clinically ill. Consequently, even a low frequency of complications result in marked increases in rates of hospitalizations. An estimate of the health and economic impact of a pandemic in Canada has been performed using a model developed by Meltzer and colleagues, CDC, Atlanta (<<http://www.cdc.gov/ncidod/eid/vol5no5/meltzer.htm>>). Based on this model it is estimated that between 2.1 and 5.0 million people would require outpatient care, between 34 thousand and 138 thousand people would require hospitalization and between 11 thousand and 58 thousand people would die in Canada during an influenza pandemic.

Due to the large number of patients who would require medical services during an influenza pandemic, communities and health care organizations must have guidelines in place that will address what will be done if health care organizations are overwhelmed. The use of non-traditional sites (NT sites) for the provision of medical care and the need for additional human resources, including volunteers and other health care or non-health care workers, must be considered as a strong possibility and planned for accordingly. Legislative, management and professional authorities will have to be clearly defined at the local level.

This document is divided into two main sections. The first section provides guidelines regarding the utilization and administration of NT sites, and the preparedness and operational activities that should take place with respect to NT sites during the interpandemic, pandemic and post-pandemic periods. The second section focuses on the need for and identification of additional human resources as part of pandemic planning, and also identifies activities by each pandemic period.

Section 1: Non-Traditional Sites

1.1 Definition of a Non-Traditional Site

The following is a definition of a non-traditional site (NT site) for the purposes of planning for an influenza pandemic.

A non-traditional site is a site that is:

- a) currently not an established health care site, or
- b) is an established health care site that usually offers a different type or level of care.

The functions of a non-traditional site will vary depending on the needs of the community but will focus on monitoring, care and support of influenza patients during an influenza pandemic.

1.2 Potential Roles of Non-Traditional Sites

The role of any NT site will depend on the needs of the community and the resources available. It is expected that NT sites will be used during a pandemic for three main purposes:

- the care of patients who are not critically ill when hospitals are overloaded,
- as domiciliary care for individuals unable to care for themselves at home, and
- as a “step-down” unit for the care of stable patients that have been transferred from acute care hospitals.

Where possible care at non-traditional sites should be limited to supportive care or palliation for influenza patients. Critical care would likely not be possible within these sites and should remain in the acute care setting. Persons with immunosuppressive illness or communicable diseases other than influenza (e.g. tuberculosis) should not be admitted to these sites.

In communities with a high proportion of elderly or high risk persons, the role of the NT site may need to be expanded to include the provision of health care services specifically related to dealing with the exacerbation of co-morbidities (e.g. chronic heart or lung disease, diabetes) in these groups.

Depending on the impact of the pandemic and the health care resources available in the community, NT sites may serve several functions. They may be set-up as triage centres, mobile health units, acute care or sub-acute care providers, clinics, or emergency residential facilities for those that cannot care for themselves at home or for cases that usually live with a high-risk individual.

1.3 Administrative Options for Non-Traditional Sites

NT sites may be established as a “satellite site” of an acute care facility or other health care facility, or as a “free-standing site”. The “satellite site” model is advantageous since it does not require establishment of a separate administrative structure. Specifically, linkage with an existing acute care facility or other health care facility would facilitate the following:

- prompt implementation of an administrative structure,
- ordering, tracking and maintenance of equipment and supplies,

- implementation of record keeping and patient tracking systems,
- implementation/establishment of nursing protocols and patient care guidelines,
- sharing of expertise and human resources between sites,
- access to services such as sterilization, laboratory services, pharmacy services, laundry, food services,
- referrals between the site and the affiliated health care facility, and
- extension of liability, workers compensation and other insurance programs to the satellite site.

The satellite site is the recommended administrative option, however, where it is not possible to set-up a “satellite site” the establishment of “free-standing sites” will be necessary. Planning for the administration of “free-standing sites”, including how the issues listed above will be dealt with at the site, will need to be completed during the inter-pandemic period. It is recommended that pandemic planning be incorporated into the existing emergency response plan.

Triage, transfer and transport agreements between the NT site and the affiliated health care facility or referral hospital need to be established.

Regardless of the administrative structure of the site, an individual or team needs to be designated to oversee the care provided in each NT site. This person/team should monitor patient flow, maintain a log of patient activity including patient outcome, and monitor availability of supplies. Delegation of these responsibilities to ensure ongoing and consistent administration of the site needs to be planned for in advance.

1.4 Insurance Issues

In planning for the establishment of NT sites during a pandemic it is important that insurance needs are considered and that provisions for appropriate insurance are made. Do not assume that the insurance covering the site for its usual use will extend to cover its use as an emergency medical site. Specifically, fire/damage/theft insurance and site liability insurance will be required for NT sites.

1.5 National Emergency Stockpile System

The National Emergency Stockpile System (NESS) was primarily developed for use in crises such as natural disasters, earthquakes, or other emergencies in which there is a sudden need for supplies and equipment to deal with a large number of people with varying medical needs. The program involves the purchase, packaging, shipping and storing of supplies and equipment organized into “kits” designed to meet specific emergency medical needs. The components of the “kits” are packaged and stored in warehouses across Canada to facilitate timely distribution. The NESS should not be confused with emergency stockpiles that may exist within each province or territory.

In the event of a pandemic, specific kits or units from the stockpile could potentially be used to facilitate reception, intake, triage and provision of medical and social services at a NT site. The following is a brief description of the types of kits/units available through the NESS.

- *Emergency Hospital* - capable of providing support to the existing health care system by the provision of acute and short term medical care for up to 200 patients. Also has the adaptability to support social services functions (i.e., evacuation centres, reception areas, shelters, etc).
- *Advanced Treatment Centre* - capable of providing early medical and limited surgical procedures in a ‘field’ or operational environment; also used to support the movement of patients to

other health care facilities. Can also support the movement of evacuees and the operations of shelters, evacuation centres, reception areas, etc.

- *Casualty Collecting Unit* - capable of providing immediate first aid care and movement of patients to other health care facilities. Also can support the movement of evacuees and the operations of evacuation centres, shelters, reception areas, etc.
- *Reception Centre Kit* - provides supplies, and registration and inquiry materials for the set-up and operation of reception functions for evacuation centres/shelters.
- *Mobile Feeding Unit* - provides an emergency feeding capability in a 'field' environment, or where normal food services are not available (equipment and supplies, not food).
- *Trauma Kit* - consists of first aid, intubation equipment, IV solutions and medical components to support first line response, patient triage and stabilization. Is useful in a patient staging facility (mini clinics, advanced treatment centres, etc.).
- *Mini Clinic* - intended to supplement existing medical care facilities in a disaster situation that overwhelms their system (e.g. a hospital emergency room). It would be located adjacent to these facilities to triage and treat the less seriously injured, so that the main facility remains clear to accept and treat the seriously injured.

The equipment supplied is older but well maintained. New equipment is being added to certain units and others are being reconfigured to be more effective. Transportation of these materials is dependent upon commercial or military vehicles and requires access by road or, for some items, an airport that will accept a Hercules aircraft.

In the event of a local emergency that overwhelms available municipal resources, the protocol for accessing the NESS program is that the municipality contacts the provincial/territorial emergency management authorities. Release of equipment or supplies must then be coordinated through the Provincial/Territorial Health, or Social Services Director. In certain cases the distribution of drugs is handled directly by provincial Chief Medical Officers of Health.

The NESS equipment and supplies are owned by the Office of Emergency Services, Health Canada and are made available to the provinces/territories on a loan basis. The province/territory administers this Federal program under guidelines established by the Office of Emergency Services and through 'Memoranda of Agreement' between the Minister of Health, Health Canada and the Provincial/Territorial Health and Social Services Minister(s). In a national emergency or large-scale disaster, the authority for the release and use of the stockpile equipment remains with the Director of Emergency Services, Health Canada. To obtain an Emergency Hospital or other unit, a Provincial Emergency Services Director must apply to the Director, Centre for Emergency Preparedness and Response, Health Canada.

For more information on the National Emergency Stockpile System contact your provincial/territorial Emergency Services Directors

1.6 NT Site Planning During the Interpandemic Period

The following activities should take place during the interpandemic period. Further detail is provided below the list.

- Review emergency preparedness legislation
- Identify triggers for implementation
- Plan for the triage process
- Assess locations for potential NT sites
- Planning for critical equipment and supplies

1.6.1 Review Emergency Preparedness Legislation

Emergency preparedness legislation makes many provisions for management of a crisis including: obtaining and accessing materials and other resources, implementation of crisis plans and a crisis management structure. Pandemic planning should be integrated with the emergency plans of the jurisdictions in order to make best use of existing plans and resources.

Important note: Regional pandemic plans should not assume that a national or provincial emergency will be “declared”, as this is unlikely to occur during a pandemic. Provincial and Territorial planners should assess issues such as workers compensation and liability insurance, maintaining and supporting workers and other aspects of the plan without, such a declaration.

The national support framework is not contingent upon declaration of a national emergency. The resource management and non-traditional sites working groups recommend all provincial and territorial planners review both federal and provincial/territorial emergency legislation to determine how to integrate plans within the framework of emergency legislation.

For example it is important to identify what provisions of legislation are particularly applicable to obtaining use of property and materials in a crisis. These provisions would include but likely not be limited to:

- the ability and responsibility of authorities to requisition property for use as NT sites,
- access to transportation, materials, administrative staff and other resources, and
- compensation for requisitioned property.

1.6.2 Identify Triggers for Implementation

Existing legislation and emergency plans at the government and institutional level already identify criteria that would trigger the implementation of specific plans. The Canadian Pandemic Influenza Plan and the pandemic phases will also describe general points of action.

In co-ordination with existing legislation and plans, provincial/territorial, regional and local authorities and institutions should identify key criteria and methodologies that would trigger the phased implementation of plans regarding NT sites in their jurisdiction. Local authorities, most likely the local medical officer of health, together with the local pandemic response team, will decide when to initiate the pandemic influenza plan for their jurisdiction, including recommendations regarding the establishment of NT sites.

Since it is likely that the pandemic will not start in Canada, the first trigger for the consideration of establishment of NT sites may be reports of the severity and epidemiology of the pandemic from other countries. This will likely be the first indicator of what to expect when the pandemic reaches Canada in terms of demand on traditional health care services.

In each locality it will be important for the local pandemic response team to be monitoring the availability of resources in their local acute care facilities and projections regarding when capacity may be exceeded (especially if there will be “free-standing sites”). Therefore potential triggers include:

- The proportion of emergency room visits attributable to influenza.
- The proportion of influenza cases requiring hospitalisation.
- The capacity of the hospital to accommodate influenza cases.
- The proportion of cases who normally live with high-risk individuals or who have no support at home and cannot care for themselves.

Other triggers may include reports from sentinel physician or walk-in clinics that they cannot accommodate all of the patients requesting appointments for influenza-like-illness (ILI). Ambulance re-routing to other acute care setting due to full emergency rooms may serve as another trigger

for further implementation of plans for NT sites. These triggers should be established during the interpandemic period.

1.6.3 Plan for the Triage Process

Definition of Triage:

A process whereby a group of casualties or patients is sorted according to the seriousness of their illness or injuries, so that treatment priorities can be allocated between them. In emergency situations it is designed to maximize the number of survivors.

In order to reduce demand on hospital emergency departments and potentially on family physicians and walk-in clinics, it may be necessary to perform triage at NT sites during the pandemic. The use of such a system will require a significant public awareness campaign since ill people will tend to seek services at their usual health care providers.

The Clinical Care Guidelines and Tools (Annex G) provide recommendations on the assessment and management of influenza and non-influenza patients during a pandemic, including algorithms on the triage of adults and children based on their clinical presentation and risk factors or co-morbidities. The guidelines on initial assessment and management assist healthcare staff, as well as volunteers with minimal expertise, to rapidly evaluate the needs of each individual and to sort patients efficiently in a crisis situation (i.e., to decide when patients can be treated as outpatients, or if they need to be redirected or admitted to a hospital). In larger communities, patients who required further assessment by a physician, X-rays and laboratory tests (secondary assessment) would likely be transferred to an acute care facility. Some NT triage centres, however, may have the facilities to perform secondary assessment and treatment without moving the patients.

Designation of NT sites as triage centres specifically for ILI has the added advantage of potentially reducing the exposure of other patients to influenza, consistent application of current recommendations through the use of patient care protocols and control over the number and type of other services, such as laboratory testing and chest x-rays, that are being ordered.

Non-traditional triage sites may be established at public health clinics/units, specifically identified walk-in clinics or triage centres adjacent to or associated with acute care institutions.

Triage sites will need to be organized to provide streamlined and efficient service. The following table is provided for planning purposes and suggest how a site might be organized.

Zone	Service	Training Required
Registration zone	Register in-coming patients	Trained non-medical workers
Waiting zone	Awaiting primary assessment	Medical professionals with trained non-medical workers
Primary assessment zone	Vital signs Chest auscultation & assessment	Trained non-medical Medical professional (physician or nurse)
Secondary assessment zone	On-site lab tests Secondary assessment	Trained non-medical workers Physician
Advanced first aid & transfer zone	Service to patients who arrive in distress includes oxygen, suction, etc. while they await transfer to emergency department	Advanced first aid
Education zone	Education resources and advice	Trained non-medical workers
Discharge zone	Follow up or transfer	

The Infection Control and Occupational Health Guidelines (Annex F) lists some guidelines for the set up of triage and preliminary treatment sites including:

- If possible, separate those with ILI and those without ILI by: minimizing time spent in waiting rooms; providing separate entrance/waiting areas for patients with ILI; placing patients with ILI directly into a single room; separate patients as quickly as possible by placing ILI patients in an area of the waiting room separated from non ILI patients by at least one metre.
- Remove magazines and toys from the waiting rooms.
- Clean equipment and environmental surfaces in examination/treatment rooms potentially contaminated by coughing patients as frequently as possible, preferably after each patient.

1.6.4 Assess Locations for Potential NT Sites

It is recommended that a multidisciplinary team approach be used to assess potential NT sites in a jurisdiction, to ensure suitability of a potential site. Ideally the assessment team should include:

- emergency personnel/police/fire,
- health care personnel, and
- engineering/maintenance/public works staff.

This team should conduct a community-wide space and site inventory to determine the location and availability of potential sites for NT hospitals and vacant land for possible mobile hospital installations. This assessment should be repeated at regular intervals during the interpandemic period to ensure that identified sites remain suitable. Potential locations for NT sites include, but are not limited to:

- schools
- hotels
- community halls
- banquet facilities
- arenas
- churches
- closed hospitals or hospital wards
- day care centres

For each location the feasibility of its use as a NT site should be determined based on the information below and the intended use of the facility.

Since a site at which inpatient care will be provided will have the most stringent and demanding requirements, it might be reasonable to assess each location for this type of service provision. Locations that are not found to be suitable for provision of inpatient care may be considered for another purpose such as triage or provision of education/counselling services.

Characteristics and Services Required for an Inpatient Care Setting

Each building under consideration should meet the National Building Code standards for its currently designated building type.

Once the building code standards have been assessed, the following issues need to be considered:

- Adequacy of external facilities:
 - public accessibility (including public transport, parking, directions) off-loading, traffic control, assistants for elderly, etc.

- Adequacy of internal space:
 - washrooms and sinks: number m/f; amenities, function
 - kitchen: refrigeration, dishes, dishwashing capability, food preparation areas etc.
 - secure space for administration/patient records
 - space for reception, waiting, patient care, patient/family education, counselling/support, and any other services defined by the planning process
 - secure storage capacity for pharmacy and other supplies
 - mortuary space
- Adequacy of critical support systems required for the site to provide patient care:
 - ventilation system (adequate air flow, air conditioning)
 - physical plant/ building engineering
 - electricity - power for lighting, sterilizers, refrigeration, food services.
 - natural gas supply – e.g., for heating or electricity or cooking
 - water supply
 - sanitation (including number of toilets, showers or washing facilities)
- Arrangements to provide essential support services required for the provision of in-patient care:
 - security
 - communications capability
 - maintenance
 - laundry
 - environmental/cleaning services
 - sterilization services – Sterilization of equipment should be provided by trained and experienced personnel using certified equipment. Appropriate arrangements for sterilization services, e.g., with a hospital, may be required
 - pharmaceutical services
 - medical waste disposal/storage
 - mortuary/funeral services
 - food services
 - facilities for staff lodging and feeding

Infection Control

When planning for a NT site it is important to establish whether the site will focus only on the care of influenza patients or whether other types of patients will be receiving services at these sites. Infection control issues will be greater if transmission of influenza to other patients is a possibility.

All patient beds should be separated by at least one metre; as is the norm for patients with any medical condition. If non-influenza patients will be seen at these sites separate waiting areas should be considered for potential influenza patients. For NT sites focussed on influenza, there appears to be no infection control basis for segregating people at various stages of illness. In either situation health care workers and visitors to the site will need to be educated regarding appropriate infection control practices.

Infection prevention and control issues are addressed in detail in Annex F of the Plan.

Security and Safety

The safety of buildings will be based on National Building Code and CSA standards. “Security” includes security of access, security of medications, and the security of patients. Security issues must be considered in choosing sites as well as when planning for staffing needs.

Upgrade Facilities

Some facilities may need to be upgraded, in order to be used as a medical site. Local authorities may wish to upgrade designated facilities in order to ensure they are adequate. Upgrades such as improving power supplies and upgrading washing facilities may be considered as an investment in emergency preparedness and part of overall emergency planning for the community.

As it is much less expensive to build in facilities at the time of construction than to add them later, emergency planners and pandemic co-coordinators may work with local authorities, school boards, etc. to add facilities to buildings that are under construction. .

1.6.5 Planning for Critical Equipment and Supplies

During the interpandemic period planners should identify critical equipment and supplies necessary for the establishment and operation of NT sites. Sources of supplies need to be identified; expected needs during an influenza pandemic and ability to meet those needs should be discussed with all possible suppliers. Potential access to the NESS should also be addressed.

A pandemic will likely result in shortages of medications, medical supplies and potentially operational supplies. Since multiple jurisdictions including other countries will potentially be affected by these shortages, the response plan should not rely heavily on outside assistance in terms of the provision of supplies and equipment. Some of the issues directly affecting Canadian supplies will be:

- *Interrupted transportation lines*—Canadian supplies travel long distances by truck train and aircraft. Supplies are often obtained from the U.S. and other nations. Difficulties at border crossings may substantially affect supply lines. In addition, a loss of up to 30% of workers, drivers, and other transportation staff may affect the production and delivery of supplies.
- *Lack of inventory* — In an effort to reduce costs, most health regions have moved to “just-in-time” inventory systems that keep minimal supplies on hand. Consideration should be given to the purchase of products made in Canada to avoid potential supply problems due to border crossing restrictions implemented at the time of the pandemic.
- *Embargoes* — The majority of medical supplies are not produced in Canada. Health Canada has made major efforts to establish a domestic infrastructure for the manufacturing of influenza vaccine and has encouraged in-Canada manufacture of some antibiotics. However in many cases supplies are provided by only one or two manufacturers worldwide or the essential ingredients or components come from a single source. In past pandemics and health crises other nations have banned the export of critical vaccines, medications and supplies.

Recommendations for the use of vaccine and antivirals during a limited supply situation are provided in other annexes.

Transportation and Supply Logistics

Transportation planning for NT sites should include consideration of the types of supplies and products (e.g., dangerous goods such as oxygen, biomedical waste, equipment for sterilization)

that will need to be transported to and from NT sites, who will provide these services (i.e., will volunteers need to be trained) and whether the site has appropriate delivery access. The size and types of vehicles and other mechanisms of transport have been identified for each “kit” that is available through the NESS.

Stockpiling

Provinces/territories and local health authorities may wish to review the possibility of rotating stockpiles of critical supplies for NT sites within their own jurisdictions. Jurisdictions may specifically wish to keep some older equipment such as beds, which need little maintenance and have no specific “shelf life”. Appropriate assessment should be made of the maintenance and training required to ensure the safety and effectiveness of older equipment, training needed by staff to use unfamiliar equipment, etc.

After such a critical assessment, institutions and health authorities may consider maintaining certain critical pieces of older equipment such as ventilators.

The stockpiling of antiviral drugs will be discussed at the national level, however, the need to and feasibility of stockpiling critical medications for the management of patients with influenza and secondary pneumonia, should be addressed at the P/T and local levels. In addition, provinces and territories will have to discuss with local pandemic planners the need to stock larger quantities of medications and equipment to manage persons with co-morbidities, e.g. chronic cardiac and respiratory disease, diabetes, renal failure, that may be exacerbated by influenza infection. The Clinical Care Guidelines (Annex G) provide guidance on antibiotics for the treatment of secondary pneumonia. The antibiotics currently stockpiled at the national level will be reviewed to determine whether these can be utilized in a pandemic, in addition to, further discussions on the need for additional national stockpiles.

Equipment and Supplies

The issue of equipment and supplies has been addressed in other annexes. The Resource Management annex provides information on supplies and equipment issues for acute care facilities that can be extrapolated to identify needs for NT sites. In addition, the treatment protocols in the Clinical Care Guidelines (Annex G) can be used to plan for medical supply and equipment needs. The Infection Control annex will address the use of masks and gowns and other supplies in various settings.

The services offered by each NT site will obviously dictate equipment and supply needs. For example, it is unlikely that NT Sites will be able to provide the expertise and resources required to support intubated patients, however, equipment may be needed to support patients requiring ventilation while they are transported to another facility. Isolated communities may wish to review the possibilities for hand ventilators (Ambubags) for short-term assistance and other equipment that does not require the same expertise or support as for ventilated patients.

The following is a preliminary list of medical equipment and supplies needed to provide medical care in each site.

- beds, bedding
- lights
- intravenous equipment (e.g., needles, intravenous catheters, fluid and tubing, syringes, tape, tourniquet)
- sterilizers
- sphygmomanometer, stethoscopes, thermometers

- miscellaneous supplies (e.g., antiseptics, dressings, bandages, steristrips, gloves, alcohol based hand sanitizers, alcohol sponges, gauze sponges, arm boards, pulse oximeter, extra batteries for equipment needs, flashlights, scissors, tongue blades, portable lamps)
- emergency drugs (e.g., epinephrine, diazepam, salbutamol)
- airway supplies (e.g., bag-valve-mask, oxygen masks, oxygen tubing, oxygen tank, spacer device for aerosolized medication, motor-driven nebulizers, oral airways, suction machines and catheters)
- patient identification tools
- privacy screens
- communications (telephone, fax, cell, radio or alternatives for isolated communities)
- computers and Internet access

Supplies will need to be carefully managed. An example of a supply management form is provided in Appendix A.

Local Production

During a crisis some items, which are usually ordered from centralized sources, may be produced locally. Procurement specialists may wish to review which supplies could be obtained or produced locally if prior arrangements are made. Possible suppliers and suppliers of alternative products should be contacted to explore this possibility.

1.7 NT Site Planning During the Pandemic Period

The following activities, with respect to NT sites, should occur during the pandemic, when there are indications that NT sites will be needed, based on local resource availability and utilization, and projections of disease impact:

- Re-evaluate plans based on WHO and Health Canada epidemiological projections.
- Appoint site administrators/managers or teams
- Implement plans to prepare the site(s)
- Co-ordinate procurement of supplies

1.7.1 Re-evaluate Plans Based on WHO and Health Canada Epidemiological Projections

Based on expected attack rates and the demographic of the groups most affected, local planners may re-evaluate what sites and services may be required. For example, if it appears pregnant women will be seriously affected by influenza as they were in 1918, moving deliveries to birthing centres may not be appropriate.

1.7.2 Appoint Site Administrators/Managers or Teams

Each NT site will require a site administrator/manager or a team of managers to locate the site, set up, manage adaptations, schedule staff, oversee movement of supplies, maintenance etc. and continue to operate the site. Depending on the size of the NT site, what services are offered and the community, this may require on-site management 24 hours a day 7 days a week for the duration of the epidemic wave. The nature of the task and the fact that any one may fall ill or be incapacitated requires that all such managers should have alternative people to whom to delegate authority.

1.7.3 Implement Plans to Prepare the Site(s)

The Centre for Emergency Response and Preparedness (CEPR), Health Canada, has developed outlines for the planning and operation of Emergency Reception Centres and Shelters available through CEPR or the Provincial/Territorial Emergency Services Directors.

- Contact those currently responsible for the site (school board, civic authorities for community centres, etc.)
- Conduct a “walk through” of the site to determine any problems or needed emergency upgrades.
- Ensure heat/light/power/water/telephone is operational.
- Ensure adequate furniture and position.
- Remove any obstructions, tripping hazards, impediments to flow, etc.
- Affix or erect any necessary directional signs, including route to washrooms if unclear.
- Identify various rooms/areas for specific functions (e.g., rest, food service, etc.)
- Ensure adequate hand hygiene stations are available.
- Document and report any:
 - deficiencies in facilities;
 - failure of heat/light/power/water/telephones.
- Arrange to move out and store any equipment that will not be needed (e.g. desks, chairs).
- Clean and disinfect the site.
- Contact any required transportation providers.
- Notify pre-determined media for public direction.
- Determine staff support - electrician/plumber/public health inspector/public health nurse/occupational health and safety personnel.
- Determine municipal support.
- Address financial implications to municipality. Ideally, using previously established accounts.
- Notify garbage removal contractor if required.
- Notify recycling removal contractor if size or duration indicates.
- Notify staff, volunteer agencies, and specialty personnel (see Human Resource Section).

1.7.4 Coordinate Procurement of Supplies

- Contact stationery, office, and support equipment providers; arrange transportation if required.
- Contact identified food suppliers (may be a pre-alert to provide lead time).
- Notify any required food transporters (vehicles).
- Arrange for dishes/eating utensils if not present at identified food serving locations.
- Order additional medical supplies.
- Establish alternate transportation/distribution arrangements if required.
- Establish local production of supplies where possible.
- Evaluate the need to access supplies from the NESS and request if necessary.

1.8 NT Site Planning During the Post-Pandemic Period

The possibility of subsequent waves of the pandemic, and the resources that would be required during those waves, should be considered before decommissioning NT sites.

Activities at NT sites during the post-pandemic period will focus on the discharging or re-locating of patients, storage of medical records and the decommissioning of the NT site(s). Each site should be assessed for damage or necessary alterations to return it to its previous use. Supplies should be redistributed, stored or returned to stockpiles. Insurers will also need to be notified of the date the site was decommissioned in order to discontinue the coverage.

Section 2: Human Resources Issues

2.1 Introduction

During an influenza pandemic there will be an increased need for people with health care training to deal with the increased demands on the health care system. This may involve the re-locating of health care workers to different settings, including NT sites or to different locations within the same traditional site to provide services that differ from their usual responsibilities. In addition, non-health care workers may need to be hired/contracted to provide supplementary services essential to the establishment and operation of NT sites or the expanded role of current health care sites. Volunteers will also be a potentially vital source of human resources to facilitate the management of health care services during a pandemic.

During an influenza pandemic the shortage of trained medical staff will be one of many barriers to the provision of adequate care. A significant proportion of the workforce may be unable to attend work for a period of time due to illness in themselves or family members. Communities and health care organizations will need to have specific guidelines in place to address what will be done if the health care system is overwhelmed and NT sites must be established or current service sites expanded. Human resource management in the acute care setting during a pandemic is addressed in the Resource Management Guidelines for Health Care Facilities During an Influenza Pandemic, Annex H of the Plan. This section of the document will, therefore, focus on human resource issues outside of the traditional acute care settings.

2.2 Human Resource Planning During the Interpandemic Period

Planning during the interpandemic period for the optimal use of human resources at NT sites and other health care sites involves several steps. The following list of steps/activities is provided to assist with this part of the planning process, details are provided in the following sections.

- Appoint a human resource management team.
- Identification of human resource needs and a database to be used for staff and scheduling.
- Review emergency preparedness legislation.
- Recruitment of health care professionals.
- Plan for salaries or payments to staff not currently employed by the health care system.
- Identify and recruit volunteers.
- Provide training.
- Establish immunization recommendations.
- Supporting health care workers in NT sites.
- Insurance/licensing.

2.2.1 Appoint a Human Resource Management Team

The work involved in identifying current health care workers who could be re-located to NT sites; recruiting additional health care workers, non-medical workers and volunteers; and managing the training, assignment and support of these workers, should be initiated during the interpandemic period.

Establishment of a team or subcommittee that could take on these responsibilities in each jurisdiction is an important first step. A combination of professionals with expertise in human resource issues, pandemic planning, health care administration, and volunteer organizations would be desirable for this planning team/subcommittee.

2.2.2 Identify Human Resource Needs

One approach to identifying the human resource needs for NT and other health care sites is to consider each potential type of site and the services that would be provided at each. From this exercise the number and type of health care workers and non-health care workers that would be required per site could be estimated.

The following is a list of where additional or new human resources will be needed during a pandemic (excluding acute care facilities).

- Triage Sites – community triage sites: at clinics, non-traditional sites, attached to an existing hospital
- Non-Traditional Sites – including emergency care centres, emergency hospitals, support hotels, nursing stations, etc.
- Vaccination Clinics – mobile clinics, clinics in acute care sites, etc.
- Home Care/Community Care – to reduce the pressure on other health care programs
- Long Term Care Facilities
- Telephone Information Services, 24-hour health lines
- Other – doctors' offices, specialty health services (cancer or cardiac treatment centres), etc.

In order to make best use of the skills of various health care workers a pandemic will likely require that health care workers be reallocated from their usual roles and settings. For example, trained, health care professionals, will be required to supervise volunteers and other staff in clinics and non-traditional sites.

Shortages of physicians and nurses will require extensive use of other health care professionals, trained non-medical workers and trained volunteers. Each jurisdiction needs to conduct an inventory of health care personnel and potential volunteers and determine sources from which additional staff could be acquired, assuming that hospitals are using much, if not all, available staff for their own needs. The following list is for reference, and may be adapted and altered to meet various needs.

Health Care Workers (HCWs)

Within facilities, consideration should be given to reassigning medical and nursing personnel with administrative, research and educational assignments to clinical duties.

Alternate sources of HCWs would include, but are not limited to:

- retired physicians/nurses (need to be assurance that work during a pandemic would not affect their pension plans)
- physicians/nurses currently not working in clinical health care (i.e., working in education, administration, research, private industry)
- medical and nursing students
- registered nursing assistants
- patient care assistants
- emergency medical technicians

- veterinarians
- pharmacists
- therapists (respiratory/occupational/physio)
- technicians (laboratory, radiography)
- pharmacists, therapists, technicians in training
- health care aides

Personal Care Services

Personal care services involve those people that provide health care and support services in the home. It is recognized that these organizations already function near capacity and may have limited ability to expand during a pandemic. These services include, but are not limited to:

- VON
- Home Health Agencies

Categories of Workers

In a pandemic, in addition to current health care workers, health care tasks may have to be undertaken by personnel who would not normally perform these tasks. For the purposes of assigning tasks, training, support, insurance and other issues human resource planners and managers must be aware of the following types of workers:

- paid health care professionals
- paid health care workers who are not licensed professionals
- paid non-health care/non-medical staff (support, maintenance, etc.)
- volunteer health care professionals
- volunteers trained in medical tasks, but who are not licensed professionals.
- volunteers not trained in medical tasks, but can provide other essential services to health care sites– e.g. electricians, who help set up the NT site.

For each site the essential functions and the skills required to complete each task should be identified and documented. It will be necessary to establish medical and nursing directives for each NT site (triage, influenza hospital, nursing station, community clinic or support hotel) and to access existing directives for sites that may need to be expanded during a pandemic.

The next step is to list the type of workers/volunteers who already have the skills to carry out these tasks. (In existing institutions these roles are already defined, however they will need to be developed and adapted for use in the non-traditional sites.) Any gaps in required skill sets should be addressed during this planning exercise. It may be necessary to investigate the local availability and access to other types of service providers in this type of emergency situation (e.g., mortuary services).

Checklist of Functions and Personnel at Non-Traditional Sites

This is a checklist of functions that may be required at a non-traditional site. It is an example of how the exercise described above might be documented. Depending on size, number of patients and function of the site, many tasks may be carried out by the same individual. Consider that these functions may be required 24 /7. Some services may be provided by a central hospital or community.

FUNCTIONS	SKILL SETS/PERSONNEL
A. Administration	
Site administration/management	Management/administration
Co-ordination of patient care – staff scheduling and support, assessing service demands and supply	Medical training/knowledge (e.g. in-charge nurse), leadership and coordination skills
Medical management	Physician or nurse with physician backup
On-site training and orientation of staff, volunteer and family members	Knowledge of basic patient care, patient triage, infection control, occupational health and safety
Spokesperson	Medical management. If no medical spokesperson refer to hospital or site administrator
Receptionist	Communication/language skills, public relations
Health records management	Clerical skills (including computer skills), confidentiality agreement
Information technology resource	Knowledge of IT systems and problem solving skills
B. Patient Care	
Medical triage	Medical training/nurse, ideally with ER training
Admissions/discharge	Medical training/nurse, ideally with experience in discharge planning
Patient care - medical	Instructed in nursing care: rehydration, feeding, ambulation, bathing, vital signs monitor, give meds
Physiotherapy	Trained in chest phyiotherapy and mobilization
Respiratory care	Trained in oxygen delivery, patient monitoring, equipment monitoring (oximeters) and inventory
Pharmacy services	Pharmacist at hospital or in community
Discharge planning	(Refer to community care, self care)
C. Infection Control	
Sterilization of equipment	Trained in sterilization and infection control
Housekeeping	Basic infection control knowledge
D. Food Services	
	Hospital or community based?
Patient nutrition/therapeutic diets	Dietician at hospital or in community (home care, meals on wheels)
Food preparation - workers' meals	Basic food safety training
E. Social Services	
Social service/community care	Counselling, accessing community resources/ Liaison Social Worker
Psychology/pastoral care/grief counselling	Social workers, religious leaders, psychologists, local service clubs/support groups
Care for children/family members of workers	Training or experience in child care, care for elderly, home care/criminal records check
F. Morgue	
Transportation of corpses	Driver's license
Preparation and storage of corpses (see Annex on Mass Fatalities)	Body bagging, shelving corpses

FUNCTIONS	SKILL SETS/PERSONNEL
G. Transportation	
Patients, staff	Class 4 license
Dangerous goods (e.g. oxygen), medical waste	Appropriate licenses and liability insurance
Supplies, lab tests	Drivers license, criminal records check
H. Services	
Laboratory testing	Laboratory services at hospital or in community
Maintenance	plumbing, electrical, etc.
Laundry	local laundry business
Communication services and equipment support – phone, cells, cable, computer support	Local businesses
I. Security (Staff ID will be necessary)	
Public order and personal safety	Crowd control, traffic control
Protection of site – fire safety, theft	Trained in building safety and security

Training for health care workers, volunteers, family members may be carried out at the time of a pandemic.

2.2.3 Review Emergency Legislation

Emergency legislation makes many provisions for the management of workers during a crisis. This includes the recruitment of professional and other paid staff as well as volunteers, managing human resources and protection of people who volunteer. Pandemic planning should be integrated with the emergency plans of the jurisdictions as much as possible, in order to make best use of existing plans and resources. Remember, it is unlikely that an Emergency will be “declared”. Therefore human resource planning should be based on existing plans without a declaration.

The following provisions of legislation are particularly applicable to human resource issues including:

- authority regarding licensing and scope of practice issues, and the ability of government to make unilateral changes during a crisis;
- safety and protection of workers, (one of the primary responsibilities);
- fair compensation;
- insurance, both site insurance, workers compensation and other forms of insurance;
- training;
- provision of clothing and equipment;
- protection of the jobs of workers who take leave to assist during the crisis.

Compelling Workers

Under emergency legislation provinces/territories may have the authority to designate “Essential Services” and workers and have the ability to compel people’s time or property with due compensation as a last resort.

This issue has been raised both because of the existing shortage of health care workers and concerns that health care workers and others may refuse to work during a pandemic due to changed job responsibilities, fear of infection, family responsibilities or other reasons. However, the extreme difficulty of enacting or enforcing such legislation has been noted and jurisdictions

are strongly encouraged to review all other methods of obtaining essential human resources, in advance of a pandemic.

2.2.4 Recruitment of Health Care Professionals

While actual recruitment of health care professionals for the purpose of service provision will not be necessary until the pandemic arrives, it is important to establish an ongoing dialogue with these professionals in the interpandemic period. Communication must take place to inform health care professionals about influenza, influenza pandemic plans and their roles within those plans. It will be important to convey the potential impact of the pandemic on health care service provision and specifically the need for additional human resource and NT sites. Issues regarding licensing and scope of practice expansion during a crisis should be discussed with the goal of addressing any concerns during the interpandemic period rather than at the time of the pandemic. In addition, any potential impediments for recruited/volunteer health worker being able to return to their own workplace following the provision of services in the NT site, will need to be addressed in advance. Education regarding the identification and treatment of influenza and immunization programs should also be ongoing during the interpandemic period.

In order to be able to call on health care professionals, for the purpose of pandemic training or the implementation of the pandemic response, planners should review the logistical and legal issues around developing databases of HCWs who have the training and skills needed during a pandemic. This may be achieved by arranging with the appropriate licensing bodies or associations for the establishment and maintenance of databases of members for use during a crisis. There may be legal requirements that individuals agree to keep their names on a list of professionals available for work in a crisis.

2.2.5 Plan for Salaries or Payments to Staff Not Currently Employed by the Health Care System

Decisions around payment and expenditures will be based on current arrangements and labour agreements in each province, territory or local jurisdictions. Planning must be based on these contractual arrangements or assessment of current local salaries for similar work.

2.2.6 Identify and Recruit Volunteers

Definition of Pandemic Volunteer

The following is a definition of a volunteer for the purposes of pandemic planning and response.

A volunteer is a person registered with a government agency or government designated agency, who carries out unpaid activities, occasionally or regularly, to help support Canada to prepare for and respond to an influenza pandemic. A volunteer is one who offers his/her service of his/her own free will, without promise of financial gain, and without economic or political pressure or coercion.

A volunteer may be a health care or other professional, or any other person who offers their services freely. Notwithstanding that while a volunteer may not expect financial gain, or remuneration for their time, the agency or government may provide supports such as: insurance protection, family support and job security to facilitate the recruitment of needed volunteers.

Interpandemic Tasks in Volunteer Management

There are several tasks/activities that should take place during the interpandemic period to optimise the use of volunteers in the pandemic response. These include:

- a. Communicate with the public and with volunteer organizations.
- b. Develop and maintain databases of volunteer organizations.
- c. Develop Job descriptions and skill lists for volunteer positions in conjunction with volunteer agencies. (See Checklist of Functions and Personnel)
- d. Develop recruitment, screening procedures.
- e. Develop training procedures.
- f. Monitor and track qualifications.
- g. Prepare to manage volunteers.

The time between the WHO declaration of an influenza pandemic, the first wave and analysis of the severity of the pandemic will be very short. There will be a need to recruit, screen, train and deploy volunteers as quickly as possible. Therefore procedures need to be in place in order to best place volunteers in as short a time as possible.

a. Communicate with volunteer agencies

Existing volunteer agencies will be the primary source of trained, screened volunteers in most jurisdictions. Developing ongoing communications and planning procedures with these agencies will be essential to the planning effort.

Potential sources of volunteers include, but are not limited to:

- Red Cross
- St. John Ambulance
- Salvation Army
- Volunteer Fire Departments
- Mennonite Disaster Services
- Adventist Disaster Relief Association (ADRA)
- Scouts, Sea/Army/Air Cadets, Guides
- Big Brothers
- Big Sisters
- Community Service Agencies
- Christian Reformed World Relief Committee - Disaster Response Services

Each jurisdiction needs to liaise with non-governmental organizations within their district to determine the approximate number of volunteers who would be available during a pandemic.

During the interpandemic period, recruitment of volunteers, both those with health care skills and those without should take place primarily through existing agencies. These agencies already have recruitment, screening, training programs and management programs in place. It is important that health authorities and emergency planners establish communication with existing agencies to communicate community needs during a pandemic, in order that agencies may recruit and maintain a core group of volunteers with appropriate training. They may wish to add certain types of training to standard training programs in order to address issues regarding pandemic influenza. Specifically, volunteers should be aware that unlike other emergencies such as earthquakes or floods, the duration of the “emergency” will be longer for an influenza pandemic and more than one pandemic wave will likely occur. Since people view

the risk of disease differently than the risk of injury, and will be concerned about bringing this disease home to their families, it is important that these issues are addressed during training sessions.

b. Develop and maintain databases of volunteers

Because maintaining up-to-date databases of volunteers is time consuming, difficult and expensive, health authorities will likely have to depend on existing volunteer agencies. Such agencies should be encouraged, where possible, to track trained and screened (those that had interviews, reference checks and criminal records checks) volunteers and track records of certificates or diplomas and maintain methods of communication. Health authorities may wish to encourage these agencies to keep their databases current, and to expand the information on their volunteers' skill sets or experiences, to include skill sets that would be required in a pandemic.

c. Develop job descriptions and skill lists for volunteers

Develop a list of jobs, job descriptions and skills based on the needs of the region or community and working in conjunction with volunteer agencies. (See Checklist of Functions and Personnel). This list can be used to determine which training programs are necessary and how best to recruit, train and assign volunteers in the interpandemic and pandemic periods.

d. Develop volunteer recruitment, and screening procedures

Develop procedures that can be implemented quickly once a pandemic is declared. (See Pandemic Period – Recruitment, Screening and Deployment.)

e. Monitor and track qualifications and certification

Plan for methods to ensure health care workers, including volunteers are trained and certified for the tasks they are undertaking.

- Review the logistical and legal issues around developing databases of HCW's who have the training and skills to be deployed during a pandemic.
- Arrange with appropriate agencies to maintain databases of members for use during a crisis. There may be legal requirements that individuals agree to keep their names on a list of those available for work in a crisis.
- Plan for a "Quick Check" method of confirming certification or qualification.
- If a volunteer is trained at an NT site during a pandemic, plan for ways to test and record the level of skills.

f. Prepare to manage volunteers

During a major crisis many people come forward who wish to volunteer. In some cases managing the numbers of people who come forward to volunteer is a major logistical effort in itself.

During the interpandemic period:

- Review emergency plans for managing an influx of volunteers.
- Plan for a volunteer co-ordinator or team – identify agencies, positions or individuals – to take responsibility for directing the process of accepting, screening, training and placing volunteers.
- Ensure resource information is available to the volunteer co-coordinator/team.
- Plan for a location for volunteer recruitment/management that is separate from existing hospitals or clinics to reduce congestion and security issues.

2.2.7 Provide Training

Both health care professionals and other workers will need training for dealing with pandemic influenza. Professionals may need training or refresher courses in tasks they don't normally perform, including supervision and management. Due to the limited number of health care professionals that will be available in the community, volunteers and other non-medically trained staff will likely be needed to perform direct patient care.

i) Train the Trainer

Health authorities and existing volunteer agencies, may establish programs to “train the trainers,” to maintain resources to call on during a pandemic. Plan for where and how training programs will be delivered, ideally during the interpandemic period, but also during the pandemic.

ii) Train for Self-Care

All health care workers should be trained in self-care as it pertains to pandemic influenza treatment and symptom control and the ability to communicate the principles of self-care to others. As professionals will likely be required for the provision of medical services, teaching self-care skills may become part of the volunteers' role.

A number of jurisdictions are currently developing “Self-Care” modules designed to improve the quality of home care. (See the Clinical Care annex for more information). Jurisdictions are encouraged to share such resources and to develop other health information services for the public, e.g. 24-hour telephone health information services. Ensure that all those training in self-care are using consistent, accurate and up-to-date information.

Plan for methods to educate health care workers and the public in Self-Care. While some education will be done in advance, much of the education of patients and their families will take place in clinics, NT Sites, vaccination clinics during a pandemic.

iii) Train Health Care Professionals

A number of training programs exist which can be adapted for pandemic influenza. Health care professionals may need training for reassignment and training for supervision.

The time for training once a pandemic is underway will be extremely short; therefore training should be incorporated into existing programs now. By incorporating the skills needed during a pandemic into existing training, we reduce costs, improve efficiency and enhance readiness.

Training may include medical training essential to working in a pandemic situation including:

- Infection control procedures
- Use of respirators and care of patients on respirators
- Worker and volunteer supervision
- Working with grieving families

Develop a plan for training/retraining health care workers who have not been working in health care (retirees, etc.) at the time of a pandemic. (See Resource Management Guidelines in Acute Care Settings [Annex H] for lists of Health Care Professionals.)

iv) Train Volunteers

During the interpandemic period, volunteer training may be left as much as possible to existing agencies. In areas without well-developed volunteer systems and agencies, planners may wish to review the need for developing, maintaining and funding core groups of volunteers trained for medical emergencies such as pandemic, and trained trainers.

All volunteers should be trained for

- Self-care and
- Infection prevention and control (routine or universal precautions).

Based on the Checklist of Functions for your jurisdiction, volunteers working in direct patient care may also be trained in:

- Basic personal care (bed baths, bed pans)
- Observation of condition (temp, pulse, resp, etc.)
- Case definition, identify the illness
- Giving medications (pills, eye and ear drops, liquids)
- Oxygen administration
- Pressure ulcer prevention – skin care
- Ambulation, mobilization

Volunteers will also be needed who are trained in the following:

- Cleaning in health care facilities
- Records management
- Food preparation (food safety courses)
- Workplace Hazardous Materials Information Systems (WHMIS) protocols
- Security staff trained in working with grief stricken people.

Review the Checklist of Functions for the training required in your jurisdiction. As far as possible, existing agencies should be encouraged to maintain skills in these tasks during the inter-pandemic period.

v) Training Resources and Programs

Curricula for the above listed skills are available through existing agencies.

Training programs include, but are not limited to:

- on-line courses, including an Infection Prevention on-line course for infection control issues at www.igc.org/avsc/ip/index.html
- Association for Practitioners in Infection Control and Epidemiology training manual “Influenza Prevention: A Community and Healthcare Worker Education Program” < <http://www.apic.org/resc/>>
- St. John Ambulance Brigade. Brigade Training System. 1997
- St. John Ambulance Brigade. Handbook on the Administration of Oxygen. 1993. ISBN 0-919434-77-0
- The Canadian Red Cross Society. Yes You Can Prevent Disease Transmission. 1998
- Nursing colleges training programs (i.e. the basic care programs for health care aides)
- CHICA, APIC and the Infection Control Association in the UK have a “tool kit” with detailed forms and templates that could be used at the NT site, 2002. [reference: “Infection Control Toolkit” - Strategies for Pandemics and Disasters, can be ordered through the Community and Hospital Infection Control Association (CHICA-Canada), Phone: 204-897-5990 or toll free 866-999-7111; Email : chicacda@mb.sympatico.ca]

2.2.8 Establish Immunization Recommendations

While no vaccine for the pandemic strain of influenza will likely be available in advance of the arrival of the pandemic in Canada, health care workers should be up-to-date with the other recommended immunizations. Because immunizations require varying amounts of time and some require more than one dose for a person to develop immunity, it will likely be impossible to

provide all of these once a pandemic is declared, or to provide them within an appropriate time frame given the lack of supplies and human resources.

Where possible volunteers already working with existing agencies or recruited in the interpandemic period should be encouraged or required to be up-to-date with respect to the recommended immunization schedule. In addition, depending on type of work they will be doing during the pandemic, it may be appropriate to recommend that volunteers receive the same immunizations that are recommended for health care workers (e.g., hepatitis B vaccine). Volunteer recruiters should also ask for immunization records, where possible, to facilitate identification of individuals who are not up-to-date with respect to the current recommended schedule.

2.2.9 Supporting Workers in NT Sites

Plans to extend support programs for health care workers (including trainees, volunteers and retirees) to all workers at NT sites should also be included in overall plan for the management of human resources. Support should include: provision of food and drink, grief counseling, support for families and job protection.

2.2.10 Insurance/Licensing

In addition to addressing any liability / insurance issues in relation to health care professionals and other non-professional health care workers, these issues must also be addressed for retired/trainee health care professionals and volunteers performing patient care and other non-medical tasks.

There are a number of insurance issues which present major concerns, especially the insurance required for workers at NT sites including volunteers. The Non-Traditional Sites and Workers subgroup has noted that issues around personal liability and workers compensation (including compensation for acquired illness) may present a powerful barrier and disincentive to the recruitment of health care workers, especially volunteers, during a crisis. A recommendation has been put forth, that these issues be addressed on a national basis, and be reviewed by provincial/territorial planners to determine the legislative, administrative, licensing and other options within each province and territory.

The scale of a pandemic may require significant changes to scopes of practice of professionals, and delegation of tasks to non-professional staff and volunteers. These raise many issues regarding insurance and licensing which must be reviewed with respect to existing insurance, licensing practices, cross jurisdictional licensing, labour agreements and Emergency Legislation. The types of insurance which must be reviewed include:

- Malpractice and personal liability
- Transfer of licensing between jurisdictions
- Workers compensation
- Accidental death and dismemberment.
- Directors and officers liability (depending on the administrative authority)

Malpractice/Liability Insurance of Workers and Volunteers

Review liability protection/malpractice insurance coverage to see how it will extend to cover workers in Non-Traditional Sites, professionals, those taking on tasks not usually part of their scope of practice and volunteers.

Transfer of Licensing Between Jurisdictions

Each province/territory must review with its professional licensing bodies (medical colleges, nurses associations) how pandemic workers with varying qualifications, or licensed in other jurisdictions, may deliver some services. Professional licensing bodies may be asked to liaise and extend privileges to out of province professionals, or foreign trained professionals based on their standing in another jurisdiction.

Workers' Compensation

Each province/territory must make appropriate arrangements with their workers' compensation board if pandemic volunteers are to be covered by workers' compensation. A Memorandum of Understanding (MOU) between the Office of Critical Infrastructure Protection and Emergency Preparedness (OCIEPEP) Canada and the provinces/territories asserts that registered volunteers or persons compelled for emergency service work are protected by workers' compensation during emergency response, as long as they are registered. Some volunteer agencies have a liability policy for their volunteers. In some circumstances, volunteers who register with designated agencies may be covered by workers' compensation under Emergency Preparedness Legislation. However, there are a number of issues to be resolved with workers' compensation Boards at the provincial level:

- Definition of Health Care Workers for this purpose
- Definition of volunteers for this purpose
- Does the policy require a declaration of Emergency and at what level of government or would the insurance come into effect once the Minister of Health declares a pandemic?
- Compensation is usually based on loss of income, however, in some cases volunteers may be retired, homemakers, or self-employed. Would compensation cover costs of the person's other responsibilities, such as family care?
- Would compensation be available if volunteers became ill rather than injured?

Accidental Death and Dismemberment

Usually a subset of workers' compensation. Ensure that this insurance is available.

Directors and Officers liability

If the health care site or service is a part of an existing institution, hospital, or health authority, determine whether existing insurance can be extended to those managing sites or services elsewhere or obtain this insurance elsewhere.

2.3 Human Resource Planning During the Pandemic Period

Once a pandemic is declared there will be a massive effort required to implement the programs and activities developed during the interpandemic period to manage the human resource issues. Activities will include:

- Activation of the Human Resource Management Team
- Implement Volunteer Management Team
- Provide Human Resource Management Team with lists and job descriptions of personnel required.
- Contact supporting organizations to request additional personnel with special skills, e.g. translation services, churches/counselling services.

2.3.1 Contact Health Care Professionals

By the time a pandemic is declared most existing health care institutions and agencies will be aware that the WHO and Health Canada have been monitoring a growing situation. Communications with professionals is vital at this stage as professionals will be required to take on additional or changed responsibilities and may be reassigned to other sites or activities.

2.3.2 Volunteer Recruiting, Screening, Training, Deployment

a. Communicate with volunteer agencies

Communicating with the volunteer agencies to co-ordinate the activities of voluntary efforts will be one of the first tasks of the Volunteer Management Team.

b. Call for volunteers

In emergencies often volunteers come forward. This potentially large and commendable response needs to be channelled so that those with needed skills can be placed where they are needed most and their skills can be optimized. However, not all volunteers will have the skills, ability or stability required for the jobs they want to do. Therefore, any calls for volunteers should identify the needed skill sets to streamline the recruitment process.

Volunteer recruitment and screening needs to be considered, including:

- position descriptions
- advertising the need for volunteers
- screening criteria
- volunteer application forms
- interview
- reference checks
- criminal record check.

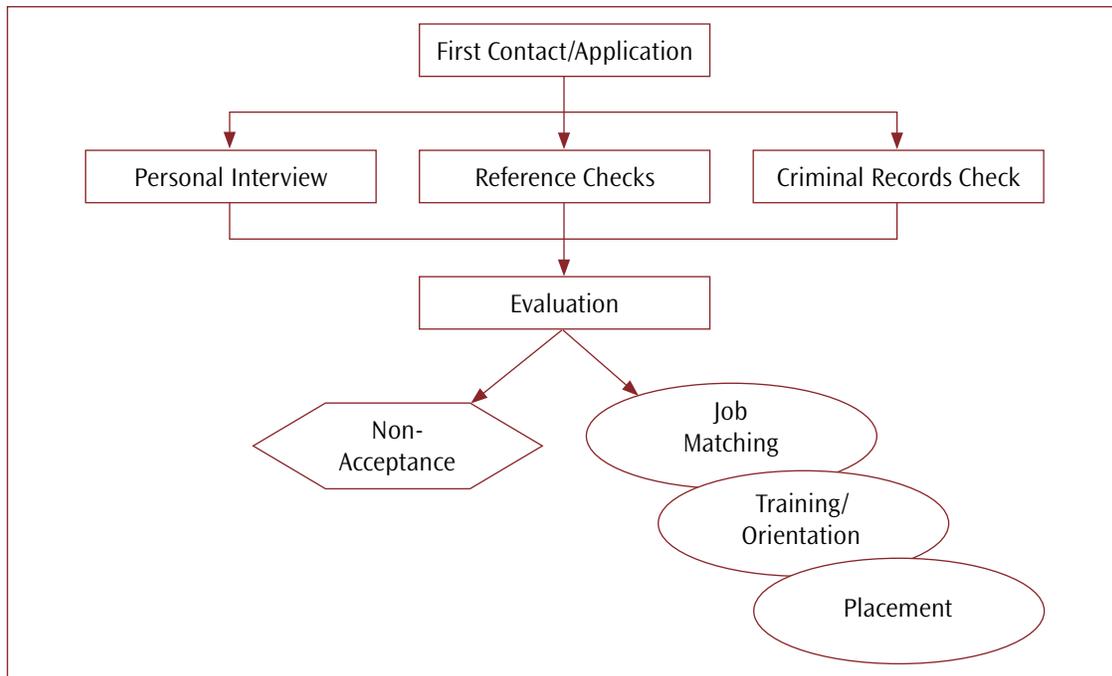
Useful resources include, but are not limited to:

- The Canadian Red Cross Society. National Volunteer Policy Manual
- The Canadian Red Cross Society. The 30-Minute Quick-Response Guide. 1995.
- The Canadian Red Cross Society. Disaster Response Team: Participant Attachments. 1996.
- St. John Ambulance Brigade. Screening Brigade Volunteers. 2000.

c. Volunteer screening

Volunteers in a pandemic may be placed in positions of significant trust and authority, with vulnerable people. Volunteer positions will vary in nature, in the type of training, skills and abilities required, in the setting and in the level of risk to the volunteer. Volunteer screening must take all of these issues into consideration and provide for interviews, review of qualifications and appropriate assignment. In addition, it is important to ensure that volunteers do not have a personal history, which indicates they are incompatible with the safety and well being of vulnerable people.

Screening processes must review the stability of the individuals and may include criminal record checks. Information on procedures used by the Red Cross, and St. John Ambulance is available through their offices.



The most important part of volunteer recruitment and assignment is the interview process. Reference checks are also a good screening tool. A criminal records check is usually required by law for volunteers who work with vulnerable people. However, during the pandemic, police services may not have the resources due to illness and/or have other high priority duties to provide this service. Therefore more emphasis may need to be placed on conducting a good interview and reference check process. It will be important to use trained volunteer recruiters, preferably identified and trained during the interpandemic period.

- Check existing emergency plans, regional or municipal plans for information on recruiting and screening volunteers
- Partner with existing agencies, where possible.
- Review Red Cross, St. John Ambulance and other resource documents

Due Diligence: The volunteer recruitment process should include a briefing meeting on risks and infection control (routine or universal precautions), and should require the individual to sign an agreement acknowledging they have been informed of the risks and protections, prior to being assigned to a placement.

2.3.3 Training During the Pandemic

Training programs developed or planned during the interpandemic period should be “geared up”. These will include those programs listed in the interpandemic section of this document.

Training for Families/Caregivers

Family members of patients may stay at the site to help care for a patient or may be asked to take a patient home. In either case, the family member will need some training, especially in the areas of re-hydration, infection control, observation and assessment, and self-care. In addition, families may require counselling to help them support those who are ill or to cope with fear and grief.

Training for Support Tasks

In addition to training for patient care there are needs for training for intake, housekeeping, maintenance and other tasks. There are standards set for training of all workers related to health care, including housekeeping and maintenance staff. In many cases staff associations set these standards.

It is important to note that during a crisis it will not be possible to demand the same level of training for volunteers, which would normally be required of staff. Thus, it will be important to consider what are the minimum standards and basic information that must be communicated on certain issues.

2.3.4 Supporting Workers in NT Sites

Support provided to Workers at Non-Traditional Sites may include:

- Emotional support/grief counselling (aimed at permitting workers to continue to work and reduce loss of staff due to grief or traumatic stress).
- Family care (for children, seniors, sick family members who do not require hospitalization). This poses some questions around infection control if gathering children or others together for group care.
- Job protection for workers who move from other jobs during pandemic.
- Job protection for spouses who do family care to allow workers to work in health care.

2.3.5 Communicate Changes to Licensing and Insurance Provisions

Inform site managers and coordinators, as well as health care professionals in all sites and health care programs of changes in licensing and insurance and what it will mean for flexibility in staff deployment and additional staffing.

2.4 Human Resource Planning During the Post-Pandemic Period

Activities during this period will focus on the demobilization of staff and volunteers. Assessment of insurance claims or claims for assistance will also occur during this period.

Canadian Pandemic Influenza Plan for the Health Sector: Communications Annex

Date of Latest Version: October 2006

Summary of Significant Changes:

- Outlines a cascading approach to pandemic communications that is closely aligned with the World Health Organization's pandemic phases.
- This annex is more comprehensive than the previous version and reflects recent work at the F/P/T level.

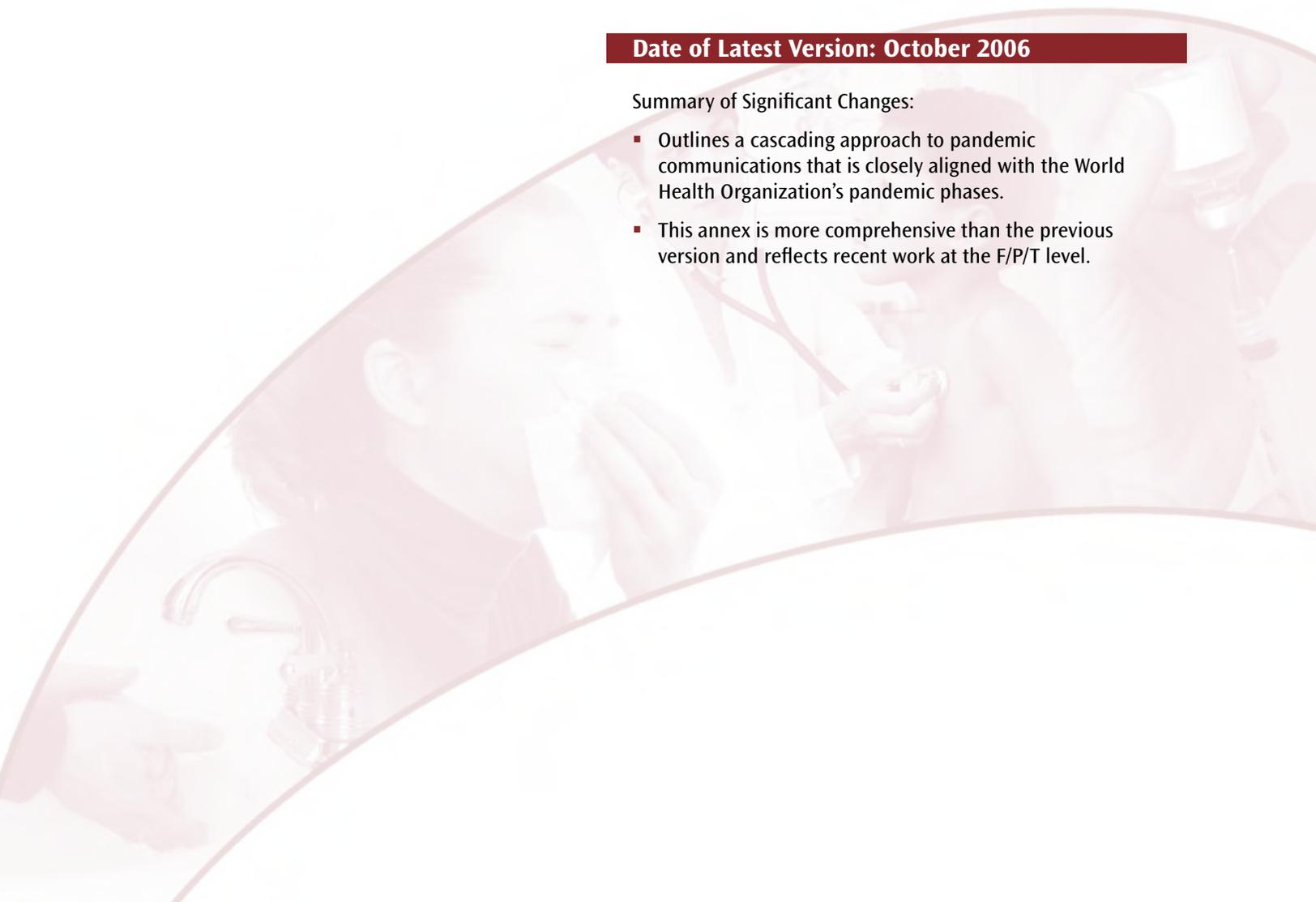


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Introduction

The objective of the Communications Annex is to show how Canada's health partners are preparing to respond to the public communications challenges associated with an influenza pandemic. Canadians will need accurate, timely and consistent information so they can take appropriate action to help minimize death, illness and social disruption. The Communications Annex was developed in partnership by federal, provincial and territorial governments through the Pandemic Influenza Communications sub-committee.

The strategies outlined in the Communications Annex provide the framework for consistent and coordinated public communications across all involved organizations. Strategies and tactics outlined in this document provide guidance to the organizations identified and will be implemented pending available resources.

The Annex outlines a cascading approach to pandemic communications that is closely aligned with the World Health Organization's pandemic phases. Roles, responsibilities, and strategies are outlined by jurisdiction and by WHO pandemic phase so that communications are appropriate to the threat level. Currently, activities for the inter-pandemic, pandemic alert and pandemic periods are identified. This Annex reflects current thinking on pandemic influenza communications and will continue to be revised as the plans of organizations evolve and new information and research becomes available.

Pandemic influenza communications planning is based on a strategic risk communications approach. This means that we would openly communicate pandemic influenza risks and control options, and that assumptions, values, methods and plans will be clear and accessible. Where facts are uncertain or unknown, the strategic risk communications approach supports transparency about information gaps and efforts to fill them.

The strategies outlined here are designed to promote well-coordinated, effective communications from federal, provincial, territorial governments and other health partners. Each level of government in Canada has unique stakeholders and responsibilities. The Communications Annex acknowledges these differences while reflecting the ongoing need for all levels of government to deliver consistent messages during an influenza pandemic.

Operational plans for public communications will reside within the specific organizations involved in the response to an influenza pandemic. The Communications Annex provides a working tool to ensure that these operational plans are closely tied to the roles and responsibilities highlighted in Annex K.

Provincial, territorial health ministries, and/or local authorities assume lead responsibility for public communications within their jurisdiction. If the pandemic moves beyond a single province or if a national emergency is declared, the Public Health Agency of Canada is the lead organization for national health communications, providing leadership in coordination of communications strategies and activities and in ensuring consistent messaging.

National Communications Goals

Citizen

To raise awareness of the threat of pandemic influenza (and other types of influenza) by building on annual influenza campaigns, leading to better self-protective measures.

Stakeholders/partners

To develop a comprehensive pandemic plan, with clearly identified roles and responsibilities, aligned with risk communications.

Organizational

To demonstrate leadership and coordination between jurisdictions in influenza and pandemic preparedness.

Public Health Agency

Primary Communications Roles	Primary Communications Responsibilities	Communications Options	Communications Strategies	Methods and Tools
<ul style="list-style-type: none"> To co-chair PIC Communications Subcommittee. 	<ul style="list-style-type: none"> To establish and maintain PIC Communications Subcommittee. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Formal research into Canadian interests and priorities to develop strategies and messages. Dialogue among key players – fed./P/T. Develop and maintain a network “map” or org chart, plus database. Develop and maintain matrix.
<ul style="list-style-type: none"> To steward communications plans. To build relationships (federal, provincial, territorial and international) to enhance communications response. 	<ul style="list-style-type: none"> To coordinate federal, provincial and territorial communications response. To develop and maintain Communications Plan. To share information. To seek opportunities to work together. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Matrix. Workplan. Message templates and draft messages. Ongoing meetings, workshops to ensure plan and matrix are up-to-date. Media Relations Plan, message development and testing. Research.
<ul style="list-style-type: none"> To define and establish networks with national stakeholders and partners. 	<ul style="list-style-type: none"> To establish stakeholder networks and roles and responsibilities. To support P/T in their development of stakeholder networks. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Teleconferences – PIC tripartite meetings – US, UK and Canada. WHO meetings. Alignment of research. Meetings. NGO Network, consultations on role of stakeholders, matrix to define roles and responsibilities. Tools and information developed with national stakeholders and partners, including matrix, plans and message templates.
<ul style="list-style-type: none"> To keep ministers and governments informed. 	<ul style="list-style-type: none"> To keep policy decision-makers aware of potential risks and public interest. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Regular briefings, speaking engagements, media opportunities.

Primary Communications Roles	Primary Communications Responsibilities	Communications Options	Communications Strategies	Methods and Tools
<ul style="list-style-type: none"> To establish link with WHO Communications. To establish and maintain international networks. To source and share primary information. 	<ul style="list-style-type: none"> To work with the WHO to support public health risk communications globally. To provide template materials that can be adapted to local needs. To support global risk communications training through WHO. To ensure alignment with national and WHO plans. To establish primary Canadian communications contact with WHO communicators. To liaise with WHO, US and UK. To provide international perspective back to Canada. To provide federal perspective/key messages to P/Ts. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Proactive. Communicate through PIC Communications team and other networks. 	<ul style="list-style-type: none"> WHO pandemic influenza communications framework. WHO Pandemic Influenza Communications Steering Committee. Participation in WHO meetings on risk communications. Ongoing information sharing. Share best practices. Solve problems. Organize regular opportunities for sharing. Document outcomes to ensure continuous learning. Build in ability to detect and correct at all levels – needs to be part of roles and expectations. Protocols for information-sharing between organizations.
<ul style="list-style-type: none"> To prepare media at national level for their information support role in a pandemic. 	<ul style="list-style-type: none"> To ensure media is prepared and has adequate background information to provide necessary support in case of a pandemic. 	<ul style="list-style-type: none"> Direct, consultative. 	<ul style="list-style-type: none"> Proactive on some aspects, opportunistic on others. 	<ul style="list-style-type: none"> Consult with key media (roles and responsibilities of media, key messages). Provide technical briefings for key national media. Proactive communications to media on pandemic preparedness. Technical briefings. Media backgrounder packages. Provide spokespersons to address media inquiries.
<ul style="list-style-type: none"> To ensure quality control. 	<ul style="list-style-type: none"> To establish and maintain a comprehensive monitoring system. 	<ul style="list-style-type: none"> Direct, consultative. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Regular (daily) media scans. Feedback to spokespersons.
<ul style="list-style-type: none"> To ensure all Canadians have access to important background information on pandemic influenza. 	<ul style="list-style-type: none"> To establish pre-tested background information on pandemic influenza. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Post information on PHAC website.
<ul style="list-style-type: none"> To promote business continuity and community planning. To engage the public on pandemic influenza preparedness. 	<ul style="list-style-type: none"> To inform different audiences about threat and implications, and provide information on what they need to do to prepare. To stimulate and support business leader continuity planning. To better understand public's views, help influencers understand challenges of pandemic influenza management. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Stakeholder meetings. Document on community planning, tool kits, exercises and scenarios. Expert discussions, town hall meetings.

Health Canada

Primary Communications Roles	Primary Communications Responsibilities	Communications Options	Communications Strategies	Methods and Tools
<ul style="list-style-type: none"> To engage First Nations and Inuit stakeholders to prepare for and respond appropriately to avian and pandemic influenza. 	<ul style="list-style-type: none"> To link with national FNs organizations to increase awareness of pandemic influenza and the necessity for planning. 	<ul style="list-style-type: none"> Direct, consultative and through First Nations and Inuit Health Branch regions. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Meetings. Tools and information developed with national aboriginal organizations and partners. Matrix, research, meetings.

Provinces/Territories

Primary Communications Roles	Primary Communications Responsibilities	Communications Options	Communications Strategies	Methods and Tools
<ul style="list-style-type: none"> To participate on PIC Communications Subcommittee. Identify one provincial or territorial co-chair of the PIC committee. 	<ul style="list-style-type: none"> To ensure PIC participation. To represent P/T communications interests. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Proactive, consultative. 	<ul style="list-style-type: none"> Participation in PIC meetings. Development of communications materials to raise awareness and readiness to act for identified partners, municipalities, provincial employees, stakeholders and public audiences based on message templates and messages developed by the committee. Dialogue among key players – fed./ P/T.
<ul style="list-style-type: none"> To provide leadership on P/T plan and national/regional coordination. 	<ul style="list-style-type: none"> To develop and maintain P/T Communications Plan. To ensure alignment of P/T plans with national plan. To ensure alignment with regional health authorities/local municipalities. 	<ul style="list-style-type: none"> Direct, consultative. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Strike provincial communications subcommittee. Conduct formal research aligned with the PHAC Option: self-audit amongst subcommittee members of plan readiness. Workshops, meetings, tele conferences, subcommittee.
<ul style="list-style-type: none"> To participate in communications planning for populations under provincial jurisdiction 	<ul style="list-style-type: none"> To develop a communications plan for area of responsibility 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Define roles and responsibilities; develop communications plan. Develop and test messages appropriate to these specific populations. 	<ul style="list-style-type: none"> Matrix, research, meetings.
<ul style="list-style-type: none"> To communicate with authorities to encourage them to develop their communications plans. 	<ul style="list-style-type: none"> To support the provincial government's response to an influenza pandemic. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Develop provincial roles and responsibilities matrix. 	<ul style="list-style-type: none"> Internal provincial/territorial communications strategy to raise awareness of need for emergency planning. Briefings.
<ul style="list-style-type: none"> To steward communications plans. To build relationships (federal, provincial, territorial) to enhance communications response. 	<ul style="list-style-type: none"> To liaise with federal, provincial and territorial governments to provide coordinated communications response. To develop and maintain Communications Plan. To share information. To seek opportunities to work together. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Matrix. Workplan. Message templates and draft messages. Ongoing meetings, workshops to ensure plan and matrix are up-to-date. Media Relations Plan, message development and testing. Research.

Primary Communications Roles	Primary Communications Responsibilities	Communications Options	Communications Strategies	Methods and Tools
<ul style="list-style-type: none"> To establish and maintain networks with PT stakeholders & partners. 	<ul style="list-style-type: none"> To communicate directly with Regional/Local Health Authorities. To make sure that the P/T plan is accessible and understood by stakeholders; partners' roles are clear; accountabilities are clear. To ensure health regions have communications plans. To assist with development and maintenance as required. To establish stakeholder networks and roles and responsibilities. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Workshops for partners and stakeholders. Email, web messages and teleconferences to partners and stakeholders. Plan to ensure common approach to risk communication and alignment on what to do and how to do it. Protocols for information-sharing between organizations. Orientation and networking workshops. Media relations program. Share pandemic plans. Alignment of research. Consultations on role of stakeholders, matrix to define roles & responsibilities. Tools & information developed with provincial stakeholders and partners, including matrix, plans & message templates.
<ul style="list-style-type: none"> To share best practices and problem-solve. 	<ul style="list-style-type: none"> To organize regular (at least annual) opportunities for sharing. To document outcomes to ensure continuous learning. 		<ul style="list-style-type: none"> Networking workshops. Provincial communications subcommittee and PIC Communications Subcommittee. 	<ul style="list-style-type: none"> Workshops, email.
<ul style="list-style-type: none"> To source and share information. 	<ul style="list-style-type: none"> To organize regular opportunities for sharing. To document outcomes to ensure continuous learning. To provide template materials that can be adapted to local needs. To ensure alignment with national plans. To establish primary provincial communications contact with federal communications. To provide national perspective back to province/territory. To provide provincial perspective/key messages to municipalities. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Proactive. Communicate through PIC communications team & other networks. 	<ul style="list-style-type: none"> Workshops, email, PSAs. Info packages out through schools, physicians, hospitals, etc. 1-800 numbers. Self-care info on websites. Organize regular opportunities for sharing.
<ul style="list-style-type: none"> To prepare media at provincial level for their information support role in a pandemic. 	<ul style="list-style-type: none"> To ensure media is prepared and has adequate background information to provide necessary support in case of a pandemic. 	<ul style="list-style-type: none"> Direct, consultative. 	<ul style="list-style-type: none"> Proactive on some aspects, opportunistic on others. 	<ul style="list-style-type: none"> Consult with key media (roles and responsibilities of media, key messages). Provide technical briefings for key national/provincial media. Proactive communications to media on pandemic preparedness. Technical briefings. Media backgrounder packages. Provide spokespersons to address media inquiries.

Primary Communications Roles	Primary Communications Responsibilities	Communications Options	Communications Strategies	Methods and Tools
<ul style="list-style-type: none"> • To ensure all residents have access to important background information on pandemic influenza. 	<ul style="list-style-type: none"> • To establish pre-tested background information on pandemic influenza. 	<ul style="list-style-type: none"> • Direct. 	<ul style="list-style-type: none"> • Proactive. 	<ul style="list-style-type: none"> • Post information on website.
<ul style="list-style-type: none"> • To promote business continuity and community planning. • To engage the public on pandemic influenza preparedness. 	<ul style="list-style-type: none"> • To inform different audiences about threat and implications, and provide information on what they need to do to prepare. • To stimulate and support business leader continuity planning. • To better understand public's views, help influencers understand challenges of pandemic influenza management. 	<ul style="list-style-type: none"> • Direct. 	<ul style="list-style-type: none"> • Proactive. 	<ul style="list-style-type: none"> • Stakeholder meetings. • Document on community planning, tool kits, exercises and scenarios. • Expert discussions, town hall meetings.
<ul style="list-style-type: none"> • To liaise between federal and regional/local. 	<ul style="list-style-type: none"> • To ensure that regions have federal and P/T messages, information on actions taken. 	<ul style="list-style-type: none"> • Direct. 	<ul style="list-style-type: none"> • Proactive. 	<ul style="list-style-type: none"> • Regular updates (email, teleconference).
<ul style="list-style-type: none"> • To keep ministers and governments informed. 	<ul style="list-style-type: none"> • To keep policy decision-makers aware of public interests. 	<ul style="list-style-type: none"> • Direct. 	<ul style="list-style-type: none"> • Proactive. 	<ul style="list-style-type: none"> • Regular briefings, speaking engagements, media opportunities.
<ul style="list-style-type: none"> • To ensure quality control throughout the P/T network. 	<ul style="list-style-type: none"> • To establish a comprehensive P/T monitoring system. • To provide feedback into PIC Committee. • To monitor, detect and correct. 	<ul style="list-style-type: none"> • Direct. 	<ul style="list-style-type: none"> • Proactive. 	<ul style="list-style-type: none"> • Media scans, detect-and-correct strategy, regular (daily) media scans. • Daily feedback to spokes persons. • Conference calls/emails. • Feedback to Committee as appropriate.

National Goals

Citizen

To inform citizens that organizations are mobilizing and that there is an elevated/increasing risk. Implementation of self-protective measures (if in Canada) so that they can develop a personal/family plan.

Stakeholders/partners

To communicate elevated/increasing risk signaling the need to start mobilizing their organizational plans. Alignment of response and messages.

Organizational

To demonstrate active leadership and alignment of risk minimization – morbidity, mortality and social disruption – and response activities (performance), while assuring readiness to act (in case of escalation). Alignment of response and messages.

Public Health Agency

Primary Communications Roles	Primary Communications Responsibilities	Communications Options	Communications Strategies	Methods and Tools
<ul style="list-style-type: none"> To alert provinces and territories of increased pandemic conditions so they can prepare to respond. 	<ul style="list-style-type: none"> To inform provinces and territories of increased risk associated with current situation. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Teleconference, email. Share communications products. Verify contact lists.
<ul style="list-style-type: none"> To provide national spokesperson. 	<ul style="list-style-type: none"> To provide information on national and international situation. To provide guidance. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Train key spokespersons.
<ul style="list-style-type: none"> To activate the communications plan for pandemic alert period. 	<ul style="list-style-type: none"> To update and review communications plans and networks. To provide updates to key stakeholders. To inform the public. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Preview and update plan as required. Inform media. Provide info to key national stakeholders (CMA and other health care provider groups). Provide statement to media from CPHO. Deliver media technical briefing. Launch website. Email message to key stakeholders, then statement to media. Share technical briefing materials with PIC Communications Subcommittee prior to technical briefing. Ensure web is updated frequently. Update toll-free line. Verify translation capacity.

Primary Communications Roles	Primary Communications Responsibilities	Communications Options	Communications Strategies	Methods and Tools
<ul style="list-style-type: none"> To broaden and intensify communications with ministers and MPs. 	<ul style="list-style-type: none"> To ensure ministers across the government are briefed on the increased risk and the relevance for their departments. To ensure that MPs have accurate and consistent information to provide to their constituents. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Update federal ministers. Brief provincial ministers on PHAC activities to facilitate coordinated messaging. Provide briefing updates, media lines through the PIC Communications Subcommittee to be adapted as background for P/T ministers.
<ul style="list-style-type: none"> To share technical and scientific information. 	<ul style="list-style-type: none"> To lead technical communications about the virus strain and the vaccine strategy. To interpret scientific, laboratory, statistical details. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Update communications products: speaking points, factsheets, etc., regularly to reflect changes in scientific data. Deliver technical briefings, news conferences.
<ul style="list-style-type: none"> To keep key national stakeholders informed (particularly health care provider organizations). 	<ul style="list-style-type: none"> To ensure that key national stakeholders have accurate information to provide to their audiences/media. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Inform key stakeholder groups of the current situation. Provide regular updates to key stakeholders to be shared with their specific audiences. Involve key stakeholders in discussions around communications with their stakeholders and audiences, and assessment of the effectiveness of that communication. Reinforce relationships developed through the planning process. Update stakeholder lists/database. Provide email/fax/phone updates. Post brief articles on stakeholder internal websites, or email to subscribers, etc.

Health Canada

Primary Communications Roles	Primary Communications Responsibilities	Communications Options	Communications Strategies	Methods and Tools
<ul style="list-style-type: none"> To communicate elevated risk levels to First Nations and Inuit, in partnership with provinces, territories and partners (see Plan, Appendix B). 	<ul style="list-style-type: none"> To ensure consistent messaging from all levels of government to First Nations and Inuit. To ensure federal messages regarding First Nations are communicated clearly to all partner agencies and stakeholders. 	<ul style="list-style-type: none"> Direct, consultative, collaborative. 	<ul style="list-style-type: none"> Work with communications to tailor messages. 	<ul style="list-style-type: none"> Co-ordinate messages with Public Health Agency, provinces and territories. Share consistent and appropriate information with stakeholders and spokespersons. Develop additional communications material to complement provincial /territorial material. Update Web site. Inclusion of FN&I indicators in ongoing surveillance activities.
<ul style="list-style-type: none"> To communicate elevation of emergency response capacity. 	<ul style="list-style-type: none"> To engage those involved in the emergency response communications team. 	<ul style="list-style-type: none"> Direct and consultative. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Identify surge capacity team, if required. Distribute email message widely to those involved in emergency response process (PIC Communications Subcommittee, key national stakeholders involved in response).

Primary Communications Roles	Primary Communications Responsibilities	Communications Options	Communications Strategies	Methods and Tools
<ul style="list-style-type: none"> To assess ongoing effectiveness of communications activities. 	<ul style="list-style-type: none"> To monitor and analyze media coverage. To track and monitor effectiveness of communications and public needs (POR, 1-800, web, public enquiries). 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Share media coverage analysis summary with P/Ts. Regular media scans. Daily feedback to spokespersons. Media analysis to determine need for additional technical briefings, other forms of media relations. Detect, correct, align. Utilize analysis to determine information gaps and effectiveness of current communications methods and messages (POR, review of correspondence, summary of questions to web, 1-800, etc.).

Provinces/Territories

Primary Communications Roles	Primary Communications Responsibilities	Communications Options	Communications Strategies	Methods and Tools
<ul style="list-style-type: none"> To communicate the elevation of pandemic risk to regional/local partners. 	<ul style="list-style-type: none"> To inform regional/local partners of increased risk associated with current situation. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Government email, intranet. Distribute message widely to those involved in emergency response process.
<ul style="list-style-type: none"> To activate the Communications Annex of the provincial plan. To encourage coordination. 	<ul style="list-style-type: none"> To update and review communications plans and networks. Through pre-developed communications networks, to encourage coordinated health region/district plan activation. To provide updates to key stakeholders. To inform the public. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Review and update as required throughout this phase. Inform key provincial stakeholders (prior to media). Provide info to key provincial stakeholders. Conduct media technical briefings. Update website frequently. Email message to key stakeholders, then statement to media. Share technical briefing materials with health region/authorities. Provide an interactive website for stakeholders.
<ul style="list-style-type: none"> To coordinate with other departments on the provincial/territorial communications response to a pandemic. 	<ul style="list-style-type: none"> To ensure a coordinated communications response for the entire government. To identify Government spokespersons and their areas of expertise. 	<ul style="list-style-type: none"> Direct and consultative. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Matrix, meetings, workshops. Key spokespersons coached to communicate technical messages to the public. Risk communications training. Key experts list established/shared with media.
<ul style="list-style-type: none"> To alert municipalities of increased pandemic conditions so they can prepare to respond. 	<ul style="list-style-type: none"> To inform municipalities of increased risk associated with current situation. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Teleconference, email. Share communications products. Verify contact lists.
<ul style="list-style-type: none"> To identify media spokespersons/experts. 	<ul style="list-style-type: none"> To coach key spokespersons to effectively communicate technical messages to the public. To provide information on provincial situation 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Provide media and risk communications skills training sessions and/or mock interviews for spokespersons and key experts.
<ul style="list-style-type: none"> To assess effectiveness of communications activities. 	<ul style="list-style-type: none"> To monitor and analyze media coverage. To set standards, guidelines and criteria for analyzing communications activities. 	<ul style="list-style-type: none"> Indirect. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Utilize media analysis to determine whether further technical briefings or other forms of media relations are necessary.

Primary Communications Roles	Primary Communications Responsibilities	Communications Options	Communications Strategies	Methods and Tools
<ul style="list-style-type: none"> • To broaden and intensify communications with ministers. • To inform key provincial stakeholders. 	<ul style="list-style-type: none"> • To ensure regular briefing updates for Premier's Office and minister(s). • To ensure that caucus offices (MLAs) have accurate information to provide to their constituents. • To ensure that key provincial stakeholders have accurate information to provide to their audiences/media. 	<ul style="list-style-type: none"> • Direct. 	<ul style="list-style-type: none"> • Proactive. 	<ul style="list-style-type: none"> • Use briefing updates, media lines provided through the PIC Communications Subcommittee as background for P/T ministers. • Combine federal updates with provincial/territorial information to provide a complete picture for ministers. • Updated stakeholder lists/database. • Email/fax/phone updates. Brief articles to be posted on stakeholder internal websites or emailed to membership, etc. • Meetings/conference calls to determine information gaps, next steps.
<ul style="list-style-type: none"> • To share technical and scientific information with health regions/authorities. • To encourage coordination of provincial/health region or authority/key stakeholder plan activation. 	<ul style="list-style-type: none"> • To provide technical communications about the virus strain and the vaccine strategy received from PHAC to health regions/authorities. • To provide the public with consistent and accurate messaging. 	<ul style="list-style-type: none"> • Link from provincial website to technical details on PHAC/national pandemic site. • Direct. 	<ul style="list-style-type: none"> • Proactive. 	<ul style="list-style-type: none"> • Technical briefings, news conferences (daily briefings as required). • Web. • In-depth interviews by experts with provincial health reporters or radio news magazines. • Update communications products: speaking points, fact sheets, etc., regularly to reflect changes in scientific data. • Discussions through predeveloped communications networks. • Regular meetings/networked conference calls to discuss next steps in plan roll-out.
<ul style="list-style-type: none"> • To design and test public education campaign. 	<ul style="list-style-type: none"> • To prepare a public education campaign that resonates with provincial residents. 	<ul style="list-style-type: none"> • Direct. 	<ul style="list-style-type: none"> • Proactive. 	<ul style="list-style-type: none"> • Research, focus groups, one-on-one interviews.

National Communications Goals

Citizen

To promote implementation of family/personal plans and encourage people to seek and follow direction from authorities.

Stakeholders/partners

To mobilize their plan fully and to follow direction from authorities. Alignment of response and messages.

Organizational

To demonstrate ongoing and effective management. Alignment of response and messages.

Public Health Agency

Primary Communications Roles	Primary Communications Responsibilities	Communications Options	Communications Strategies	Methods and Tools
<ul style="list-style-type: none"> To implement Pandemic Phase of National Plan. 	<ul style="list-style-type: none"> To review and update communications plan and make sure it is actionable. To update key stakeholders. To inform the public. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Teleconference, emails, web updates, sharing of communications materials.
<ul style="list-style-type: none"> To inform other government departments of global pandemic activity. To inform other government departments of the health portfolio response. 	<ul style="list-style-type: none"> To provide updates on global pandemic situation. To coordinate HC/PHAC response with OGDs. 	<ul style="list-style-type: none"> Direct, consultative. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Teleconference, emails, web updates.
<ul style="list-style-type: none"> To inform NGOs of global pandemic activity and health portfolio response. 	<ul style="list-style-type: none"> To provide updates on global pandemic situation. To coordinate health portfolio response with NGOs. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Consultative. 	<ul style="list-style-type: none"> Teleconferences, email, sharing of communications products.
<ul style="list-style-type: none"> To inform provinces and territories of global and Canadian pandemic activity. To inform provinces and territories of health portfolio response. 	<ul style="list-style-type: none"> To provide updates on situation. To coordinate health portfolio response with provinces and territories. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Consultative. 	<ul style="list-style-type: none"> Teleconferences, email, sharing of communications products.
<ul style="list-style-type: none"> To inform ministers and MPs of health portfolio response. 	<ul style="list-style-type: none"> To provide updates on current activities. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Briefing materials, media lines, Qs and As.

Primary Communications Roles	Primary Communications Responsibilities	Communications Options	Communications Strategies	Methods and Tools
<ul style="list-style-type: none"> To fully implement very high profile nationwide public education/awareness campaign. 	<ul style="list-style-type: none"> To inform public and stakeholders of actions needed to protect themselves. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Print ads, national radio ads, national television ads, outlining what to do/ what not to do/where to get vaccine, web ads.
<ul style="list-style-type: none"> To ensure consistency in messaging with provinces, international community and stakeholders. 	<ul style="list-style-type: none"> To explain, clarify and demystify the crisis. To inform people of self-care steps, progress of pandemic situation (anti-viral/vaccine, etc), and steps taken by the federal government and its stakeholders to provide necessary services to maintain population health/ social stability. To keep stakeholders/ partners up-to-date with the latest information, and aware of their roles/ responsibilities. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Frequent updating of PHAC website – public and provider pages (fact sheets, Qs and As etc.; educational videos on hand washing.) Relevant links to other sites. Operationalize call center and publicize toll-free numbers where public and providers can call for information or assistance.

Health Canada

Primary Communications Roles	Primary Communications Responsibilities	Communications Options	Communications Strategies	Methods and Tools
<ul style="list-style-type: none"> To inform First Nations communities of pandemic activity within Canada and actions needed to protect themselves. 	<ul style="list-style-type: none"> To coordinate response with the Public Health Agency, provinces, territories and First Nations communities. 	<ul style="list-style-type: none"> Direct, collaborative and through First Nations and Inuit Health Branch regions. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> More intensive communications with partners and stakeholders. Increased co-ordination on public information campaigns with Public Health Agency and partners. Distribution of materials through stakeholders and partners.
<ul style="list-style-type: none"> Authorizing the sale of drugs and vaccines for flu and flu related illnesses, monitoring their safety, and reporting the appropriate information to the public and stakeholders. 	<ul style="list-style-type: none"> To inform health professionals and general public of the authorization. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> The use of Notices to Hospitals, Dear Healthcare Professional Letters and Public Advisories and Warnings as well as other communications vehicles.

Provinces/Territories

Primary Communications Roles	Primary Communications Responsibilities	Communications Options	Communications Strategies	Methods and Tools
<ul style="list-style-type: none"> To implement pandemic phase of provincial/ territorial plan. 	<ul style="list-style-type: none"> To mobilize provincial spokespersons (preferably media trained). To ensure they have appropriate training and skills. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Daily news conferences. Make technical experts available for media technical interviews/briefings, local media events, etc.

Primary Communications Roles	Primary Communications Responsibilities	Communications Options	Communications Strategies	Methods and Tools
<ul style="list-style-type: none"> To ensure timely fourway communications sharing with fed. gov. and agencies, municipalities, stakeholders and providers. 	<ul style="list-style-type: none"> To present a united front with international, federal, municipal and health care partners. To provide updates on situation. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Teleconferences, email, sharing of communications products. Joint news conferences with local municipalities, fed. gov. and agencies. Compassionate, caring, empathetic, hard-hitting and forthright communications.
<ul style="list-style-type: none"> To fully implement very high profile province-wide public education/awareness campaign, aligned with national campaign. 	<ul style="list-style-type: none"> To inform public and stakeholders of actions needed to protect themselves. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> P/Ts to consider use of: <ul style="list-style-type: none"> print ads local radio ads television ads outlining what to do/ what not to do/where to get vaccine web ads.
<ul style="list-style-type: none"> To inform ministers and MPPs of health portfolio response. 	<ul style="list-style-type: none"> To provide updates on current activities. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Proactive. 	<ul style="list-style-type: none"> Briefing materials, media lines, Qs and As.
<ul style="list-style-type: none"> To ensure consistency in messaging with other provinces (use fed. gov. as point of contact), international community and local bodies. 	<ul style="list-style-type: none"> To explain, clarify and demystify the crisis. To keep people informed of self-care steps, the progress of pandemic situation (anti-viral/vaccine, etc), and the steps taken by the provincial government/ stakeholders to provide necessary services to maintain population health/social stability. To keep stakeholders/ partners up-to-date with the latest information, and aware of their roles/ responsibilities. To ensure the media has up-to-date information. To demonstrate transparency and accessibility. To select appropriate (trained) spokespersons. 	<ul style="list-style-type: none"> Direct. 	<ul style="list-style-type: none"> Mobilize press relations centre. P/T websites. Proactive. 	<ul style="list-style-type: none"> Frequent updating of ministry website – public and provider pages (fact sheets, Qs and As etc., educational videos on hand washing). Establish relevant links to other sites. Operationalize call center and publicize toll-free numbers where public and providers can call for information or assistance. Information specific to health and social services workers via websites, intranets, extranets and special bulletins/newsletters. Press releases and press conferences (regular or ad hoc), according to the severity of the pandemic. Translation of public information tools. Choice of spokespersons based on situation severity (from communications advisor to CMOH/ CPHO or minister). Fast activation of a telephone line to answer questions from the public and provide reassurance. Leaflets and posters widely distributed. Print and electronic media, through media placements and via public relations (bookings on information programs). Church bulletins. National media. Community television and print media. Mobilize network of those relaying information – as defined in previous phase – through a variety of media identified in the previous phase.

Primary Communications Roles	Primary Communications Responsibilities	Communications Options	Communications Strategies	Methods and Tools
<ul style="list-style-type: none"> To ensure consistency (continued). 	<ul style="list-style-type: none"> Public and commercial radio stations as well as community radio stations to transmit messages to specific audiences (regions most affected by the pandemic, etc.). Where applicable, broadcast information on radio networks specializing in health. Amateur radio broadcasters (members can relay information). 			<ul style="list-style-type: none"> Briefing sessions to disseminate specific information. Pre-recorded health advice (what to do) on telephone lines (while callers are on hold) of establishments in the health and social services network.

Federal Emergency Preparedness and Response System

Date of Latest Version: October 2006

Summary of Significant Changes:

- Reflects the establishment of the new department Public Safety and Emergency Preparedness Canada and the creation of the new Public Health Agency of Canada.
- Specific references to the new National Emergency Response System and the Federal Emergency Response Plan.

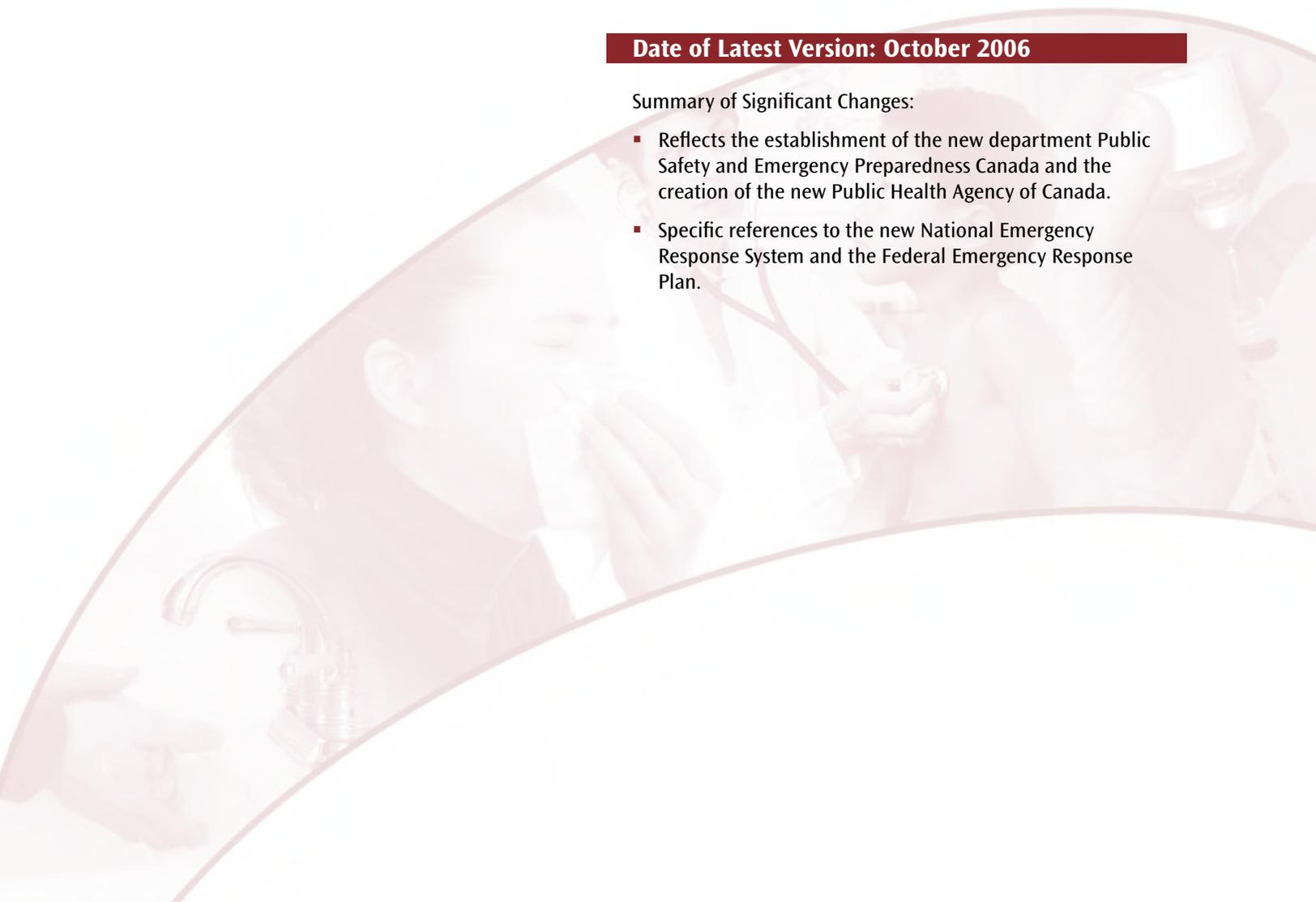


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1.0 The Federal System

Traditionally, and in accordance with “A Federal Policy for Emergencies,” the responsibility to deal with emergencies is placed first on the individual and then on successive levels of government, as the resources and expertise of each are needed. This recognizes that when an emergency occurs people normally see to their own safety to the extent possible, and then they seek assistance from local and provincial or territorial governments if necessary. Those governments in turn seek federal support if an emergency moves beyond their capabilities. This assistance may entail the coordination of supplies and services for response and recovery activities, the deployment of the Canadian Forces to aid civil authorities or the allocation of financial assistance to the provinces and territories (P/Ts).

The Government of Canada also works with local or regional authorities and coordinates the national response when the impacts of an emergency are mainly in areas that are clearly under federal jurisdiction, or when an event is clearly of national interest and interjurisdictional and/or international in nature.

At the federal level, the *Emergency Preparedness Act* establishes the inherent responsibility of each federal minister to develop and implement emergency preparedness measures. This is the basis for the Government of Canada’s emergency preparedness and management activities that have resulted in federal departments developing various response plans, such as the National Counter-Terrorism Plan, the Federal Nuclear Emergency Plan, the Canadian Pandemic Influenza Plan and a number of other similar plans.

Each of the P/Ts has its own emergency preparedness legislation that deals comprehensively with emergency management issues within their boundaries.

Based on recent emergencies, including SARS, the terrorist attacks of September 11, 2001, and the 1998 ice storm, the Canadian emergency management community has realized the importance of a “whole of government” response framework. Events in recent years have challenged governments at all levels and the private sector, stretching their abilities to cope with emergencies. These events have been studied extensively to determine the “lessons learned” and propose remedial action. Within this context, Canada has taken a number of initiatives, including the creation of a new department, the Public Safety and Emergency Preparedness Canada (PSEPC), the creation of a new agency, the Public Health Agency of Canada (PHAC), the development of a National Security Policy, and is currently developing a National Emergency Response System (NERS) to better meet the range of events faced by Canadians.

The Public Health Agency of Canada was created in response to growing concerns about the capacity of Canada’s public health system to anticipate and respond quickly and effectively to public health threats. The Agency will provide a clear focal point for federal leadership and accountability in managing public health emergencies and improved collaboration within and among jurisdictions.

The National Security Policy recognizes that addressing many threats and emergencies requires a coordinated approach with provinces, territories, non-governmental organizations (NGOs), the private sector and international partners. The policy sets out processes for engaging these partners in the development of coordinated plans to support the overall framework.

Public Safety and Emergency Preparedness Canada is developing the NERS so that Canada is prepared and able to respond to all emerging, imminent or occurring national emergencies and threats in order to ensure the protection and safety of Canadians. As different threats and emergencies arise, either as the result of natural or deliberately caused events or disasters, the NERS is designed to coordinate federal actions and provide an integrated and complementary national response.

Emergencies that are large and/or complex or that transcend provincial or international boundaries, such as a pandemic influenza, call for shared responsibilities. They also highlight the need for different or increased capacities and collaboration on all components of emergency management: mitigation, preparedness, response and recovery.

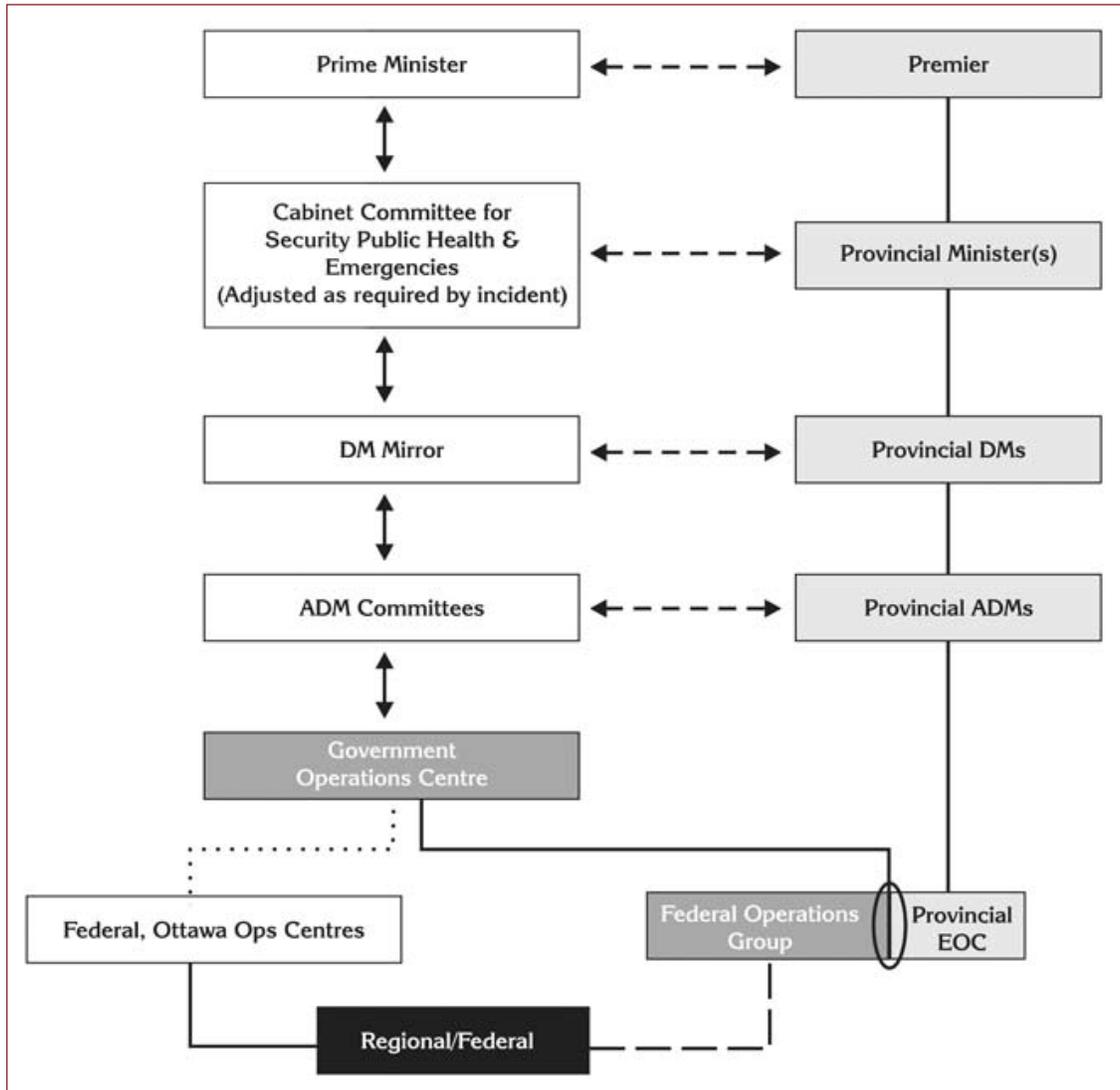
At the federal level, the health response to a pandemic will be mainly the responsibility of PHAC as the lead federal department with the division of provincial and territorial responsibilities as outlined in the current Canadian Pandemic Influenza Plan. An event, such as pandemic influenza, will require a response that goes far beyond the health sector. The government of Canada has created a Deputy Ministers Committee on Pandemic Influenza Planning to examine what is being done in terms of planning for a potential influenza pandemic. The Deputy Minister of Public Safety and Emergency Preparedness Canada co-chairs this committee with Canada's Chief Public Health Officer. The Committee provides direction to six working groups, ensuring that all key issues and gaps are identified and addressed. The six working groups will look at International issues, Federal Business Continuity and Human Resources Public Health and Emergency management, Communications, Economic and Social Impacts, and the Private Sector.

However, the NERS will coordinate the broader federal response. Indeed, the aim of the NERS is to ensure the strategic coordination of federal mandates in a Government of Canada emergency response, concurrent to P/T activities. The NERS is based on the Incident Command System and in an emergency the coordination of federal mandates will be achieved through the Government Operations Centre (GOC). Leading the GOC will be a Federal Coordinating Officer, who will be provided by PSEPC, but there will also be a Deputy Federal Coordinating Officer, who will be provided by PHAC.

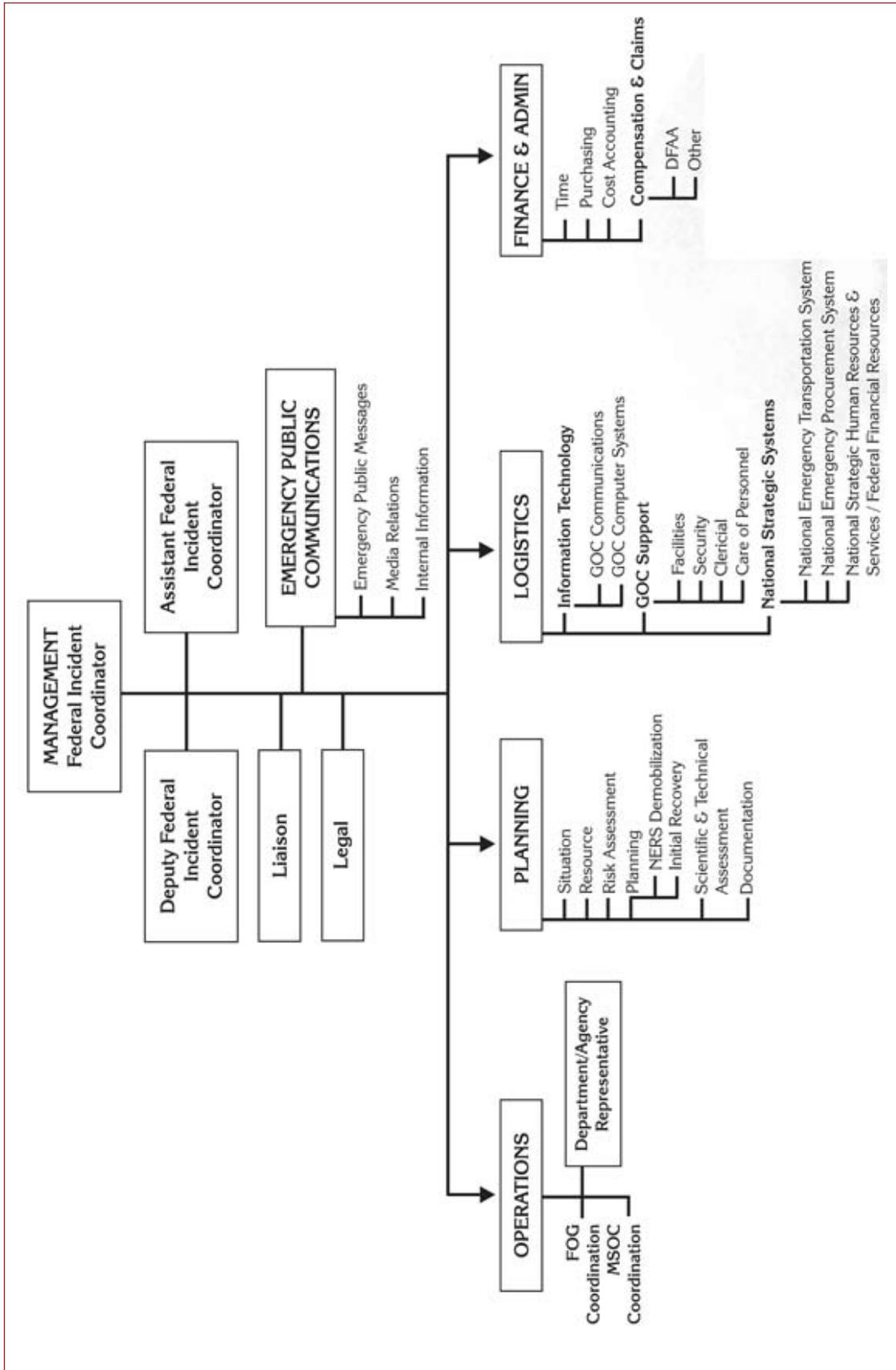
At the regional level, a Federal Coordination Group (FCG), acting as an extension of the GOC, will facilitate the regional interdepartmental emergency operational level coordination. The role of the FCG includes the coordination of regional federal resources and emergency response activities, and the coordination between the provincial response centre and the GOC.

These new agencies and systems will help ensure that federal leadership is exercised by making quick decisions, coordinating activities and resources at a strategic level, and communicating effectively with other federal entities, P/Ts, international organizations, NGOs, the private sector and the general public. All this must be accomplished while respecting P/T jurisdictions. From a national perspective, ensuring that authorities at all levels have a complementary framework for dealing with emergencies is a key preparedness objective. This is pivotal to public confidence and international credibility.

**National Response Structure
National Emergency Response System (NERS)
Strategic and Federal, Provincial and Territorial Interface**



National Emergency Response System (NERS)



2.0 Public Health Agency of Canada and Health Canada Emergency Response Plan

The *Emergency Preparedness Act*, 1988, requires all federal ministers to ensure that their departments, agencies or Crown Corporations have emergency preparedness plans to deal with civil emergencies related to their areas of accountability. For the federal health portfolio, the Minister of health is primarily accountable for developing and maintaining civil emergency plans for:

- public health protection, emergency health services and the well-being of Canadians; and
- coordination of the federal preparedness and response to nuclear emergencies not involving the hostile use of nuclear weapons in a declared war.¹

The Public Health Agency of Canada and Health Canada's Emergency Response Plan (PHAC/HC ERP) identifies the federal health portfolio's functions as either the lead or support role in responding to emergencies, including its role in providing medical, scientific, technical advice, assistance, materiel, advisories, and alerts and warnings to the Canadian public. The Public Health Agency of Canada, Health Canada and the ERP are key elements in federal health portfolio's overall emergency preparedness program.

The Centre for Emergency Preparedness and Response will support organizational units² in the development of its plans to address emergencies that fall within its program areas. The PHAC/HC ERP is a key element in the hierarchy of planning and response documents that includes the HC's Emergency Preparedness Policy, and individual organizational unit policies and plans. It represents a step in the development and articulation of the larger process and structure to manage PHAC's and HC's responses to a range of emergencies that could impact on the health and social well-being of Canadians.

The PHAC/HC ERP is an "all-hazards" plan that defines the scope and framework within which the PHAC and HC operate to ensure an appropriate response to any emergency. It also provides connecting arrangements to hazard-specific plans and procedural guidelines for emergency staff. This ERP addresses the scope and nature of relationships at all levels within the federal health portfolio and provides a framework to develop individual plans to address specific issues.

3.0 The Centre for Emergency Preparedness and Response

The Centre for Emergency Preparedness and Response (CEPR) has unique agency and departmental responsibilities in the areas of emergency preparedness and response, and it acts as PHAC's and HC's "single window" for "all hazards" preparedness and response operations. However, this does not circumvent organizational units from making their branch specific all-hazards preparedness, planning and training, and response operations. The CEPR staff is specifically responsible for interorganization coordination during agency and departmental response operations.

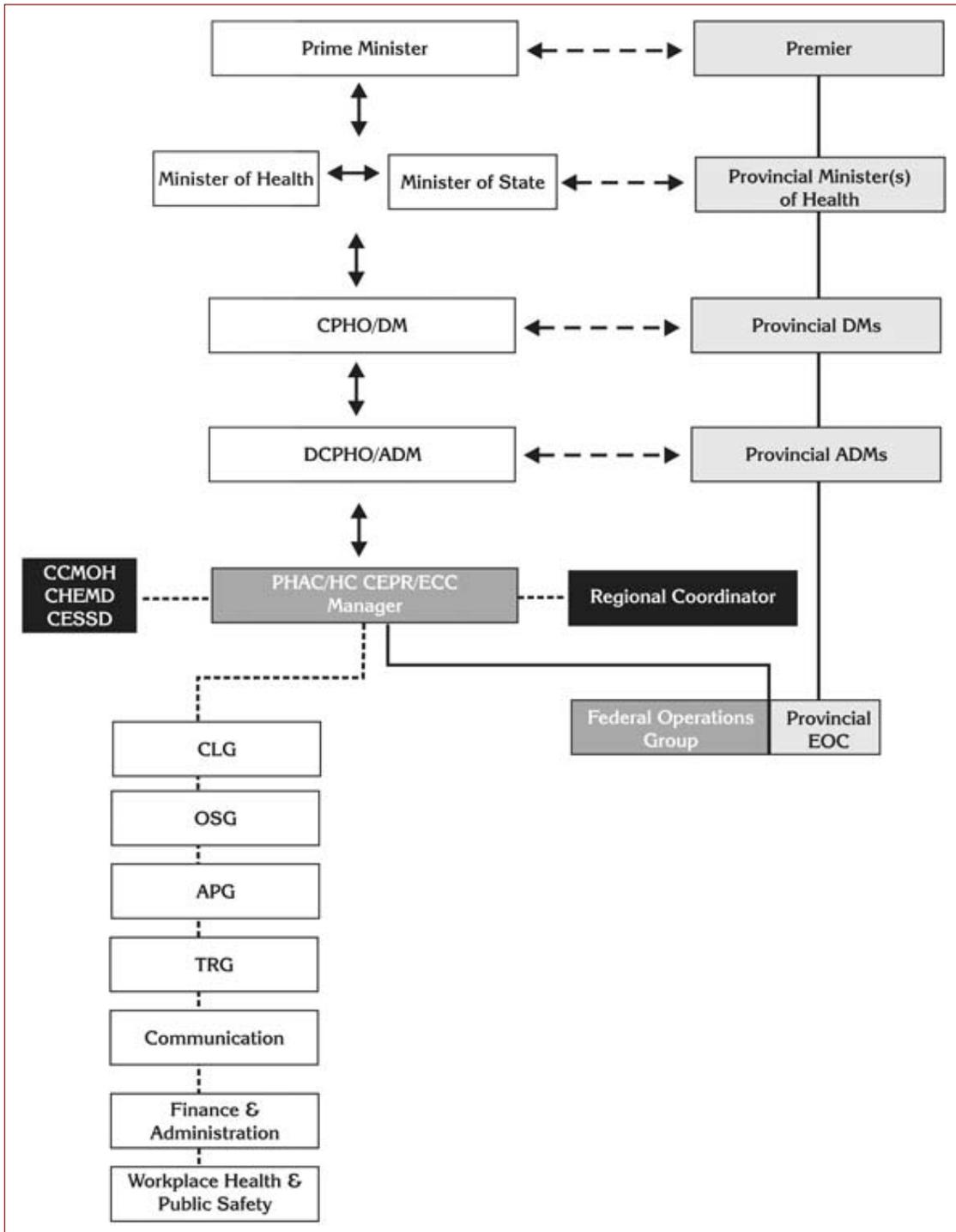
The Director General of CEPR acts as the Emergency Manager, and CEPR provides key staff to the response effort. During responses, the Emergency Manager reports to the Deputy Chief Public Health Officer and the Associate Deputy Minister (ADM) of HC through appropriate channels.

¹ Federal Nuclear Emergency Response Plan

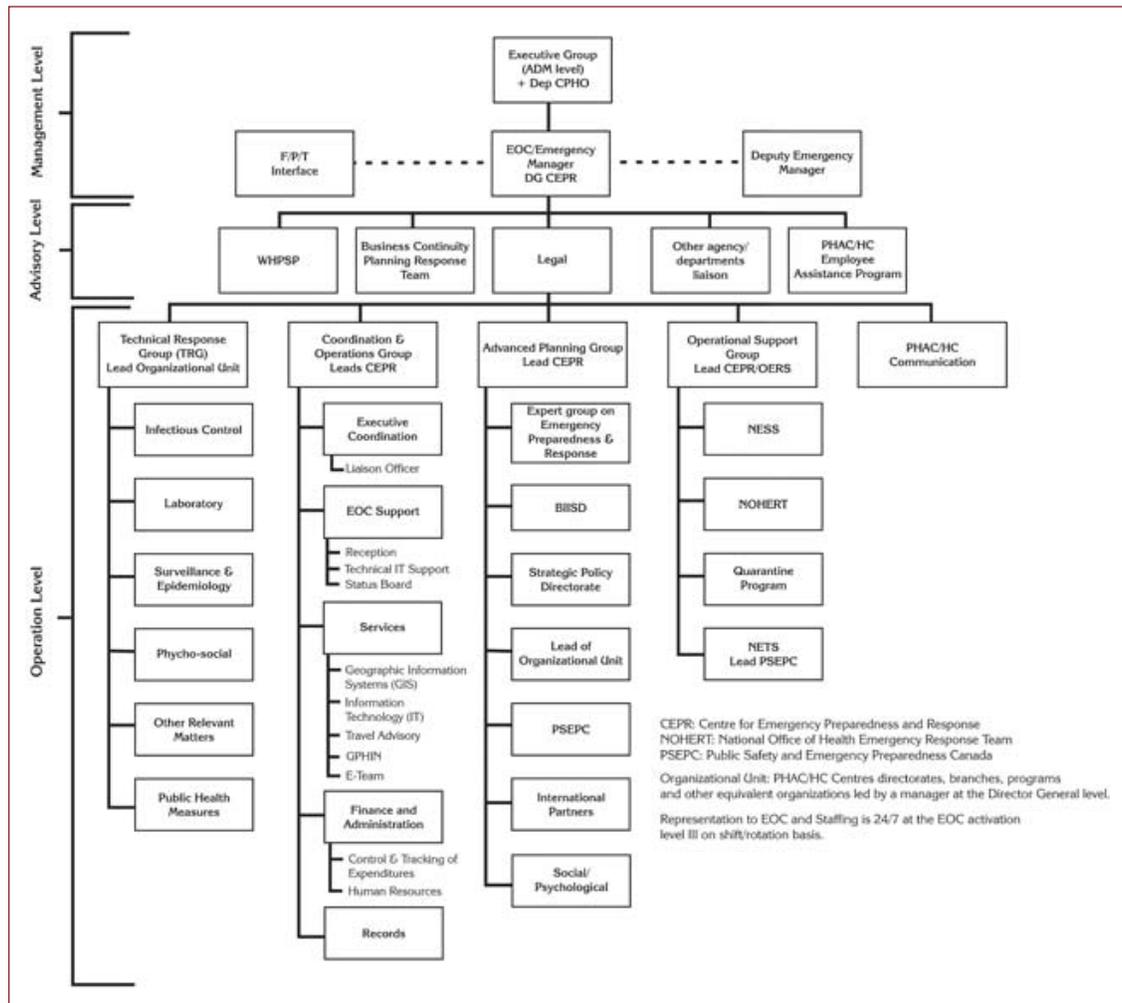
² The term "organizational unit" will be used throughout this document to refer to centres, directorates, branches, programs and other equivalent organizations led by a manager at the Director General level.

The CEPR manages and maintains the health portfolio's Emergency Operation Centre (EOC), the major infrastructure resource in support of response activities. The CEPR is also responsible for control and maintenance of the National Emergency Stockpile System (NESS). This reserve of medical resources such as hospital equipment and pharmaceuticals could be critically important in a major response effort.

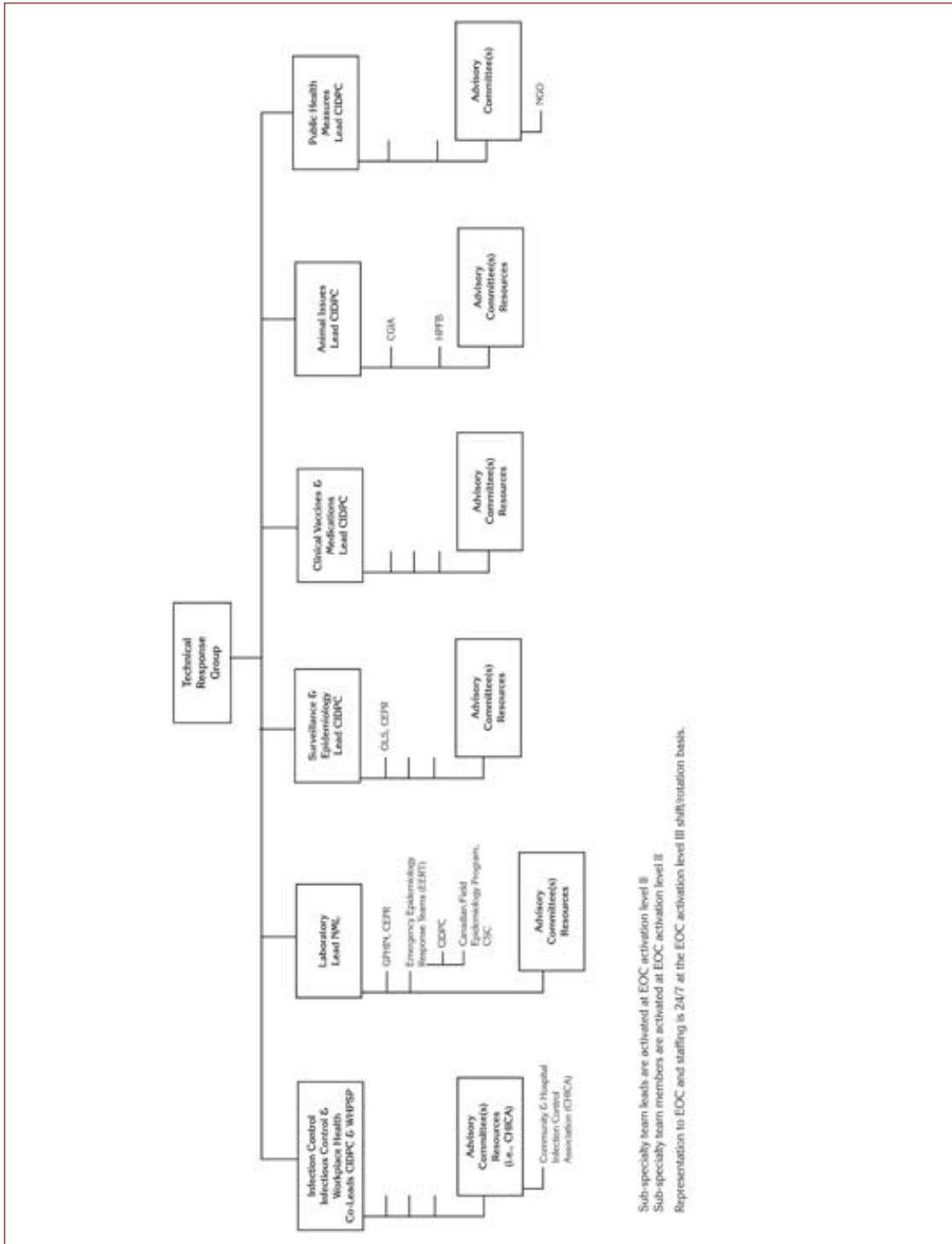
Public Health Agency of Canada, Health Canada, and Federal, Provincial and Territorial Interface



Public Health Agency of Canada and Health Canada Pandemic Influenza Emergency Response Structure



Technical Response Group Structure:



For further information on PHAC/HC Emergency Response Plan please contact:

Director
 Office of Emergency Preparedness, Planning and Training
 Centre for Emergency Preparedness and Response
 Public Health Agency of Canada
 Ottawa, ON K1A 0K9

Public Health Measures

Date of Latest Version: October 2006

Note:

- This is a new annex being released with the 2006 version of the Canadian Pandemic Influenza Plan.

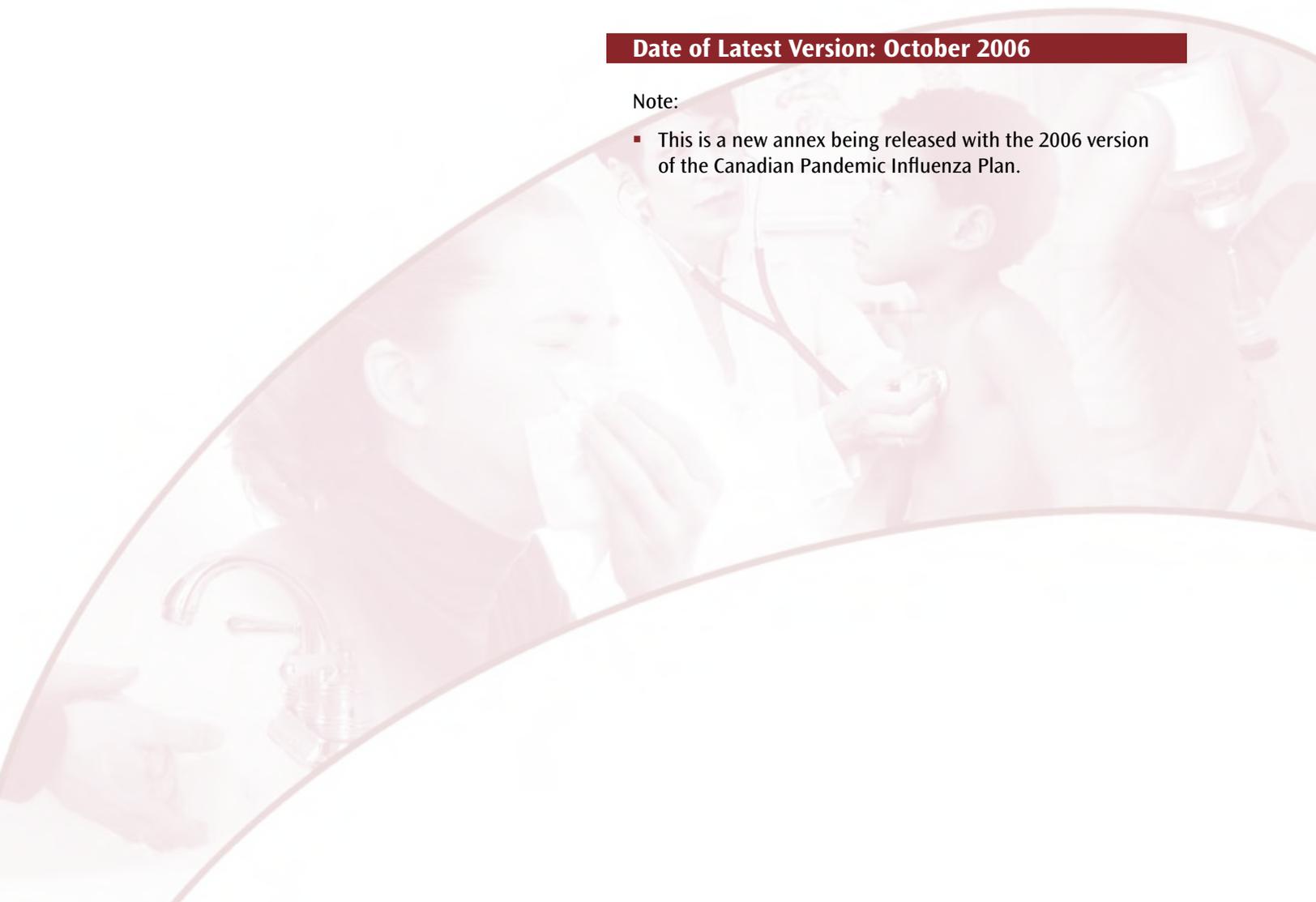


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1.0 Introduction

As an influenza pandemic evolves, the role of public health and consequently the public health measures put in place will shift as priorities and strategies change. The overall goals of influenza pandemic preparedness and response are:

First, to minimize serious illness and overall deaths, and second to minimize societal disruption among Canadians as a result of an influenza pandemic.

The strategies used to reach this goal will vary according to the phase of the pandemic, the availability of resources (e.g. human, vaccine, antivirals) and the epidemiology of the pandemic. Given the many possible combinations of these variables, this document endeavours to provide overall guidance. It is expected that the provided recommendations will be considered and modified as necessary when responding to a specific pandemic or pandemic threat.

Unlike other aspects of this illness (e.g. virologic characteristics), public health measures directed toward community disease control have not been well studied or reported in the scientific literature. Therefore in developing this document, the Public Health Measures Working Group of the Pandemic Influenza Committee (the Working Group) has relied mainly on expert consultation to form the recommendations. The conclusions of this group were compared with the results of an international consultation on public health measures at a March 2004 World Health Organization (WHO) meeting⁽¹⁾ and were found to be consistent. The report from the WHO consultation meeting was also used as a source of additional details that are included in this document, specifically under section 9, Travel and Border-Related Issues, in this annex.

In the absence of scientific efficacy data for many of the potential public health measures, the Working Group presents these recommendations to help facilitate a common approach to community disease control. This will reduce the need to explain and justify divergent approaches at the time of a pandemic and may also optimize public confidence at a time of much uncertainty. Many of the recommendations are contingent upon local triggers; therefore, the timing of their implementation will not necessarily be simultaneous across the country, but ideally the types of measures and public health messages will be consistent. In general, there is global agreement that, when cases infected with a novel virus first appear, aggressive measures will be valuable in delaying the impact or possibly containing an evolving pandemic.

During an influenza pandemic, public health authorities will be involved in a broad range of activities, including but not limited to surveillance, case and contact management, public education, coordination and delivery of vaccine programs, implementation of community disease control strategies, and potentially the organization of a treatment-focused antiviral strategy, and the establishment and administration of non-traditional health care sites. Because surveillance issues, vaccine program considerations and the public health role in non-traditional sites have been addressed in other sections of the Canadian Pandemic Influenza Plan (the Plan) (available at: <http://www.phac-aspc.gc.ca/cpip-pclcpi/index.html>), this document will focus on the other previously identified public health activities.

2.0 Principles and Assumptions

The recommendations included in this document are predicated on the following principles and assumptions:

- The incubation period, period of communicability and method of transmission for the novel strain will be consistent with other known influenza strains, that is:
 - Incubation period: 1 to 3 days;
 - Period of communicability: 24 hours before to up to 5 days after onset of illness (usually up to 3 to 5 days in immunocompetent adults, up to 7 days in young children);
 - Method of transmission: large droplet and contact (direct and indirect);
 - Possibility of transmission by the airborne route is uncertain¹; and
 - Transmission while asymptomatic is possible but it is more efficient when symptoms, such as coughing, are present and viral shedding is high (i.e. early in symptomatic period).
- The novel virus will be highly infectious (i.e. transmitted efficiently from person to person).
- The initial clinical presentation will be consistent with known influenza strains.
- Sub-clinical infection will occur.²
- It is unlikely that an effective vaccine will be available at the start of pandemic influenza activity in Canada but it may be available for a second wave.
- Public health authorities will play a major role in the distribution and administration of vaccine.
- Mass immunization campaigns will occur when sufficient quantities of the new vaccine are available; this will increase the demand for public health human resources.
- The use of antivirals to decrease the risk of transmission from the first cases infected with a novel virus and their contacts will be considered as a strategy to contain or slow the spread of novel viruses that have pandemic potential and that are identified in Canada. The use of this strategy will be limited to cases identified early in the Pandemic Alert Period³ in Canada. During the Pandemic Period, this strategy will change to the nationally agreed upon antiviral strategy for the Pandemic Period.
- In the absence of data on duration of shedding and the effect of neuraminidase inhibitors on viral load and shedding of the novel virus, the objective of treatment with antivirals is to improve clinical outcome, which is assumed to correlate with decreased communicability.
- Individuals who recover from illness caused by the pandemic strain will be immune to further infection by that strain.
- The novel influenza strain and first human cases will be identified outside of Canada.
- Surveillance measures are in place to detect influenza-like illness (ILI) across Canada.

1 An outbreak of influenza on an airliner has been attributed to airborne spread; however, large-droplet spread could have been responsible because the passengers were crowded together and moved about for several hours in a small, grounded airplane. Although experimental airborne transmission of influenza A virus to mice has been reported, there is no evidence of such transmission in humans.

2 In a recent British study, 59% of health care workers with serologic evidence of recent influenza infection could not recall having influenza; this suggests that many experienced sub-clinical cases.⁽²⁾

3 The role of antivirals during the Interpandemic Phase has been addressed elsewhere with respect to the response to an outbreak of avian influenza in Canada.⁽³⁾

- The pandemic strain may cause more than one wave of illness.⁴
- The public will be interested in all methods of personal protection against infection.
- Public acceptance of restrictive control measures will positively correlate with the proximity of cases.
- It may be possible to delay introduction of pandemic influenza into isolated communities; however, it is not likely that this strategy could be sustained especially if the virus has acquired the ability to spread efficiently from human to human.
- The latest WHO and Canadian pandemic phase terminology will be used in planning and response.

During the Pandemic Alert Period there is an expectation that measures will be taken to contain the novel virus at source. During the Pandemic Period the goal has a mitigation focus, that is, to minimize morbidity, mortality and societal disruption. Therefore the recommended actions in this annex differ for these two distinct periods. An example of this is the recommendations for antiviral use for contacts of cases. The containment strategy requires further discussion at the national level, however in the meantime the recommended measures are expected to be applicable should containment be necessary.

3.0 Public Education

Public education is a key activity for public health authorities during all the pandemic phases. During the Interpandemic Period (Phase 1 and Phase 2), most influenza-related educational initiatives will likely focus on general facts about influenza, the influenza vaccine and trends during the current and recent seasons. However, this period is also the optimal time to prepare educational initiatives and introduce concepts (e.g. need to modify recommendations as the pandemic evolves) that will be necessary during a pandemic.

3.1 Recommendations

- Prepare educational materials for the general public during the Interpandemic Period; these can be used in and/or modified for each phase of the pandemic threat. Focus on risks and risk avoidance, universal hygiene behaviours (including “respiratory hygiene”) and information that will be needed to reduce transmission of illness (including how to seek medical attention in a way that minimizes exposure opportunities), and prepare the general public for the next phase.
- Review and update educational materials for health professionals. Reinforce existing recommendations for management of patients that present with febrile respiratory illness including the provision of masks for coughing patients.
- Anticipate special educational and resource needs, for example, translation requirements and targeted packages for more specific groups (e.g. physician offices, school boards, daycare operators, other business owners, travellers, etc.)
 - During the Interpandemic Period, consider speaking to business owners to encourage business continuity planning that is appropriate for the unique challenges that would be presented by an influenza pandemic.

⁴ The WHO has noted that in the past “more severe disease has tended to arrive with the second wave.”⁽⁴⁾ This observation has not affected the recommendations in this document but it is an important consideration for planning purposes.

- Similarly, school boards should be encouraged to strategize with regard to continuation of education (e.g. Internet or other ways for students to receive and submit assignments) in the event that school facilities are closed.
- Ensure appropriate linkages are in place with communications staff within the public health organization and determine roles, responsibilities and information flow in the event of a pandemic. Together with communications staff:
 - Have a toll-free telephone information line established or ready to be rapidly implemented, with prepared transcripts for phone-line staff.
 - Consider components of the information dissemination process, including Web-based postings as well as print materials.
- Develop templates for specific purposes, such as consent for immunization, and public education about indications for the access to antiviral treatment.
- Ensure ongoing training of staff within the public health authority to ensure that expertise is not lost because of staff turnover.

3.2 Goals and Anticipated Outcomes

- Minimize the time needed to disseminate educational materials to the public during an alert and as the pandemic evolves and information needs change.
- Increase baseline public knowledge (i.e. before an alert is issued) by providing information on pandemic influenza during the Interpandemic Period.
- Establish the public health authority as an accurate, reliable and trusted source of information on pandemic influenza through a well-coordinated and prepared education and communication plans.

3.3 Rationale

An influenza pandemic is a global health emergency and therefore public demand for information will be extremely high and sustained as the illness spreads from remote areas and/or countries to Canada and into local communities. Unlike the severe acute respiratory syndrome (SARS) experience where the epidemiology of the disease and the causal organism was initially unknown, a significant amount of information on influenza is available and this can guide the development of generic fact sheets and specific templates for later use.

Before a pandemic vaccine is available, the mitigation of the potential effects of a pandemic will be largely contingent upon the actions of a public that receives, trusts and acts upon timely public education messages. Public health authorities at all levels of government will need to facilitate this process as much as possible.

In March 2004, WHO hosted an international consultation on priority public health interventions before and during an influenza pandemic. The consultation report concluded, “health authorities will need to make a series of emergency decisions in an atmosphere of considerable scientific uncertainty and fragile public confidence. Prior guidance on which interventions are most likely to be effective and feasible at different phases is therefore greatly needed as part of preparedness planning.”⁽¹⁾

3.4 Feasibility and Requirements

Most public health authorities already see public education on these types of health issues as one of their key responsibilities. The contacts established by other public health programs that target schools, large business owners, governments and municipalities could facilitate the implementation of the above recommendations—in particular, presentations on pandemic preparedness that would be specifically aimed toward these groups. Because it is not known when a novel virus will emerge and cause a pandemic, it is important that several trained staff remain familiar with this issue and can be diverted when needed to work on educational materials without notice.

The communications component of the Plan will need to be considered and incorporated into all public education activities in order to present a coordinated response. A pre-established, well-advertised Web site and pre-determined channels for the dissemination of printed materials and e-mail communications are important requirements for effective public education campaigns. An available toll-free telephone line with trained staff will also be an important requirement to maximize the propagation of educational messages.

3.5 Impacts and Stakeholders

Because the demand for information will be enormous and also likely remain high as the pandemic evolves, the impact on staffing within public health authorities will be substantial. Municipal governments and the broader emergency response structure will also be involved in the delivery of public education messages at the local level; public health authorities will be impacted if they are asked to develop and review the content of these messages. The objective is to have a positive impact on the public by anticipating their educational needs and preparing to meet those needs as soon as possible. If this is achieved, public health authorities are more likely to be seen as reliable sources of timely information.

Likely stakeholders will include the entire population who will need general information and specific groups who will need more detailed or specific information, including direction about response activities.

3.6 Anticipated Compliance and Acceptability

Because most public health authorities have the capacity to develop and deliver public education and are established sources of health information in their respective jurisdictions, it is anticipated that their role as educators during an influenza pandemic will be highly acceptable. However, it will be critical to ensure sustained credibility by providing informed, consistent, clear and timely messages.

Compliance with public education will likely be high, especially if the community is already experiencing cases. The perception of personal risk will likely increase as the proximity to cases increases, and it will result in more and more people seeking information on personal protective measures.

4.0 Avian Outbreaks in Canada during the Interpandemic Period

Although it is considered unlikely that a pandemic strain will first emerge in Canada, the public health system needs to be prepared to deal with this possibility. Recent outbreaks of avian influenza both in Asia and in North America have highlighted the need for clear guidelines to manage these outbreaks. Following the outbreak of highly pathogenic avian influenza in British Columbia in the

spring of 2004, interim guidelines were developed. Those guidelines have recently been updated and are now found in the document: Human Health Issues Related to Avian Influenza in Canada. This document was developed by PHAC with input from all provinces and territories and is available through the Avian influenza link on the PHAC website (available at: <http://www.phac-aspc.gc.ca>).

The purpose of the interim guidelines is to provide recommendations and tools for public health authorities and other stakeholders involved in the management of human health issues related to domestic avian influenza outbreaks. The recommendations are organized to align with certain components of the Plan, i.e. surveillance, public health measures, infection control, antivirals and vaccine programs. Because the occurrence of a single human case of avian influenza usually denotes the onset of the Pandemic Alert Period in Canada, the interim guidelines are consistent with the recommendations herein for case and contact management during Pandemic Alert Period, Canadian Pandemic Phase 3.1. This annex (i.e. Annex M, Public Health Measures) will become the appropriate reference if human-to-human transmission of the novel virus is observed, at which time aggressive measures will be initiated in an attempt to control or delay the spread of the virus. These measures are presented under the Pandemic Alert Period subheadings under section 5, Public Health Management of Individuals with Influenza-like Illness, and section 6, Management of Contacts of Cases, which follow in this annex.

5.0 Public Health Management of Individuals with Influenza-like Illness

This section includes recommendations for the public health management of people with ILI who have been infected with a novel influenza virus during a pandemic alert and people meeting the national case definition during the pandemic. (The current definition for ILI is available at: www.phac-aspc.gc.ca/fluwatch/index.html). Modified case definitions developed during a pandemic alert or once pandemic activity is occurring will also be posted on the PHAC Web site and distributed to provinces and territories directly by PHAC.

These activities will be initiated when one or more human cases infected with the novel virus are identified in Canada. Until then, case and contact management should follow the guidelines for the Interpandemic Period (or any modified versions of the interpandemic guidelines due to the occurrence of a pandemic alert outside of Canada). However if a medical officer of health has a high level of suspicion that an ill individual might be infected with the novel virus (e.g. an ill traveller with a epi-link to an affected area and for whom laboratory results are pending), the actions described below may be implemented as a precaution until the case can be confirmed.

The recommendations below refer to the management of ill individuals identified in Canada during the specified pandemic periods and Canadian pandemic phases.

5.1 Recommendations

- Encourage all ill individuals (and those providing care to such individuals) to practice good hand and respiratory hygiene (e.g. frequent handwashing, covering the mouth when coughing, etc.) and to frequently clean and disinfect surfaces that could be potentially contaminated with respiratory droplets for the duration of their illness. (See Annex F for additional details and recommendations on infection control.) Also advise them when to seek medical attention and how to do this in a way that minimizes potential exposures (e.g. take a private vehicle instead of public transit if possible).

Recommendations for Management of Individuals with ILI (presumed novel/pandemic flu):

Pandemic Alert Period: Sporadic activity in Canada – Phase 3.1, Phase 4.1 and Phase 5.1

Indicator: Single human case(s) with a novel virus subtype in Canada with no spread, or at most rare instances of spread to a close contact only. Outside of Canada, clusters resulting from human-to-human transmission may be occurring (e.g. Phase 4.1 and Phase 5.1) but the virus has not demonstrated the efficiency of transmission necessary to cause a pandemic.

- Facilitate appropriate management of ill individual(s) suspected of having the novel virus and who are identified through the surveillance system.
 - Disseminate messages to front-line health care providers in conjunction with enhanced surveillance protocols with regard to the notification and reporting processes for ill individuals of concern (i.e. those with a potential risk factor due to travel or contact with an infected avian or animal source), any updates on infection control precautions, clinical management or laboratory testing recommendations.
- Report ill individuals and facilitate laboratory testing, as agreed upon in the enhanced surveillance process, to the provincial or territorial and federal authorities in the requested format.
- Isolate the ill individual either in hospital (if clinically indicated or recommended, based on available epidemiological data) as per current infection control guidelines or at home.
 - In-home management should include follow-up of the case and their close contacts (see the general recommendations under 6.1 below) through active surveillance, education about infection control precautions in the home setting and instructions about what to do if their illness progresses.
 - Adults recommended for self-isolation at home should stay there for a minimum of 5 days after onset of symptoms (7 days for young children) or until symptoms have resolved, whichever is longer, unless they need to visit a health care provider⁵ or unless an alternative diagnosis is made. During this period, they should avoid close contact with unexposed household members.
- Medical management of these individuals should include treatment with antiviral drugs, depending on the sensitivity profile of the novel virus. This treatment will need to be monitored, with any relevant outcomes (e.g. clinical deterioration despite initiation of antivirals within 48 hour of symptom onset, laboratory evidence of viral resistance, compliance problems, adverse events) to be reported to the appropriate public health authority.

Recommendations for Management of Individuals with ILI (presumed novel/pandemic flu):

Pandemic Alert Period: Localized or widespread cluster activity in Canada – Phase 4.2 or Phase 5.2

Indicator: Cluster(s) occurring in Canada with “limited” (Phase 4.2) or “substantial” (Phase 5.2) pandemic risk based on various factors, e.g. rate of transmission, geographic localization and spread, severity of illness, impact of control measures, presence of genes from human strains (if derived from an animal strain), other information from the viral genome and/or other scientific information. Outside of Canada, clusters may be occurring (assuming the virus did not originate in Canada) but the virus has not demonstrated the efficiency of transmission necessary to cause a pandemic.

⁵ The case should be given instructions about infection control measures to be implemented if they must leave their home to visit a health care provider (e.g. phone ahead, wear a mask)

- Aggressively implement protocols for influenza case and outbreak management⁶ with consideration of the recommendations on infection control in Annex F.⁷ These measures include:
 - isolation of cases,
 - laboratory testing of suspect cases,
 - closing of affected hospital wards or institutions to visitors, etc.,
 - aggressive contact tracing and follow-up (see section 6 below, Management of Contacts of Cases), and
 - reporting individual cases to provincial/territorial and federal public health authorities.
- Medical management of cases presenting within 48 hours of symptom onset should include antiviral treatment. Public health authorities may help coordinate the distribution of antivirals because supplies may be limited and prioritization may be necessary. (See Annex E, Planning Recommendations for Anti-influenza (Antiviral) Drugs in Canada During a Pandemic, for additional details.)

As previously noted, antiviral treatment will need to be monitored with outcomes (clinical, laboratory and compliance) reported to the appropriate public health authority.

Note: During the Pandemic Alert Period (i.e. prior to declaration of a pandemic), it is anticipated that antiviral drugs will be used to treat the first cases identified in Canada and attempt to control subsequent spread from these cases. When the pandemic is declared or the supplies dedicated for this early control strategy are exhausted, the antiviral strategy will change to focus on the overall goal of the pandemic response by encouraging dispensing of these medications using the nationally agreed-upon antiviral strategy for the Pandemic Period.

Recommendations for Management of Individuals with ILI (presumed novel/pandemic flu):

Pandemic Period: Sporadic Cases occurring in Canada – Phase 6.1

Indicator: Single human case(s) with the pandemic virus detected in Canada. No cluster(s) identified in Canada.

Note: If the incubation period, period of communicability and method of transmission for the novel strain are consistent with other known influenza strains, it is likely that this phase will have a very short duration or may even be skipped in Canada (i.e. novel virus activity may not be detected prior to the occurrence of a cluster of cases).

- Facilitate appropriate management of the ill individual(s) suspected of having the novel virus, identified through the surveillance system.
 - Rapidly disseminate messages to front-line health care providers indicating that the novel virus has been detected in the community.

⁶ It is recognized that individual case management by public health authorities will not be sustainable and, depending on the geographical distribution of cases, may need to be discontinued prior to the Pandemic Phase in jurisdictions that are heavily impacted during the Pandemic Alert Period (i.e. Canadian Pandemic Phase 5.2).

⁷ For example, this may include triage and provision of surgical masks to patients with respiratory illness presenting for a medical assessment (when cases have already occurred in the specific community).

- If necessary, update and distribute the reporting protocol for suspect cases (i.e. highlighting what may have changed between the Pandemic Alert Period and the Pandemic Period in terms of reporting expectations).
- Distribute any updates on infection control precautions, clinical management or laboratory testing recommendations.
- Report ill individuals to the P/T and federal authorities in the requested format.
- Facilitate laboratory testing as agreed upon for the Pandemic Period.
- Isolate the ill individual(s), as per current infection control guidelines, in hospital (if clinically indicated or recommended, based on available epidemiological data), at an alternate care facility or at home.
 - In-home management should include follow-up of the case and their close contacts (see recommendations under 6.1 below) through active surveillance, education about infection control precautions in the home setting, and instructions about what to do if their illness progresses.
 - Individuals recommended for self-isolation at home should stay there a minimum of 5 days after onset of symptoms (7 days for young children) or until symptoms have resolved, whichever is longer, or if known, until the end of the period during which they are expected to be communicable, unless they need to visit a health care provider⁸ or unless an alternative diagnosis is made. During this period, they should avoid close contact with unexposed household members.
- It is expected that antiviral drugs from the National Antiviral Stockpile will be used for treatment of all persons with influenza-like illness (presumed pandemic influenza) who are ill enough to need care, and who are assessed within 48 hours of the onset of symptoms. (See Annex E for additional details on antivirals.)
- If cases have occurred in Canada prior to this period, it will be necessary to communicate any changes to the recommendations for case management now that the pandemic virus has arrived in Canada.

Recommendations for Management of Individuals with ILI (presumed novel/pandemic flu):

Pandemic Period: Localized or widespread activity occurring in Canada – Phase 6.2

Indicator: Sustained transmission of the virus resulting initially in clusters followed by localized and widespread activity in the general Canadian population.

- As case numbers increase, liaise with the group that is in charge of the pandemic response in your jurisdiction to put into effect the sections of the Plan that apply to clinical care (e.g. coordinate patient flow to appropriate sites or settings).
- Switch from reporting individual cases to reporting broad indicators of pandemic impact, (e.g. activity level, hospitalizations) as per surveillance guidelines.

⁸ The case should be given instructions about infection control measures to be implemented if they must leave their home to visit a health care provider (e.g. phone ahead, wear a mask).

- Provide public messaging⁹ on self-care (including isolation), reporting of illness, where, when and how to present for medical assessment, and the availability of limited resources (discontinue individual-focused active surveillance).
- Determine the duration of isolation for ill individuals cared for outside of a health care facility,¹⁰ based on the epidemiological data available at the time.
 - In the absence of data on period of communicability for the novel virus, isolate patients until 24 hours after their symptoms have resolved.¹¹
 - Except when visiting a health care provider, these individuals should stay at home during this time and avoid close contact with unexposed household members (unless an alternative diagnosis is established).
 - Consider extending this isolation period for immunocompromised patients or children who are more likely to have prolonged viral shedding.
- It is expected that antiviral drugs from the National Antiviral Stockpile will be used for treatment of all persons with influenza-like illness (presumed pandemic influenza) who are ill enough to need care, and who are assessed within 48 hours of the onset of symptoms. (See Annex E for additional details on antivirals.)
- If cases have occurred in Canada prior to this the period, it will be necessary to communicate any changes to the recommendations for case management now that the pandemic virus has arrived in Canada.
- As case numbers decrease at the end of a pandemic wave:
 - A more individualized focus may be possible including individual case reporting and management (refer to the recommendations for Canadian Phase 6.1 under section 5.1.3 in this annex), and
 - Consideration should be given to evaluating the implemented case management strategies in order to optimally inform the response to any additional waves or pandemics.¹²

5.2 Goals and Anticipated Outcomes

- Cases will have knowledge about how to reduce disease transmission.
- Reduced opportunity for transmission of the novel virus
- Possible containment of an inefficiently spread virus or delayed spread of the pandemic virus
- Documentation and reporting of ill individuals meeting surveillance case definitions
- A well-integrated case-management system that adapts as the situation evolves

⁹ The focus on individual case management will need to change because it will not be sustainable when the number of cases increases in the local community. During the WHO consultation, it was recognized that “as levels of morbidity and mortality mount during a pandemic, measures that made good sense at earlier phases – such as isolation of patients, contact tracing and voluntary quarantine... would cease to be effective or feasible because of the large number of cases.”⁽⁹⁾

¹⁰ Patients in a health care facility should be managed according to infection control recommendations provided at the time. This recommendation acknowledges that public health may need to recommend a period of isolation for cases remaining in the community (i.e. home setting).

¹¹ At the time of the pandemic, it may be necessary for essential workers to return to work during their convalescent period while they may still be communicable. In this situation, the appropriate public health authority may make recommendations for these individuals to minimize the possibility of transmission (e.g. wear a mask when in public settings).

¹² Evaluative studies would not need to be implemented in all jurisdictions. To obtain rapid feedback, consideration should be given to coordinating these efforts. For example, different jurisdictions or sites might be asked to examine different aspects of the response.

5.3 Rationale

Isolation of cases early in the Pandemic Alert Period or early Pandemic Period in Canada may prevent secondary cases or slow the spread of the illness within the population.¹³ This may also prevent or reduce disruption of the health care system by “flattening” the epidemic curve, i.e. reduce the demand for health care services from a short intensive outbreak to a more manageable level of demand over a longer period. This could also help reduce societal disruption and potentially buy time for vaccine manufacture and administration, thus mitigating the effects of the pandemic in the community as a whole.

Scrupulous hand and respiratory hygiene may decrease transmission of the virus, especially if the method of transmission is primarily droplet spread.

Treatment of individuals with presumptive novel or pandemic influenza who present within 48 hours of symptom onset (the period during which neuraminidase inhibitors are known to be most effective in terms of improving clinical outcome) is expected to reduce the duration of symptoms, rate of complications, and potentially decrease the period of communicability.¹⁴ Recognizing that during the Pandemic Alert Period the number of cases will be limited, most cases should be able to be accommodated in hospital settings where infection control procedures are likely more consistent and rigorous compared to the home setting.

Individual case management early in the pandemic will facilitate the collection of epidemiological data that could be used to characterize how the virus presents in Canada. Ongoing evaluation of the epidemiological data from individual cases and comparisons with information from other affected countries may help focus control efforts.

Timely reporting of cases or broad indicators of pandemic impact¹⁵ will enable public health authorities to track the progression of the pandemic throughout Canada. This will inform decision-making about all aspects of the response plan, including the allocation of limited supplies, effectiveness of surveillance and public health control measures, and it will facilitate consistent communication with all stakeholders including the public.

5.4 Feasibility and Requirements

Containment, if possible, will require the timely identification and immediate isolation of cases. Access to sufficient rapid tests for influenza A and subtyping results will help focus the intense efforts that are expected to be implemented should cases be identified in Canada prior to the onset of the global Pandemic Period (Phase 6). A laboratory-testing protocol that is endorsed by all involved parties will increase the feasibility of this intervention.

Basic hand and respiratory hygiene should always be facilitated by ensuring access to adequate supplies and equipment for all cases regardless of where they are cared for during their illness, (e.g. access to soap and running water or alcohol-based hand sanitizers). The availability of isolation rooms in hospitals will quickly become an issue, and it is likely that the establishment of dedicated wards or facilities will be necessary. As the pandemic progresses and hospitals reach

¹³ If cases occur in Canada prior to the virus gaining the ability to be transmitted efficiently from human to human, aggressive measures and treatment may lead to containment.

¹⁴ If during the Pandemic Alert Period a novel virus is causing severe disease, and data suggest that treatment initiation beyond the first 48 hours of symptoms is beneficial, this recommendation will be reviewed and changed as necessary.

¹⁵ It is assumed that the surveillance protocol will be followed as much as possible. It will likely be necessary to switch to “broad indicators,” such as hospitalizations, clinic attendance or all-cause mortality, because tracking individual case counts will not be feasible beyond the earliest stages of the pandemic. (See Annex N for details regarding surveillance)

capacity, satellite or non-traditional health care sites may need to be established to deal with the increased demand.¹⁶

Keeping up with reporting requirements will require a dedicated team with pre-established communication protocols. Ideally, electronic databases with Web-based reporting will make this task more efficient. To effectively use broad indicators of pandemic impact, baseline data on these indicators should be collated at the local or regional level during the Interpandemic Period.

5.5 Impacts and Stakeholders

Prior to pandemic activity in Canada, laboratories will be greatly affected by increased demands for influenza testing. (See Annex C, Laboratory Procedures, for recommendations during the Pandemic Alert Period and the Pandemic Period.)

When the activity level increases, the major impact will be on health care facilities with respect to demands for isolation rooms and wards, isolation supplies and the potential availability of staff to care for patients who may require intensive care. At a minimum, more staff time may be needed because of the requirements for isolation procedures.

Isolation at home will affect not only the patient but also the entire household because special precautions are recommended to minimize transmission in these settings (see section 6 below, Management of Contacts of Cases).

Increased reporting requirements and the need for ongoing updates on patient status (especially at the beginning of the pandemic when it is important to characterize the epidemiology of the pandemic in Canada) will impact both primary health care settings and public health authorities.

5.6 Anticipated Compliance and Acceptability

If cases are detected in Canada prior to evidence of the efficient spread of the virus, compliance with isolation and infection control recommendations may vary and likely will be linked to the observed severity of illness in cases occurring at that time. If cases have already occurred elsewhere in the world, familiarity with the existence and outcomes of those cases may also affect compliance.

As public awareness of pandemic activity outside of Canada increases, there probably will be an increased expectation to protect the health of Canadians. Isolation of ill individuals as a control strategy will likely have high public acceptance, especially if the novel virus is causing severe illness and deaths. The potential effectiveness and role of scrupulous hand and respiratory hygiene in limiting the spread of the novel virus should be emphasized. The general public may perceive these basic “low-tech” measures as insufficient and therefore compliance may be less than optimal. With proper emphasis and consistent messaging by public health authorities, these basic measures, which include covering the mouth when coughing and frequent handwashing, could become so ingrained that it would be “socially unacceptable” to ignore them.

Compliance among isolated individuals will likely vary with severity of the illness and their perception of whether or not they are infected with the pandemic virus. Personal situations (e.g. the tolerance of employers and/or compensation available) may also affect compliance.

¹⁶ The National Emergency Stockpile System (NESS) has approximately 33,000 beds and cots that are available in the 165 to 200 mobile hospitals and that can be requested through the NESS system.

Orders issued by public health officers or even the courts for isolation may be necessary in some situations; however, this “individual-focused” intervention likely could not be sustained beyond the earliest stages of the pandemic.

If the pandemic spreads to the degree that a community is severely affected and resources are exhausted, it is possible that self-isolation within the home, regardless of severity of illness, will gain acceptance as a control strategy.

6.0 Management of Contacts of Cases

This section includes recommendations for the public health management of contacts of suspected or confirmed cases. For the purposes of this document, a “contact” is someone with face-to-face exposure within 1 metre of a case. The duration of a significant exposure is unknown; therefore, exposures will need to be considered as part of the risk assessment. Follow-up of contacts is expected to be more aggressive during the Pandemic Alert Period and possibly at the earliest stage of the Pandemic Period before public health resources are overwhelmed. This activity is expected to become less focused toward individuals as the pandemic progresses, with messages for contacts being conveyed primarily by public education campaigns as public health resources are re-directed towards other control strategies.

6.1 Recommendations

- Health care workers who are contacts of cases due to occupational exposure should follow the directions provided by the occupational health and/or infection control departments within their facilities.
- Risk assessments should be performed to ensure that the recommendations included in this document are tailored to suit the specific situations, particularly prior to declaration of a pandemic (e.g. if the predominant clinical presentation is conjunctivitis, as opposed to more severe illness, then recommendations for activity restriction of close contacts may not include quarantine).
- All contacts of cases should be provided with information (in a format that takes into consideration literacy levels and language preferences) on:
 - personal protective measures (e.g. handwashing),
 - symptoms of ILI,
 - what to do if they develop symptoms (i.e. who to call and when),
 - how to seek medical attention for any reason, and
 - objectives and expectations with respect to any activity restrictions.
- Encourage contacts and members of their households to practice good hand and respiratory hygiene (e.g. frequent handwashing, covering mouth when coughing, etc.) and to frequently clean and then disinfect household surfaces that could be potentially contaminated, particularly during the 3 days following last exposure to a case.

- If a contact of a case develops one or more symptoms compatible with influenza, then they should be managed as per section 5, Public Health Management of Individuals with Influenza-like Illness, in this annex.
- Any use of antivirals for post-exposure prophylaxis during the Pandemic Alert Period should ideally be monitored with outcomes (break-through infection and any adverse events) being reported to the appropriate public health authority.
- As the number of cases and contacts increases, consider setting up telephone “hot-lines” and/or designated assessment clinics.

Recommendations for Management of Contacts of Cases

Pandemic Alert Period: Sporadic activity in Canada – Phase 3.1

Indicator: Single human case(s) with a novel virus subtype in the Canadian population, with no spread, or at most rare instances of spread to a close contact only. Outside of Canada, sporadic cases may be occurring with no spread, or at most rare instances of spread to a close contact only.

Monitoring	<ul style="list-style-type: none"> ▪ Trace contacts of cases and monitor for symptoms of illness for 3 days after last exposure to the case or for the duration of the incubation period associated with the novel virus, whichever is longer. ▪ Monitoring for illness may be passive (i.e. contact is encouraged to self-monitor and report any illness) or active, with or without activity restrictions, depending on the specific situation and the discretion of the local medical officer of health.
Activity Restriction	<ul style="list-style-type: none"> ▪ Consider advising contacts to defer travel to unaffected areas for duration of monitoring period.
Antiviral Use	<ul style="list-style-type: none"> ▪ Do not routinely offer post-exposure prophylaxis with antiviral drugs to household members and other close contacts of human cases in the absence of any suspected human-to-human transmission; however, consider this strategy in severe or unusual cases or when limited human-to-human transmission cannot be ruled out.^{17,18}

Recommendations for Management of Contacts of Cases

Pandemic Alert Period: Sporadic activity in Canada – Phase 4.1 and Phase 5.1

Indicator: Single human case(s) with a novel virus subtype in the Canadian population. Outside of Canada clusters resulting from human-to-human transmission are occurring but the virus has not demonstrated the efficiency of transmission necessary to cause a pandemic.

Monitoring	<ul style="list-style-type: none"> ▪ Trace contacts of cases and implement active surveillance for symptoms of illness for 3 days after last exposure to the case or for the duration of the incubation period associated with the novel virus, whichever is longer.
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¹⁷ This precautionary measure is intended to reduce the risk that a contact of a case transmits the infection when it is unclear whether human-to-human transmission is occurring.⁽¹⁾

¹⁸ See reference (3) under References for additional recommendations regarding contacts of non-human cases of novel (avian or animal) influenza.

Activity Restriction	<ul style="list-style-type: none"> ▪ If contacts are promptly identified (i.e. within the incubation period), quarantine them or at a minimum ask them to restrict contact with others for 3 days after last exposure to the case or for the duration of the incubation period, whichever is longer. ▪ Recommend that contacts refrain from travelling for duration of monitoring period.
Antiviral Use	<ul style="list-style-type: none"> ▪ Consider use of antivirals for post-exposure prophylaxis, depending on the resistance status of the novel virus.¹⁹

Recommendations for Management of Contacts of Cases

Pandemic Alert Period: Localized or widespread cluster activity in Canada – Phase 4.2

Indicator: Small localized cluster(s) occurring in Canada with “limited” (Phase 4) pandemic risk based on various factors, e.g. rate of transmission, geographic localization and spread, severity of illness, impact of control measures, presence of genes from human strains (if derived from an animal strain), other information from the viral genome and/or other scientific information.

Monitoring	<ul style="list-style-type: none"> ▪ Aggressively trace contacts of cases and implement active surveillance for illness in these individuals.
Activity Restriction	<ul style="list-style-type: none"> ▪ If contacts are promptly identified for the cases (i.e. within the known or expected incubation period), quarantine these individuals or at a minimum ask them to restrict their contact with others for a period of 3 days after last exposure to the case or for the duration of the incubation period associated with the novel virus, whichever is longer. ▪ Recommend that contacts refrain from travelling for the duration of monitoring period.
Antiviral Use	<ul style="list-style-type: none"> ▪ Consider the use of antiviral drugs for post-exposure prophylaxis of close contacts, depending on the resistance status of the novel virus. ▪ Public health authorities will likely coordinate the distribution of antivirals for this purpose; this strategy will be used in the Pandemic Alert Period in an attempt to control the spread of the novel virus. ▪ Discontinue this strategy once a pre-determined trigger (e.g. detection of community spread) is met or the supplies dedicated for this early control/containment strategy are exhausted²⁰.

Recommendations for Management of Contacts of Cases

Pandemic Alert Period: Localized or widespread cluster activity in Canada – Phase 5.2

Indicator: Cluster(s) occurring in Canada with “substantial” pandemic risk based on various factors, e.g. rate of transmission, geographic localization and spread, severity of illness, impact of control measures, presence of genes from human strains (if derived from an animal strain), other information from the viral genome, and/or other scientific information).

¹⁹ The decision to quarantine would be based on the risk assessment, which takes into consideration the specifics of the situation(s), including the severity of illness and the pandemic potential of the virus.

²⁰ At this time a decision regarding any prophylaxis indications for the Pandemic Period, including post-exposure prophylaxis of close contacts, has not been reached and the size of the national stockpile has not been increased to accommodate this or any other prophylaxis indications.

Monitoring	<ul style="list-style-type: none"> ▪ Aggressively implement protocols for influenza case and outbreak management as long as possible²¹ with consideration of the recommendations for infection control in Annex F²². ▪ Assessment of exposure may involve identifying possible exposure sites (e.g. schools, workplace) rather than trying to identify individuals that were in close contact with the case. ▪ If feasible consider active surveillance for close contacts of the case(s). ▪ Facilitate and encourage self-monitoring for ILI for individuals linked to possible exposure sites but with unknown exposure to the case(s). ▪ Provide the necessary instructions and resources to permit those who are self-monitoring to report of any early signs of ILI immediately (24 hours/day, 7 days/week) and to receive instructions regarding isolation and medical management.
Activity Restriction	<ul style="list-style-type: none"> ▪ Quarantine close contacts and individuals linked to the exposure sites or at a minimum ask these individuals to restrict their contact with others for a period of 3 days after last exposure to the case or for the duration of the incubation period associated with the novel virus, whichever is longer. ▪ If not quarantined, recommend that contacts and individuals linked to exposure sites refrain from travelling for the duration of monitoring period.
Antiviral Use	<ul style="list-style-type: none"> ▪ Consider the use of antiviral drugs for post-exposure prophylaxis of close contacts, depending on the availability of the drugs and resistance status of the novel virus. ▪ Public health authorities will likely coordinate the distribution of antivirals for this purpose; this strategy will only be used in the Pandemic Alert Period in an attempt to control the spread of the novel virus. ▪ Discontinue this strategy once a pre-determined trigger (e.g. detection of community spread) is met or the supplies dedicated for this early control/containment strategy are exhausted.²³

Recommendations for Management of Contacts of Cases

Pandemic Period: Sporadic activity in Canada – Phase 6.1

Indicator: Single human case(s) with the pandemic virus detected in Canada. No cluster(s) identified in Canada.

Note: If the incubation period, period of communicability and method of transmission for the novel strain is consistent with other known influenza strains, it is likely that this phase will have a very short duration and may not occur at all in Canada (i.e. novel virus activity may not be detected prior to the occurrence of a cluster of cases).

²¹ It is recognized that individual case management by public health authorities will not be sustainable and, depending on the geographical distribution of cases, may need to be discontinued before the Pandemic Period in jurisdictions that are heavily impacted during the Pandemic Alert Period.

²² For example, this may include triage and provision of surgical masks to patients with respiratory illness presenting for a medical assessment (when pandemic influenza cases have already occurred in the specific community).

²³ At this time a decision regarding any prophylaxis indications for the Pandemic Period, including post-exposure prophylaxis of close contacts, has not been reached and the size of the national stockpile has not been increased to accommodate this or any other prophylaxis indications.

Monitoring	<ul style="list-style-type: none"> Identify possible exposure settings and instruct all close contacts of the case(s) and individuals linked to the exposure setting (e.g. passengers on same flight) to self-monitor for early signs of ILI for 3 days after last exposure to the case or for the duration of the incubation period associated with the novel virus, whichever is longer. Provide the necessary instructions and resources to permit those who are self-monitoring to report of any early signs of ILI immediately (24 hours/day, 7 days/week) and to receive instructions regarding isolation and medical management.
Activity Restriction	<ul style="list-style-type: none"> Educate known and potential contacts of cases about the period of communicability for influenza and the need to isolate themselves immediately should they start to develop signs of ILI. Discourage travel during the self-monitoring period.
Antiviral Use	<ul style="list-style-type: none"> At this time a decision regarding any prophylaxis indications for the Pandemic Period, including post-exposure prophylaxis of close contacts, has not been reached and the size of the national stockpile has not been increased to accommodate this or any other prophylaxis indications.

Recommendations for Management of Contacts of Cases

Pandemic Period: Localized or widespread activity in Canada – Phase 6.2

Indicator: Sustained transmission of the virus resulting initially in clusters followed by localized and widespread activity in the general Canadian population.

Monitoring	<ul style="list-style-type: none"> As the number of cases and subsequent contacts increases, advice to contacts should be incorporated in messages directed to the affected community as a whole. Provide guidance on how to monitor for signs of ILI (e.g. recording temperature or identifying respiratory symptoms). Contact follow-up may intensify in order to identify the end of a pandemic wave when pandemic activity appears to be declining.
Activity Restriction	<ul style="list-style-type: none"> If quarantining of contacts was previously implemented, consider discontinuing this practice during this phase, i.e. when the virus is known to be efficiently spreading from human to human and resources might be better allocated for other activities.
Antiviral Use	<ul style="list-style-type: none"> At this time a decision regarding any prophylaxis indications for the Pandemic Period, including post-exposure prophylaxis of close contacts, has not been reached and the size of the national stockpile has not been increased to accommodate this or any other prophylaxis indications.

Post-Pandemic Period

Indicator: Reports of cases counts and other broad indicators of pandemic activity in Canada suggest that the pandemic virus is no longer causing significant illness in the population.

- Consider evaluation activities that examine the effectiveness of the contact management strategies employed during the pandemic wave(s).

6.2 Goals and Anticipated Outcomes

- Identification of infected contacts of cases prior to their becoming communicable
- Early detection of additional cases, decreasing interval between onset of communicability and isolation
- Potential limitation of spread or slowing of the spread
- People in close contact with cases will have the knowledge about how to reduce the possibility of further exposure to the virus.
- Gain knowledge about the impact of implemented strategies

6.3 Rationale

If outbreaks occur in Canada while transmission of the virus is still relatively inefficient (i.e., during the Pandemic Alert Period), containment may be possible if prompt and effective contact management, including activity restriction and quarantine, and potentially the prophylactic use of antiviral drugs can be implemented.

Ensuring that those individuals who are known to have had contact with a case are appropriately monitored and informed about whom to contact should they become symptomatic will facilitate early case detection and early antiviral treatment. At the start of the pandemic, epidemiological data available from these early cases will be helpful in characterizing the pandemic activity and epidemiology in Canada. This information will further inform the response, especially interventions requiring the identification of high-risk groups.

Because supplies of antiviral drugs may be limited for the containment strategy, targeted use is recommended for contacts of the first cases identified in an area during the Pandemic Alert Period when human-to-human transmission is known to be occurring. This attempt to decrease spread of the virus will likely have limited application because it will not be operationally feasible once widespread community transmission occurs.

The public health authority is responsible for providing information on how to manage any potential illness in contacts of cases or members of their households and on how to reduce the chance of viral infection. By doing so, individuals (and the community as a whole) will perceive the public health authority as an engaged partner in this health care crisis and a credible presence in any future public health interventions (especially with regard to potentially less popular strategies that may involve prioritizing limited supplies).

6.4 Feasibility and Requirements

The use of quarantine is not anticipated to be as effective for influenza compared with other diseases with longer incubation periods. But if cases and clusters occur in Canada prior to the onset of the pandemic, it will be essential to implement restrictions on activities in order to try to contain the outbreak(s). This intervention will be most successful if the cases and subsequently their contacts are identified very quickly after onset of illness in the case and if the novel strain is not being efficiently transmitted among humans (as in the Pandemic Alert Period). Given these caveats, the use of individual quarantine measures should be employed at the discretion of the local public health authority and only when appropriate resources can be allocated to this effort.

Quarantining contacts will require extensive public health resources; its success as a containment and control strategy is contingent on thoroughness of contact tracing, rapid implementation and ongoing monitoring. These efforts will not be sustainable beyond the Pandemic Alert Period and, depending on the size of the outbreaks, they may need to be discontinued during the Pandemic Alert Period (i.e., prior to Phases 6.1 and Phase 6.2 in Canada).

Providing information to contacts will be done initially on an individual basis by fact sheets or telephone advice. This will require trained staff who have access to the list of contacts that have been generated by the case investigation process. This approach may be feasible early in the pandemic, but it will quickly need to change to a more efficient population-based strategy (see section 3, Public Education, in this annex).

The availability of antiviral drugs and dedicated human resources will dictate the feasibility of implementing post-exposure prophylaxis for contacts of cases. Public health authorities will likely be involved in overseeing that drugs are dispensed to the targeted individuals.

Due to the epidemiology of influenza (e.g. the possibility of transmission prior to onset of symptoms), it would be extremely difficult to evaluate how the contact management strategies will affect pandemic activity in any one community. However from a resource management perspective, it may be worthwhile to examine how resources are allocated for the purpose of contact management and whether any changes can be made to these strategies to improve the efficiency of the overall pandemic response.

6.5 Impacts and Stakeholders

The occurrence of a case will immediately increase the number of “stakeholders” because contacts of the case will be seeking advice on the mitigation of personal risk. The local public health authority may be overwhelmed with inquiries and the need to collect information on contacts soon may be superseded by other priorities. For educational and communication purposes, the entire population should be considered potential contacts of a case in this situation.

6.6 Anticipated Compliance and Acceptability

If cases are detected in Canada prior to evidence of the efficient spread of the virus, compliance with quarantine and infection control recommendations may vary and likely will be linked to the observed severity of illness in cases occurring during that time.

In light of the SARS experience of 2003 where contacts of cases were notified and monitored by local public health authorities throughout the outbreak(s),⁽⁵⁾ the public may not understand why contacts of the novel influenza cases may not be notified and put into quarantine or why this strategy may be employed only at the start of activity in Canada. A proactive education campaign may increase acceptability of the proposed recommendations, which exclude routine quarantine during the Pandemic Period. It is important to recognize and be prepared to deal with individuals who choose to self-quarantine or other institutions (e.g. schools, workplaces) that may implement their own quarantine rules.

If antiviral drugs are initially made available for contacts of the first cases in a particular jurisdiction, it will be difficult to discontinue this intervention when it is no longer feasible or effective from a population perspective or if it is not a recommended use of antivirals from the national stockpile during the Pandemic Period. The public will need to be informed in advance about strategies for the availability of antivirals and reasons for these strategies. This information will facilitate the

acceptance of public health decisions that focus on the main objective of reducing the overall number of cases and deaths. Two concepts will need to be addressed by educational and risk-communication messaging to optimize compliance and facilitate acceptance to public health decisions; these are that certain public health measures will need to change as the pandemic evolves and that the use of the drugs in the national stockpile has been based on national-level decisions to facilitate equitable access and optimal usage across Canada.

Evaluation activities may be more successful if they are coordinated to ensure that selected sites examine specific issues, thus potentially reducing duplication of effort and the need for all sites to participate. This approach may improve the acceptability of evaluation activities among health authorities in jurisdictions that are still recovering from the pandemic.

7.0 Community-Based Disease Control Strategies

Controlling the spread of influenza in the community likely will not be possible without an effective vaccine, assuming that the novel virus will cause illness with similar characteristics to other influenza A infections. Specifically, the short incubation period, high infectiousness, ability of the virus to survive for extended periods of time on environmental surfaces, non-specific clinical symptoms, and potential for asymptomatic infection and spread from asymptomatic individuals greatly limits the effectiveness and feasibility of most traditional public health control measures. During the SARS outbreak, no vaccine or virus-specific drugs were available for treatment or prophylaxis; therefore, the need to effectively isolate communicable cases and identify and quarantine their respective contacts became paramount. A recent modeling exercise concluded that influenza would be “difficult to control even with 90% quarantining and contact tracing because of the high level of presymptomatic transmission.”⁽⁶⁾

Because the potentially high attack rate of a novel virus in the general population will stretch all existing health care resources, ideally planners should consider dedicating resources only to measures that will effectively mitigate the impact of the pandemic. Unfortunately most community-based measures under consideration, including the widespread use of masks, cancellation of public gatherings and closure of schools and businesses, have been anecdotally reported to be ineffective, or their effectiveness has not been formally evaluated. The use of mathematical modeling to predict the potential effectiveness of these types of interventions may provide estimates of their impacts that will help in the development of future planning documents.

Despite the absence of data on effective measures, it is recommended that the conclusions related to the measures or actions described below should be considered when planning for a pandemic. These recommendations are based mainly on expert opinion and are intended to facilitate a consistent approach. They are not intended to supersede the implementation of any measures that may be directed by P/T authorities.

The triggers for the following measures will depend both on the measure and on the way the pandemic unfolds. In general, decisions about implementing these measures will likely be made by the local public health authority (i.e. Medical Officer of Health). However, it is recognized that directions may also be forthcoming from the P/T or regional levels to ensure the consistency of a broad-based approach.

7.1 Strengthen Recommendations to Stay Home from Public Events and Locations (i.e. Self-Isolate) If You Have Fever and New Onset of Respiratory Symptoms²⁴

Trigger

- Arrival of one or more confirmed cases in the P/T. Local authorities should reinforce this recommendation when cases occur in their jurisdiction.

Advantages

- Potential to decrease the number of people exposed to an ill person and therefore decrease (or delay) the spread of disease
- Easy to implement as a “recommendation for the public”
- Likely to have high public acceptance

Disadvantages

- Compliance will vary and will not be measurable (therefore effectiveness will not be quantifiable)
- May result in unnecessary absenteeism among essential workers because, based on the non-specific symptoms, individuals ill due to other causes will end up staying home
- Potential expectation for public health authorities to provide resources to “enforce” the recommendation

Conclusion

This measure is sensible, feasible and easy to implement from a public health perspective. Despite being potentially disruptive to businesses and society as a whole, it may delay the spread of the disease within the community. This “flattening out” of the epidemic curve is beneficial because it may reduce the demand for health care services on any particular day or week and result in a high but manageable level of demand over several weeks instead.

- Strongly recommend implementation

7.2 Close Schools and Daycare Centres

Trigger

Declaration of one or more confirmed cases in the local community by the local public health authority (i.e. confirmation of pandemic presence), depending on the epidemiological context (i.e. extent to which these settings are expected to contribute to transmission based on observed age of cases, etc.). It is not necessary or desirable to wait until spread in these settings is demonstrated.

²⁴ Individuals with chronic respiratory conditions should consider staying home if they have onset of fever and an exacerbation of respiratory symptoms.

Advantages

- Children are known to be efficient transmitters of influenza; closing schools and large daycare facilities may reduce transmission or delay spread of the disease (in this age group and in younger siblings, parents and close contacts of school and daycare attendees).
- Most public health authorities have the legal authority to implement this measure and have a working relationship with school boards.

Disadvantages

- Alternate arrangements will need to be made for child care which may lead to “gatherings” of children outside of the school setting thus contradicting the intended benefit of the school closure.
- Only applies to school-age children and children attending large daycare facilities
- Essential workers might be diverted to child-care responsibilities.

Conclusion

This measure is feasible and would be most effective if the pandemic was causing high attack rates in pre-school or school-age children. It is recognized that school boards or daycare administrators may choose to independently close their facilities regardless of the epidemiology of the pandemic. The Working Group recommends this measure as a key consideration for decreasing transmission of influenza in a community.

- Recommend implementation be considered

7.3 Restrict Indoor Public Gatherings (other than schools)

(e.g. close theatres and other venues where large amounts of people gather indoors in close proximity, halt mass public transportation services)

Trigger

When the local public health authority indicates that transmission is occurring within the community²⁵

Advantages

- Decreases the number of venues in which spread to a large number of people is possible

Disadvantages

- May feed public panic and cause societal disruption
- Negative economic impact on business owners (may generate compensation claims)
- Sustainability for the duration of the pandemic wave may be problematic, especially when the pandemic activity is widespread.

²⁵ These types of measures would be likely be most effective prior to cases with transmission occurring in the community. However in the absence of disease, it would be difficult to justify this type of drastic measure for which there is no sound data for its effectiveness.

Conclusion

This type of measure may be feasible but compliance and sustainability might be difficult, especially because effectiveness is unproven. This is particularly true for gatherings and activities that are considered “essential” (e.g. public transportation) and would cause significant societal disruption should they be discontinued.

If the epidemiology of the pandemic suggests higher morbidity and/or mortality in a specific group of individuals (e.g. adolescents), then canceling events known to attract this specific high-risk group should be considered, especially if the virus is being efficiently transmitted. The objective of these targeted cancellations or restrictions would be to avoid a sudden increase in demand for health care services as a consequence of a “spike” in cases due to efficient transmission at a large gathering.

Once the virus is circulating in a community, indoor gatherings at events or at locations for businesses may be suspended without public health intervention because of public reluctance to participate in large gatherings. Because the effectiveness of this measure is unknown and it may be difficult to sustain, the Working Group does not recommend its broad implementation. However, it is recommended that those who are involved in hosting large gatherings ensure the availability of hand-sanitation supplies in public washrooms.

- Not recommended for broad implementation
- Consider if high-risk gatherings can be identified

7.4 Use of Masks by Well Individuals

Trigger

Declaration of the arrival of one or more confirmed cases in the local community by the local public health authority

Advantages

- May decrease exposure to large droplets containing virus
- Psychologically reassures people that they are taking measures to prevent infection

Disadvantages

- Hands and other surfaces may be contaminated when mask is removed (requires public education).
- May cause panic if the availability of masks is limited
- Public purchase of masks may limit the availability of masks in health care settings where they are required.
- Not all members of the public can afford to purchase masks. If recommended by public health authorities, there could be an expectation that they will be publicly funded and provided by public health programs.
- It is not feasible to wear masks constantly for the duration of pandemic wave.
- Use of masks, apart from other infection control practices, is of limited effectiveness and may provide a false sense of security.

Conclusion

This measure is not feasible or sustainable on a population basis. It is not likely to be effective in reducing disease spread in the general population and therefore is not recommended as a community-based strategy. It is acknowledged that individual people who are wearing a recommended mask properly at the time of an exposure may benefit from the barrier that a mask provides. The WHO has recommended that mask use by the public should be based on risk, including frequency of exposure and closeness of contact with infectious persons and suggests that based on this risk assessment use of masks in crowded settings such as public transit may be justified.⁽⁷⁾ At the time of a pandemic, however, when the virus is circulating in the community it will not be possible for public health authorities to assess and compare risks of exposure in specific public settings (e.g., public transit, restaurants, recreational complexes). Therefore, members of the public may wish to purchase and use masks for individual protection; however, outside of known high-risk settings (e.g. a hospital with cases) this would not be an appropriate use of public resources.

Well individuals caring for cases in a non-traditional site or home setting should follow the recommendations provided by the Infection Control Working Group for individuals functioning in this capacity (see Annex F).

- Not recommended as a community-based intervention or measure

7.5 Implement Hand-Sanitizing Stations in Public Settings

(e.g. public transit settings)

Trigger

When the local public health authority indicates that transmission is occurring within the community

Advantages

- May increase frequency of handwashing and therefore reduce spread of disease
- Reinforces key message about handwashing

Disadvantages

- Effectiveness depends on public compliance
- Will not be effective against droplet spread via coughs and sneezes
- Requires human and financial resources to keep stations adequately supplied
- Potentially expensive to supply and maintain
- May give people a false sense of security

Conclusion

Frequent handwashing is an effective infection control measure when dealing with people known to be infectious. This measure is feasible, but maintaining these hand-sanitizing stations at the time of a pandemic would likely be possible only if the responsibility of supplying them could be assumed by organizations other than public health ones.

The effectiveness of public hand-sanitizing stations as a community-based strategy in a pandemic situation is unknown and would be largely influenced by public compliance, which could be highly variable, and the proportion of infectious individuals in public places at any given point in time. Therefore, this measure (i.e. the establishment of new sanitizing stations) is not considered to be effective for significantly reducing the spread of the disease in the general population. It is not recommended as a community-based strategy because of its anticipated minimal incremental benefit.

Public messaging about handwashing must be encouraged and existing public washrooms should be appropriately stocked with supplies at all times. However for the reasons previously stated and the difficulty in maintaining these stations at the time of a pandemic, the establishment of new hand-sanitizing stations in public settings is not considered to be an appropriate use of public resources.

- Not recommended as a community-based intervention or measure

7.6 Increase Frequency of Cleaning of Surfaces in Public Settings (e.g. public transit settings, large institutions, businesses)

Trigger

When the local public health authority indicates that transmission is occurring within the community

Advantages

- May remove viable virus from frequently touched surfaces and therefore reduce spread of disease
- Reinforces key message about mode of transmission and personal hygiene

Disadvantages

- Requires resources to maintain cleanliness
- Impossible to “target” cleaning efforts
- Efficacy depends on frequency and quality of cleaning (with appropriate supplies and techniques)
- Optimal frequency of cleaning cannot be determined and could be unsustainable during the peak of the epidemic in the community
- Potentially expensive

Conclusion

Environmental cleaning is most effective when dealing with surfaces associated with people known to be infectious. Increasing the frequency of cleaning is feasible, but identifying infectious individuals in public settings is not. The frequency of hand contact with various “public” surfaces would virtually require constant cleaning to have any effect on reducing the number of microorganisms on these surfaces. Realistically, this measure cannot be implemented; therefore, it is not recommended for broad use as a community disease containment strategy.

Individuals who may want to reduce their risk of exposure to infectious droplets may want to consider more frequent cleaning of their own environments and limiting hand contact with “public surfaces” (e.g. elevator buttons, public telephones).²⁶ These strategies could be included in public education messages.

- Not recommended as a community-based intervention/measure.

7.7 Other Measures NOT Recommended for Implementation

All of the measures or general principles addressed in this document were also raised during the WHO international consultation process (March 2004), as outlined in the meeting report.⁽¹⁾ The consensus was that the measures that follow were either not necessary or not appropriate. The Public Health Measures Working Group also agrees with these conclusions.

Measure	Comments
Urge entire population in an affected area to check for fever at least once daily	<ul style="list-style-type: none"> ▪ A potential measure to decrease interval between symptom onset and patient isolation; however, this has not been effective in other situations
Introduce thermal scanning into public places	<ul style="list-style-type: none"> ▪ Experience has not shown this measure to be effective
Widespread environmental or air disinfection	<ul style="list-style-type: none"> ▪ Not practical
Disinfect clothing, shoes or other objects of persons exiting affected areas	<ul style="list-style-type: none"> ▪ Not recommended for public health purposes ▪ May be required by veterinary authorities to prevent spread of infection in animals
Restrict travel to and from affected areas	<ul style="list-style-type: none"> ▪ Enforcement considered impractical in most countries ▪ Likely to occur voluntarily when risk is appreciated by the public
Cordon sanitaire	<ul style="list-style-type: none"> ▪ Enforcement considered impractical

8.0 Isolated Communities

Some of the community-based interventions and travel and border-related measures in this document might be more feasible for isolated communities than for heavily populated areas. This is because potential community-exposure sites may be identified more easily in isolated communities, and the movement of individuals can be monitored or possibly restricted. It has been anecdotally reported that during the 1918 and 1919 Spanish flu pandemic, small villages in Alaska that stringently restricted movement in and out of the village remained free of influenza. While this measure may not be possible in this day and age, there may be a greater potential in isolated communities than in more populated regions to delay the introduction of the pandemic strain until vaccines are available. Pandemic planners for these areas should consider engaging the residents in the planning process in order to investigate their potential support for these restrictive but potentially helpful early measures.

²⁶ During the 1918 and 1919 Spanish Flu pandemic, there are anecdotal reports that greeting by shaking hands was discouraged.

9.0 Travel and Border-Related Measures

An extensive list of public health measures that could be considered at the international level is addressed in the report from the WHO international consultation on this subject.⁽¹⁾ In general, entry screening for travellers from affected areas is not encouraged, with the exception of geographically isolated infection-free areas (e.g. islands) where it is considered to be potentially more feasible. There was consensus however on potential value of exit screening for all travellers from areas with human infection when human-to-human transmission was known to be occurring (i.e. starting in the Pandemic Alert Period, Phase 4 and Phase 5). This could be achieved by using health declarations and questionnaires, and possibly temperature screening, in combination with widespread messaging that recommends ill persons to postpone travel. Implementing “stop lists” (i.e. of isolated or quarantined persons) was considered feasible for certain countries, but generally it was not encouraged nor was medical examination for travellers at risk or with fever.

The following text is organized by pandemic period and phase. It is intended to document travel and border-related measures that may be implemented in Canada in response to the evolving pandemic whether it originates outside of Canada (i.e. International Origin) or inside of Canada (i.e. Domestic Origin). It is intended to provide guidance on potential P/T and local public health roles in travel and border-related measures.

International Origin: Canadian Pandemic Phase 3.0

Indicator: Human infection(s) with a novel virus subtype occurring in one or more locations outside of Canada, but little immediate pandemic risk (no spread, or at most rare instances of spread to a close contact only).

Advisories

A Travel Health Advisory will be posted on the PHAC Web site to inform travellers about the occurrence of human infections in specific international geographic regions and recommend personal health measures to reduce health risks. Advisories will recommend pre-travel medical consultation for individual risk assessment and post-travel medical assessment for illness that occurs during travel or develops on return.

Public health measures

- Be prepared to respond to news releases and travel health advisories posted on international and domestic public health Web sites (e.g. PHAC, WHO) informing travellers of the occurrence of human infection with a novel influenza virus²⁷ in a specific international geographic region.
- Provide updates to health care professionals to:
 - Raise awareness among health care professionals providing pre-travel consultations,
 - Increase awareness of the “travel” risk factors for infection with the novel virus among health care professionals assessing ILI in returning travellers, and
 - Ensure that the recommended surveillance measures, infrastructure and links are in place. (The Surveillance Section of the Plan, which is currently being developed for the next edition of the Plan, will contain specific recommendations.)
- Manage any cases from a public health perspective (see section 5, Public Health Management of Individuals with Influenza-like Illness, in this annex).

²⁷ This may have been preceded by media attention and alerts about outbreaks in avian or animal populations in which the public would be advised to avoid contact with possible sources of the virus (e.g. poultry farms, live animal markets).

Domestic Origin: Canadian Pandemic Phase 3.1

Indicator: Human infection(s) with a novel virus subtype in the Canadian population, but little immediate pandemic risk (no spread, or at most rare instances of spread to a close contact only).

Advisories

In collaboration, the Council of Chief Medical Officers of Health (CCMOH) and PHAC could post (on the PHAC Web site) a Travel Health Advisory informing Canadians about the occurrence of human infections in a specific domestic geographic area. This advisory would provide up-to-date and comprehensive information about any health risks and indicate whether or not there are recommendations not to travel to the affected geographic area, i.e. the area defined by the local or P/T public health authority where the case(s) occurred. Dissemination of the Travel Health Advisory beyond posting on the PHAC Web site would be dictated by both the CCMOH and PHAC. This could involve direct messaging to specific audiences (e.g. Canadian Medical Association) or to the media.

Public health measures

- Be prepared to respond to news releases and public health Web site postings (PHAC and WHO) that inform international travellers to Canada and the general Canadian public of the occurrence of human infection with a novel influenza virus²⁸ in a specific geographic region of Canada.
- Provide updates to health care professionals to:
 - Raise awareness among Canadian health care professionals who may be required to respond to their clients requests for information regarding their risks, should they be travelling to the affected geographic area in Canada;
 - Increase awareness of the travel-risk factors for infection with the novel virus among health care professionals who may assess persons with ILI who have visited or recently left the affected geographic area; and
 - Ensure that the recommended surveillance measures, infrastructure and links are in place. (The Surveillance Section of the Plan, which is currently being developed for the next edition of the Plan, will contain specific recommendations.)
 - Manage any cases from a public health perspective (see section 5, Public Health Management of Individuals with Influenza-like Illness, in this annex).

International Origin: Canadian Pandemic Phase 4.0, Phase 4.1, Phase 5.0 and Phase 5.1

Indicator: Cluster(s) occurring outside of Canada with “limited” (Phase 4.0) or “substantial” (Phase 5.0) pandemic risk based on various factors, e.g. rate of transmission, geographic localization and spread, severity of illness, impact of control measures, presence of genes from human strains (if derived from an animal strain), other information from the viral genome and/or other scientific information. Sporadic imported cases may or may not be occurring in Canada (denoted by Phase 4.1 and Phase 5.1).

²⁸ Ibid.

Advisories

Based on available information, either a Travel Health Advisory or a Travel Warning will be posted on the PHAC Web site to inform travellers about the occurrence of human-to-human transmission in a specific international geographic region(s) and to recommend deferral or delay of all non-essential travel to a specific destination. This may be targeted to readily identified groups who are potentially at very high risk or to all travellers, depending on the situation.

PHAC may consider disseminating public health messages by other means (e.g. posters, TV monitors, large video screens) at ports of entry. Provinces and territories will be notified about these decisions, and they will be consulted with regard to the content of messages that have implications about the provision of public and clinical health services in their jurisdictions.

Public health measures

- Manage any cases arriving or identified in Canada as specified under section 5, Public Health Management of Individuals with Influenza-like Illness, in this annex (also see “Screening logistics” below).
- Manage any contacts of cases as specified under section 6, Management of Contacts of Cases, in this annex (also see “Contact management logistics” below).
- P/T and local public health authorities need to consider how to manage travellers from affected areas who are advised to self-monitor for fever:
 - may initially involve direct public health follow-up and monitoring of contacts,
 - may involve designated phone lines for self-reporting by symptomatic travellers, and
 - may involve establishing local public health designated assessment sites that would be linked to public health surveillance activities.
- Ensure appropriate and timely dissemination of Travel Health Advisory and Travel Warning updates (may include further publicizing of the Web site).
- Provide latest outbreak information, guidance and support to government and non-government officials and the institutions they represent (for PHAC this would likely include port authorities, Canada Border Services Agency, the Royal Canadian Mounted Police and international air carriers)
- F/P/T and local public health authorities will need to collaborate on advance notification of the arrival of ill travellers, and assessing, releasing or detaining and transferring ill travellers for medical examination.
- PHAC will implement Traveller Contact Information Forms (TCIFs) if deemed necessary on appropriate air carriers:
 - initially at Customs, and
 - within 48 hours on selected air carriers.
- PHAC will distribute Health Alert Notices at points of entry to international returning travellers:
 - initially on debarkment, and
 - within 48 hours on selected air carriers.
- PHAC and P/Ts will consider implementing additional public educational materials (e.g. posters, TV monitors, video screens) at all arrival sites in ports of entry to reinforce the messages in Health Alert Notices

Screening logistics

Health assessments for arriving ill travellers will continue to be conducted as usual, under the authority of the Quarantine Act. Screening by thermal scanning, visual inspection or other means of all arriving international travellers or those arriving from specific geographical regions will not likely be considered. Participants at the WHO international consultation meeting did not consider such screening to be effective but rather to be “one example of a resource-intensive intervention that might nonetheless be introduced in response to public and political pressure.”⁽¹⁾

Contact management logistics

Contact tracing will be initiated for those arriving on international conveyances (i.e. airplanes, ships) with a confirmed case (or suspect case, as deemed necessary). The operational framework to access contact information of airline passengers will be left to the discretion of P/Ts.

Passengers could be directly contacted using the contact information collected from the flight manifest or from TCIFs if they have been filled out on air carriers. Alternatively, passengers could be contacted through public messaging by media sources.

If P/Ts chose to contact passengers directly, they will need to make a formal request that PHAC obtain the flight manifest or forward on the appropriate TCIFs for the flights of concern. To access the flight manifest, the PHAC will formally request passenger contact information from airline carriers and forward this information to the appropriate domestic and international public health officials so that they can contact individual travellers directly. To facilitate contact tracing of travellers, the TCIF system can be implemented on selected air carriers.

As the occurrence of clusters of cases continues or increases, contact tracing and notification will likely be conducted indirectly (passively) by public messaging rather than by actively attempting to directly contact each individual traveller. This transition to indirect tracing may occur in specific areas of Canada before the declaration of a pandemic, if these areas experience such a high level of activity during this alert period that the sustainability of available resources for this initiative becomes an issue.

Domestic Origin: Canadian Pandemic Phase 4.2 and Phase 5.2

Indicator: Cluster(s) occurring in Canada with “limited” (Phase 4.2) or “substantial” (Phase 5.2) pandemic risk based on various factors, e.g. rate of transmission, geographic localization and spread, severity of illness, impact of control measures, presence of genes from human strains (if derived from an animal strain), other information from the viral genome and/or other scientific information).

Advisories

In collaboration, CCMOH and PHAC may recommend postponement of all non-essential travel to an affected geographic area within Canada. This recommendation can be targeted to readily identified groups of travellers who are potentially at very high risk or to all travellers, depending on the epidemiological data available from the affected area.

Health Alert Notices can be distributed at points of entry to the affected area(s) by P/Ts. These notices will contain (i) outbreak information consistent with information provided in travel advisories and other formal communications, (ii) guidelines or a questionnaire for self-screening, and (iii) guidelines for reporting to health care professionals or other officials specified symptoms (e.g. fever) that start during the interval that is consistent with the observed or known incubation

period. Provinces and territories might consider disseminating similar public health messages at mass transit facilities that serve domestic travellers.

Public health measures

- Affected area: manage cases as specified under section 5, Public Health Management of Individuals with Influenza-like Illness, in this annex (also see “Screening logistics” below).
- Affected area: manage any contacts of cases as specified under section 6, Management of Contacts of Cases, in this annex (also see “Contact management logistics” below).
- P/Ts in collaboration with local public health authorities can implement exit screening at domestic airports serving affected areas within Canada. This may occur in collaboration with PHAC under delegated provincial authority or the Emergency Act
 - Increase public messaging regarding staying home, specifically not to travel when ill, and
 - Ensure directions for symptomatic individuals identified by the health declaration process at airports are clear and consistent with the local response to the pandemic activity.
- Unaffected areas: see “Contact management logistics” and “Screening logistics” below.
- P/T and local public health authorities not in an area experiencing a cluster(s) need to consider how to manage travellers from the affected area(s) who have not been specifically identified as contacts of a case:
 - may involve active or passive surveillance or designated phone lines for self-reporting by symptomatic travellers,
 - may involve designating assessment sites which would be linked to public health surveillance activities, and
 - ongoing appropriate and timely dissemination of Travel Health Advisory and Travel Warning updates and latest outbreak information in all areas.

Contact management logistics

Although identified cases are not expected to be circulating in public, contact tracing for any individuals arriving in an unaffected area on domestic conveyances (e.g. plane, bus, train) with a confirmed case (or suspect case, as deemed necessary) can be initiated. If initiated, P/Ts will formally request traveller contact information from domestic air carrier flights and forward all contact information on Canadian travellers to the appropriate domestic public health authorities for follow-up contact tracing activities. At the discretion of the provincial authority, PHAC may be asked to contact the air carrier and forward the appropriate information to all involved Canadian jurisdictions. Provinces and territories will need to forward all contact information on international travellers to PHAC who will forward it to appropriate international public health authorities.

In the unlikely event that short-term detention (1 to 3 days) of arriving travellers from a Canadian geographic area of risk proves necessary, P/Ts in collaboration with local public health authorities will take the lead in managing the event. At the discretion of the provincial authority, they may ask PHAC to provide this service.

As the occurrence of clusters of cases continues or increases, contact tracing and notification will likely be conducted passively by public messaging rather than by actively attempting to contact

individual travellers. This transition may occur before the declaration of a pandemic if increasing notifications make it non-sustainable.

Screening logistics

Provinces and territories could implement health assessments of ill travellers arriving on domestic flights that originate from affected area within Canada. Alternatively, P/Ts could request assistance from PHAC to implement these health assessments under delegated provincial authority.

Exit screening for all travellers from the affected areas within Canada (i.e. those experiencing clusters of human infection) would likely be implemented during this phase in the form of health declaration questionnaires.²⁹ This would likely be limited to those exiting the area by air travel.

At exit points (i.e. airports, sea ports, land border crossings) from the affected area(s) within Canada, modified versions of Health Alert Notices (or “health declarations”) containing (i) information about the outbreak consistent with information provided in Travel Health Advisories and other formal communications, (ii) a questionnaire for self-screening, and (iii) guidance for reporting specified signs of illness would likely be distributed. Additional screening methods aimed at detecting potentially infected individuals might also be considered at the directive of the CMOH and PHAC.

Pandemic Period: Canadian Pandemic Phase 6.0, Phase 6.1 and Phase 6.2

Indicator: Amplification and sustained transmission in the population

Advisories

During these phases, the wording of travel advisories may be strengthened to specifically recommend not traveling under any circumstances to affected areas. This may not be necessary if public demand for travel decreases and airline companies cancel service to certain areas.

While pandemic activity is increasing in Canada, actions implemented during the Pandemic Alert Period (Phase 4 and Phase 5) will quickly become unsustainable. Once widespread community transmission occurs in Canada, the allocation of resources targeted to keeping the virus out of the country will become unnecessary and resources should be re-allocated.

Public health measures

- Similar to the Pandemic Alert Period (Phase 4 and Phase 5) until no longer feasible or deemed to be ineffective due to widespread activity
- Public health measures directed toward travellers will likely be discontinued or scaled back at different times in different jurisdictions as the local epidemiology dictates.
- In subsequent waves of the pandemic, messaging and wording on health declarations and screening activities may need to be revised to take into consideration persons who were ill during the first wave and are now probably immune.

²⁹ Public or political pressure may result in the implementation of more visible interventions, such as thermal scanning or ear-temperature measurement. Note: Airlines also have a responsibility for disallowing obviously ill persons from boarding.

Post-Pandemic Period

Indicator: Reports of cases counts and other broad indicators of pandemic activity in Canada suggest that the pandemic virus is no longer causing significant illness in the population.

Advisories

Travel advisories would be revised as pandemic activity declines in various geographical areas. Public messaging may focus again on travellers as sources of infection if the wave has already moved through specific jurisdictions and community transmission is no longer being observed.

Public health measures

- May be similar to Pandemic Alert Period (Phase 3.1), i.e. focus on public and health care provider education as opposed to high levels of activity at airports
- Support recommended surveillance activities as per surveillance component of the Plan

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Summary of Recommendations

A.1 Case and Contact Management Summary

Canadian Pandemic Phase	Case Management	Contact Management
3.1	<ul style="list-style-type: none"> Isolate adults for 5 days (young children for 7 days) or until symptoms have resolved, whichever is longer (or period of communicability if known). Active surveillance for those isolated at home. Report individual cases. Facilitate laboratory testing. Early treatment with antivirals. 	<ul style="list-style-type: none"> Active or passive surveillance for symptoms for 3 days or duration of incubation period if known. Consider asking to defer travel for duration of surveillance period. Consider post-exposure antiviral prophylaxis for severe or unusual cases or when human-to-human transmission cannot be ruled out. Recommend annual flu vaccine.
4.1 or 5.1	<ul style="list-style-type: none"> As per 3.1 above 	<ul style="list-style-type: none"> Active surveillance for symptoms for 3 days or duration of incubation period if known. Quarantine or activity restriction to limit contact with others. Consider post-exposure prophylaxis with antiviral drugs.
4.2 or 5.2	<ul style="list-style-type: none"> As per 3.1 above Close off wards and restrict visitors if applicable. Report cases and clusters. 	<ul style="list-style-type: none"> As per 4.1 or 5.1 above. For 5.2, recommend self-monitoring for those linked to a possible exposure site (instead of individual-focused active surveillance).
6.1	<ul style="list-style-type: none"> As per 3.1 above 	<ul style="list-style-type: none"> Self-monitoring for symptoms. No quarantine. Consider deferring travel during self-monitoring period. Antiviral use as per national antiviral strategy for the Pandemic Period.
6.2	<ul style="list-style-type: none"> Isolate for 24 hours after symptom resolution or duration of period of communicability if known. Public messaging on self-care (including isolation), reporting of illness, where, when and how to present for medical assessment, and availability of limited resources (discontinue individual-focused active surveillance). Antiviral treatment for those presenting within 48 hours and for whom it is deemed medically necessary. 	<ul style="list-style-type: none"> As per 6.1 above. More public messaging. No quarantine.

A.2 Community-Based Disease Control Strategies

Recommended as a Community-Based Intervention	Not Recommended as Community-Based Intervention
<ul style="list-style-type: none"> ▪ Stay home from public events and locations (i.e. self-isolate) if you have fever and new onset of respiratory symptoms. ▪ Consider school and daycare closure. ▪ Restrict indoor public gatherings (other than schools) if “high-risk” settings can be identified. 	<ul style="list-style-type: none"> ▪ Broad restrictions on indoor public gatherings other than schools. ▪ Use of masks by well individuals (not including care-providers). ▪ Implement hand-sanitizing stations in public settings. ▪ Increase frequency of cleaning of surfaces in public settings. ▪ Urge entire population in an affected area to check for fever at least once daily. ▪ Thermal scanning in public places. ▪ Air disinfection. ▪ Disinfection of clothing, shoes or other objects of persons exiting affected areas. ▪ Actively restrict travel to and from affected areas. ▪ Cordon sanitaire.

Pandemic Influenza Surveillance Guidelines

Date of Latest Version: October 2006

Note:

- This is a new annex being released with the 2006 version of the Canadian Pandemic Influenza Plan.



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Preamble

Since 2004, Canadian public health surveillance stakeholders, through national working groups, have been defining the roles, responsibilities as well as the minimum standards for national surveillance data to be collected during interpandemic and pandemic periods.

The ability to adapt to rapidly evolving situations must be included in all surveillance guidelines. As such, the following annex is part of an ongoing and evolving preparedness plan. It is recognised that while the current published version outlines high level surveillance guidelines, further detail is required in order to provide comprehensive national guidelines, in particular, a more detailed description of streamlined surveillance activities for phase 6.

Therefore, the annex should be considered with the following list of next steps:

- Review of the sustainability of routine surveillance activities and consideration of options for streamlined surveillance which may include either greater focus on more reliable indicators or modification/simplification of routine activities during a pandemic
- Prioritize surveillance activities by phase
- Explore options and feasibility for development of new surveillance activities as part of preparedness, e.g. real-time mortality surveillance.

Introduction

The overall goals of influenza pandemic preparedness and response are:

First, to minimize serious illness and overall deaths, and second to minimize societal disruption among Canadians as a result of an influenza pandemic.

The strategies used to achieve these goals will depend on a number of factors including the epidemiology of the pandemic. Determination of epidemiological parameters and indicators are critical for informing the public health response. As the pandemic progresses through each phase, the surveillance activities needed to guide public health actions will change from enhanced activities in the pandemic alert phases to streamlined activities at the height of the pandemic.

In this document, influenza surveillance guidelines, including data collection, collation, analysis and dissemination/communication issues for both disease and virologic surveillance are outlined for each phase of the pandemic. In addition, detailed protocols for virologic surveillance and other laboratory procedures can be found in the laboratory annex of the Canadian Pandemic Influenza Plan (Annex C).

This document has been prepared for pandemic planning purposes as well as to facilitate a standardised approach to national influenza surveillance during the interpandemic period. While the characteristics of a novel influenza virus are not known, the experiences learned from both SARS and outbreaks of human infection with influenza A (H5N1), have underscored the importance of preparatory planning and establishing a surveillance infrastructure capacity for the detection and monitoring of emerging respiratory infections. The following framework addresses planning for surveillance in general terms; however, it should be understood that

while some of the recommended actions can be prepared for in advance, other situation-specific recommendations and alerts will need to be developed based on information that will only be available as the situation evolves.

Guidelines are necessary to ensure data are collected in a standardized manner across jurisdictions to enable national level analysis and cross-jurisdictional comparison. The guidelines represent the minimum recommended activities required for national monitoring of the evolving pandemic. Provincial and territorial jurisdictions may choose, based on their own risk assessment and experience, to increase the sensitivity of surveillance activities (e.g. increased timeliness of data collection and reporting or use of more sensitive case definitions for monitoring) while respecting national health reporting standards. Further, as additional information becomes available during the course of the pandemic, monitoring and reporting activities may be refined as necessary.

The objectives of these guidelines are to assist federal, provincial and territorial (FPT) partners in the development or enhancement of surveillance activities that will facilitate:

- ongoing risk assessment for pandemic influenza based on national and international sources
- rapid detection and monitoring of the arrival of a novel/pandemic influenza virus anywhere in Canada,
- timely description of the epidemiologic and virologic characteristics of the pandemic
- detection and characterization of unusual/unexpected disease patterns or manifestations
- real-time monitoring of disease severity indicators i.e. through real-time surveillance of hospitalizations or deaths
- implementation and discontinuation of public health measures¹
- ongoing evaluation of disease and virologic surveillance activities for each pandemic phase (e.g. timeliness, appropriate sensitivity and specificity, effectiveness in guiding public health measures)
- comparing novel influenza strains to match pandemic vaccine composition
- identification of areas of need for special studies and further research

Assumptions

- The Respiratory Illness Outbreak Response Protocol (RIORP)² will be approved and implemented in order to facilitate data sharing and communication within Canada during the pandemic. This document outlines local, PT and federal reporting processes.
- Information on the current risk assessment, epidemiologic, virologic, and clinical descriptions (based on the global situation) will be available and shared in a timely manner via our international partners (e.g., WHO).
- The majority of, if not the entire population, will be susceptible to the pandemic strain.
- During the pandemic alert period (the early phases of the arrival of a novel virus with pandemic potential in Canada) detailed reporting of epidemiological data and contact tracing for initial cases by public health will be possible.
- As the efficiency of human-to-human transmission increases, resulting in widespread activity of the novel virus in Canada, surveillance resources are expected to be strained. This may impact participation and reporting rates for routine surveillance activities such as sentinel influenza-like

1 Refer to the Public Health Measures, Annex M of the Canadian Pandemic Influenza Plan.

2 RIORP is an agreement between Federal/Provincial/Territorial governments to guide the operating procedures to assist in coordinating the investigation and control of severe respiratory outbreaks in Canada.

illness (ILI) reporting. While in some areas participation may be maintained at sufficient levels for accurate monitoring of population-based trends on a local or even provincial/territorial level, participation rates may fall off elsewhere thus limiting the representativeness of the data in certain areas or nationally. At the height of the pandemic, if population-based ILI rates become unreliable for monitoring disease spread/population impact, particularly at the regional or national level, surveillance may be limited to tallying outbreaks in residential institutions and/or assessment of regional influenza activity levels (i.e. streamlined surveillance).

- The novel virus strain (pandemic strain) will supplant other circulating influenza strains.
- The pandemic will last 12 to 18 months and more than one wave may occur within a 12 month period and could have a similar or more severe impact than the initial wave.
- PHAC will follow guidelines as per the International Health Regulations.

Special Studies

Protocols for special studies which may be conducted during the pandemic should be developed and pre-tested in the interpandemic/pandemic alert periods, recognizing that refinements may be necessary at the time of a pandemic. It is recognised that these studies will most likely be conducted in parallel to other surveillance activities.

Special studies may include, but are not limited to, serological surveys³ of early cases/clusters of human infection with a novel influenza virus, vaccine effectiveness studies, role of bacterial pathogens in the development of secondary complications and serious outcomes, investigation of reported adverse events following immunization (AEFI), antiviral resistance monitoring, and modes of transmission studies (e.g. in community or hospital-based settings).

In addition, targeted studies may be useful in supplementing routine surveillance data to assess the impact of the pandemic on the health care system as well as in terms of social and economic impact. Even if conducted at the end of the pandemic wave, special studies may serve as a means of evaluating and refining various attempted interventions to lessen the impact of successive waves of the pandemic.

Surveillance Activities by Canadian Pandemic Phases

Surveillance for pandemic influenza is expected to be founded on timely, representative and comprehensive surveillance activities that are the cornerstones of ongoing routine annual influenza surveillance, including:

- Disease/epidemiologic surveillance
- Laboratory/virologic surveillance, including antiviral resistance monitoring
- Ongoing information sharing through established communication networks (e.g. CIOSC, FluWatch, provincial and territorial networks)

Several additional activities are recommended for pandemic influenza surveillance both for enhanced detection of early warning signals and for monitoring during a pandemic, including:

- Animal health surveillance (early detection of animal outbreaks and/or animal-to-human transmission in interpandemic and pandemic alert periods)
- Monitoring vaccine and antiviral uptake
- Monitoring of adverse events following immunization

³ For a generic serosurvey protocol, refer to the following document: "Generic Serosurvey Protocol of People Exposed to Influenza", Appendix 1.

The following tables describe the surveillance objectives, roles and responsibilities for public health stakeholders at each level of government (federal, provincial/territorial and local). The tables are organized by successive phases of a pandemic based on the Canadian Pandemic Phases which reflect both the global situation (phases 1.0, 2.0, 3.0, etc.) as well as the highest level of novel virus activity in Canada (sub-phases 3.1, 4.1, 5.1, etc.). See the Background Section of the Canadian Pandemic Influenza Plan for more details.

Note: In the description of the phases the term “animal” is used to cover both avian and mammalian species.

Interpandemic Period

Table 1: Interpandemic Period

Canadian Pandemic 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.
- 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.
- 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.
- 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.

Surveillance Objectives/Roles and Responsibilities

Objectives:

- to assess the seasonal burden of influenza and to detect and describe unusual events including emergence of new strains and unexpected outcomes such as changes in distribution or increases in severity
- to establish baseline influenza activity levels

Federal:

- Provide ongoing leadership through organisation of teleconferences/meetings, providing guidance and surveillance recommendations as needed
- Align national pandemic surveillance plans with WHO global pandemic influenza surveillance plans
- Participate in the WHO Global Influenza Surveillance Network
- Conduct regular information scanning and seek verification of international disease activity of potential public health significance i.e. International Ministries of Health and/or other international surveillance networks

- Coordinate national level routine annual influenza surveillance activities via FluWatch, including hosting national influenza surveillance meetings and leading the development of recommendations for ongoing improvements of the FluWatch system
- Develop national recommendations/surveillance protocols for enhanced surveillance of severe emerging respiratory infections (SRI) for early detection and response to emerging respiratory infections
- Provide regular dissemination of surveillance information and analysis (weekly Fluwatch, annual influenza reports)
- Provide information, risk assessment and surveillance recommendations on an as needed basis in relation to identified events with pandemic potential (e.g. avian influenza) specific alerts/signals to F/P/T public health surveillance stakeholders⁴
- Lead the development of national standards for case definitions, minimum datasets and mechanisms for data collection and reporting during the pandemic phases
- Enhance linkages between federal departments including linkages between human and animal health surveillance partners (e.g., Canadian Food Inspection Agency, National Centre for Foreign Animal Diseases, Canadian Cooperative Wildlife Health Centre, etc.)
- Develop business continuity plans and increase capacity and training and/or set priorities to meet surveillance requirements during each phase of a pandemic. This includes identifying which routine activities can be suspended or reduced during a pandemic
- Develop a human resources plan to ensure sustainability of surveillance activities during a pandemic
- Work with F/P/T and Local partners to agree on phase-specific minimum surveillance activities for monitoring at each phase of the pandemic. In particular, work to establish priorities for critical common surveillance activities that can be maintained as streamlined surveillance during the height of a pandemic when resources are strained
- Coordinate the establishment of surveillance systems to estimate severity

P/T/local:

- Determine key surveillance stakeholders within P/T jurisdiction
- Ensure P/T pandemic plan is in place and align P/T/Local surveillance plans with national surveillance plans
- Participate in routine annual influenza surveillance activities (e.g. FluWatch)
- Participate in national influenza surveillance meetings
- Maintain intra-P/T surveillance networks to enable early detection of influenza activity
- Ensure capacity (surveillance infrastructure, technical/human resources) to meet national minimum standards for case detection, minimum datasets and mechanisms for data collection and reporting during the pandemic period
- Establish and maintain mechanisms for the timely sharing of surveillance data from the local to the P/T and on to the federal jurisdictions

⁴ At the federal level, regular environmental scanning for the detection of potentially significant influenza-like illness is conducted using official information sources for influenza surveillance (e.g. WHO and international government influenza surveillance programs) as well as unconfirmed reports from early warning systems (e.g. ProMed and other media scanning software such as the Global Public Health Intelligence Network (GPHIN)). Provinces and territories receive regular summaries of the international situation through the Canadian Integrated Outbreak Surveillance Centre (CIOSC).

- Provide regular dissemination of surveillance information and specific alerts/recommendations to national and jurisdictional stakeholders
- Develop business continuity plans and increase capacity and training and/or set priorities to meet surveillance requirements during each phase of a pandemic. This includes identifying which routine activities can be suspended or reduced during a pandemic
- Develop a human resources plan to ensure sustainability of surveillance activities during a pandemic
- Identify potential sentinel surveillance sites (regions, settings) that may be used to assist in focusing limited resources or answer specific questions (i.e. special studies) during a pandemic
- Work with F/P/T and Local partners to agree on phase-specific minimum surveillance activities for monitoring at each phase of the pandemic. In particular, work to establish priorities for critical common surveillance activities that can be maintained as streamlined surveillance during the height of a pandemic when resources are stretched
- Confirm that public health laboratories within the province/territory have the capacity and materials needed to isolate and subtype influenza viruses. If they do not, linkages to those laboratories having this capacity should be established and coordination agreements put in place

Table 1.1: National Surveillance Data during the Interpandemic Period⁵

Canadian Pandemic 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.
- 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.
- 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.
- 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.

National Surveillance Data

Disease surveillance

- (a) influenza activity level by P/T region (based on FluWatch definitions)
- (b) influenza-like illness (ILI) consultation rate (number of ILI sentinel physician visits/ 1000 consults)
- (c) number of laboratory-confirmed outbreaks in long-term care facilities

⁵ During the interpandemic phases, these data (FluWatch) will be reported on a weekly (during the influenza season) and bi-weekly (during the summer months) basis

- (d) number of influenza-associated hospitalizations and influenza-associated deaths in children 0-18 years through sentinel paediatric hospitals (IMPACT⁶) Laboratory surveillance

Laboratory Surveillance

- (e) percent positive influenza tests (total number of laboratory tests for influenza and number of positive results, by virus type (A or B))
- (f) strain characterisation, number identified for each strain and subtype, and percentage of total for approximately 10% of isolates from the sentinel laboratory respiratory virus detection system
- (g) increased targeted strain characterisation based on risk assessment in areas where animal strains are circulating
- (h) antiviral resistance testing for influenza isolates

Risk assessment

- (i) summary of national/international areas where animal virus activity has been confirmed
- * Appendix 2 provides a pictorial representation of the national FluWatch influenza surveillance system.

Pandemic Alert Period

Table 2, below, describes the surveillance objectives for the pandemic alert period. The objectives are general, given the unknown epidemiology of a novel influenza virus infection and uncertainties as to how it might behave in terms of efficiency of human-to-human transmission, impact on the population/population sub-groups and capacity to spread rapidly. Recommended surveillance tools and protocols, including surveillance case definitions, will need to be developed and revised based on information received as the situation evolves. The triggers that will signal the move to a new phase are generally based on relative ability to infect humans and spread efficiently among humans, as determined by observed activity and a comprehensive risk assessment. This risk assessment will include analyzing the interplay of these and other factors (e.g. infectiousness, rate of transmission, incubation period and period of communicability, severity of illness, impact of initial control measures, etc.). These factors should be viewed as general parameters which are useful for describing the critical points in the evolution and escalation of a pandemic and can only be assumed prior to strain identification and circulation of the novel virus. Furthermore, initial predictions are subject to change as the novel virus becomes adapted to human populations and flexibility will be important to respond to rapid adjustment of surveillance and related activities. As such, the following tables provide a basic framework for establishing and maintaining the recommended surveillance infrastructure and for clarifying basic roles and responsibilities to managing these activities at the various levels of government.

Supplementary Surveillance Recommendations – Ongoing Risk Assessment and Emerging Respiratory Illness Updates (Alerts/FYIs):

The ongoing maintenance and adjustment of routine surveillance activities and the timely sharing of surveillance and risk assessment information is an important supplement to the basic surveillance framework laid out in this annex. Based on ongoing risk assessment derived from

⁶ The Immunization Monitoring Program ACTive (IMPACT) is a paediatric hospital-based national active surveillance network for adverse events following immunization, vaccine failures and selected infectious diseases in children that are, or are soon to be, vaccine preventable.

the interpretation of local, regional, national and international influenza/emerging respiratory illness activity, recommendations may be made on an as-needed basis. These will guide increased vigilance and direct surveillance and investigation of severe and/or unexpected respiratory illnesses in relation to exposures of concern (high risk travel locations, exposure settings or types of contact). Furthermore, monitoring and investigation activities may be adjusted in terms of sensitivity and specificity as dictated by the evolving situation. Factors that may influence the opportunity for initial containment of cases/isolated clusters, such as the length of the incubation period and efficiency of transmission, will contribute to the decision of whether or not to continue case and cluster investigation with a view to controlling spread, if only temporarily, to buy additional time at the outset of a pandemic.⁷ The following framework should be considered with these factors in mind, underscoring the need for flexible, simple and proven activities/systems founded on good routine surveillance practices, clarified roles and responsibilities and efficient use of resources.

Table 2: Pandemic Alert Period

Canadian Pandemic 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.

Surveillance Objectives/Roles and Responsibilities

Objective:

- to detect and describe the first introduction of the novel virus in Canada
- to create awareness and ensure surveillance systems meet standards and pandemic plans are updated, tested and ready for possible implementation

Federal:

- Provide ongoing leadership through organisation of teleconferences/meetings, providing guidance and surveillance recommendations as needed
- Conduct regular information scanning and seek verification of international disease activity of potential public health significance i.e. International Ministries of Health and/or other international surveillance networks

Additional roles/responsibilities for phase 3:

- Confirm with WHO any reports of novel virus detection
- Establish current risk assessment with international surveillance partners
- Assess and convey current risk assessment to national surveillance partners
- Inform PIC/CCMOH/CPHLN/FluWatch reps of situation and advise all to remain on alert for further updates (e.g. for updates of current avian influenza H5N1 affected areas refer to <http://www.phac-aspc.gc.ca/h5n1/index.html>)
- Review surveillance annex of pandemic plans and ensure systems and resources are ready/ tested/available for rapid ramp up

⁷ Refer to the Public Health Measures, Annex M, of the Canadian Pandemic Influenza Plan.

- Review and confirm that all pandemic alert period surveillance activities via FluWatch and SRI surveillance are operating optimally
- Coordinate with P/T partners the review and modification of national case definitions. Ensure process is in place to document changes in the case definition and the definitions for reporting purposes are consistent with the international definitions
- Review/revise standard reports and pandemic reporting tools for dissemination of epidemiological and virologic information within Canada (FluWatch weekly reports for the public and CIOSC weekly situation updates for public health professionals)
- Define reporting parameters (process, frequency)
- Coordinate the implementation of surveillance systems to estimate severity of a novel virus outbreak (e.g. hospitalisations, mortality surveillance)

P/T/local:

Additional roles/responsibilities for phase 3:

- Ensure awareness and appropriate actions are carried out by key stakeholders and confirm that enhanced surveillance is implemented
- Review and confirm all normal interpandemic influenza surveillance activities via FluWatch and SRI surveillance are operating optimally
- Review the surveillance annex of pandemic plans and ensure systems and resources are ready/available for rapid ramp up if this becomes necessary
- Participate in regular information sharing with F/P/T/local stakeholders partners through teleconferences and electronic reporting
- Define reporting parameters (process, frequency, content)
- Review/revise standard reporting forms, data collection tools and surveillance reports
- Regular information sharing nationally as well as from local to provincial jurisdictions
- Implement surveillance systems to estimate severity of the pandemic (e.g. mortality surveillance) if not already established during the interpandemic period

Canadian Pandemic 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.

Surveillance Objectives/Roles and Responsibilities

Objective:

- to capture epidemiological data on the first case(s) of the novel virus infection in Canada
- to further heighten awareness and ensure surveillance systems meet standards and pandemic plans are updated, tested and ready for implementation

In addition to phase 3.0 roles and responsibilities:

Federal:

- Convene a meeting of PIC and the national surveillance working group to develop recommendations to review risk and implement enhanced surveillance e.g. awareness/heightened vigilance, surveillance/advisory at points of entry, increasing proportion of isolates subtypes and isolate referral
- Send Public Health Alert using CIOSC which includes an analysis of the epidemiologic information on the first case(s) detected in Canada (Alert to be approved by PIC)
- Follow up of potential imported/exported cases (e.g. linking with relevant international counterparts to share/obtain exposure/contact history)
- Report non-nominal case information to the WHO (for list of data elements refer to appendix 2) to be added once report form is revised
- Coordinating the enhancement of antiviral resistance monitoring

P/T/local:

- The PHLs and other viral diagnostic laboratories will be on high alert and will focus on: enhanced laboratory-based surveillance for the emerging new subtype; viral isolation by culture if appropriately equipped; implementation or augmentation of Real Time-PCR assays or other Nucleic Acid Tests (NATs) for identification and subtyping of influenza viruses. Case by case risk assessments will be used at this phase to determine the extent of enhanced surveillance⁸
- Immediately report and refer to the NML any positive influenza laboratory findings or situations in which the strain type cannot be identified at the PT laboratory level from a case with ILI symptoms and epidemiological links with the novel influenza strain to ensure rapid confirmation characterization. Refer to the laboratory annex of the CPIP for details
- Convene a meeting of P/T surveillance groups to review national recommendations, review P/T/Local recommendations and implement enhanced surveillance
- Investigation of sporadic cases, including contact tracing, public health monitoring, and collection of detailed epidemiologic data using the SRI or other available report form (<http://www.phac-aspc.gc.ca>)

Canadian Pandemic 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.

Surveillance Objectives/Roles and Responsibilities**Objective:**

- to detect and describe the first introduction of the novel virus in Canada
- to provide the information to heighten awareness and increase vigilance while ensuring system capacity and resource availability

⁸ The level of enhanced surveillance will depend on the location of the first case(s) in Canada as well as the risk assessment and whether the cases arise in Canada or are imported cases and novel viruses arising in Canada.

Federal:

- Provide ongoing leadership through organisation of teleconferences/meetings, providing guidance and advice as needed
- Conduct regular scanning and verification of national and international surveillance information e.g. Ministries of Health and other international surveillance networks
- Assess and convey current risk assessment to national surveillance partners
- Convene a meeting of PIC and the national surveillance working group to develop recommendations to review risk and implement enhanced surveillance e.g. awareness/heightened vigilance, surveillance/advisory at points of entry, increasing proportion of isolates subtypes and isolate referral
- Review surveillance annex of pandemic plans and ensure systems and resources are ready/available for rapid ramp up if this becomes necessary
- Review and confirm that all normal inter-pandemic surveillance activities via FluWatch and SRI surveillance are operating optimally
- Coordinate with P/T partners the review and modification of national case definitions. Ensure process is in place to document changes in the case definition and the definitions are consistent with the international definitions
- Review/revise standard reports for dissemination of epidemiological information within Canada
- Review/revise reporting parameters (process, frequency)

Additional roles/responsibilities for phase 4:

- Confirm with the WHO report of clusters of 2 or more cases
- Confirm case definitions with the WHO
- Review/revise Public Health Alert to increase awareness for informed public health and clinical decision making as necessary⁹ (revisions to Alert to be approved by PIC)

P/T/local:

- Ensure regular contact with key pandemic decision makers and stakeholders within P/T jurisdiction
- Ensure awareness and appropriate action is carried out by key stakeholders and confirm that enhanced surveillance is implemented
- Review surveillance annex of pandemic plans and ensure systems and resources are ready/available for rapid ramp up if this becomes necessary

Additional roles/responsibilities for phase 4:

- Review and confirm all normal inter-pandemic influenza surveillance activities via FluWatch and SRI surveillance are operating optimally
- Disseminate change in pandemic phase to health care providers

Canadian Pandemic 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.

⁹ Although it is considered unlikely that a pandemic strain will first emerge in Canada, the public health system needs to be prepared to deal with this possibility. Public Health Alerts need to address the situation for both imported and domestic cases.

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.

Surveillance Objectives/Roles and Responsibilities

Objective:

- to identify, capture epidemiological data and describe the epidemiological characteristics on the first cases and clusters of the novel virus infection in Canada
- to provide data to monitor the containment of the outbreak
- to provide the information to heighten awareness and increase vigilance while ensuring system capacity and resource availability

Federal:

- Provide ongoing leadership through organisation of teleconferences/meetings, providing guidance and advice as needed
- Conduct regular scanning and verification of national and international surveillance information e.g. Ministries of Health and other international surveillance networks
- Assess and convey current risk assessment to national surveillance partners
- Convene a meeting of PIC and the national surveillance working group to develop recommendations to review risk and implement enhanced surveillance e.g. awareness/heightened vigilance, surveillance/advisory at points of entry, increasing proportion of isolates subtyped and isolate referral
- Review surveillance annex of pandemic plans and ensure systems and resources are ready/available for rapid ramp up if this becomes necessary
- Review and confirm that all routine inter-pandemic surveillance activities via FluWatch and SRI surveillance are operating optimally
- Coordinate with P/T partners the review and modification of national case definitions. Ensure process is in place to document changes in the case definition and the definitions are consistent with the international definitions
- Review/revise standard reports for dissemination of epidemiological information within Canada
- Provide alert to increase awareness for informed public health and clinical decision making as necessary

Additional roles/responsibilities for phase 4.1, 4.2:

- Implement international border-based surveillance (depending on origin of cases) coordinated by the Centre for Emergency Preparedness and Response (PHAC)¹⁰
- Collect/compile/distribute epidemiological data for cases reported in Canada
- Establish current level of risk to guide public health actions (e.g. transmission characteristics associated with secondary cases)

¹⁰ Refer to the Public Health Measures, Annex M, of the Canadian Pandemic Influenza Plan.

¹¹ Implementation of serologic surveys can be considered at this time. Guidelines developed as a framework to be revised as needed at the time of implementation are found in appendix I. Plans for vaccine effectiveness studies should be reviewed and prepared for implementation.

- Review protocols for special studies¹¹ and prepare dedicated teams as necessary to ensure prompt activation of the studies when appropriate
- Revise case definitions based on observed clinical presentation of cases
- Report non-nominal case/cluster information to the WHO (for list of data elements refer to appendix 3)

P/T/local:

- Ensure awareness and appropriate action is carried out by key stakeholders and confirm that enhanced surveillance is implemented immediately in affected area in order to identify any human to human transmission in Canada
- Review surveillance annex of pandemic plans and ensure systems and resources are ready/available for rapid ramp up if this becomes necessary

Additional roles/responsibilities for phase 4.1, 4.2:

- Review and confirm all normal inter-pandemic influenza surveillance activities via FluWatch and SRI surveillance are operating optimally
- Conduct case/cluster investigation and report to PHAC (for list of data elements refer to appendix 3)

Canadian Pandemic Phase

5.0 Outside Canada larger cluster(s) are occurring 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). No cases identified with these clusters have been detected in Canada.

Surveillance Objectives/Roles and Responsibilities

Objective:

- to detect and describe the first introduction of the novel virus in Canada
- to heighten awareness and increase vigilance while ensuring system capacity and resource availability

Federal:

- Provide ongoing leadership
- Confirm with the WHO sustained person-to-person transmission and determine if there are outbreaks in one or more countries
- Conduct regular scanning and verification of national and international surveillance information e.g. Ministries of Health and other international surveillance networks
- Assess and convey current risk assessment to national surveillance partners
- Convene PIC and the national surveillance working group to determine situation-specific information needs and appropriate enhanced surveillance activities (increased lab testing and referral, collection of epidemiologically relevant information, e.g. travel history, immunization status, other information needed to guide the control measures based on global experience)

- Notify PIC/CCMOH/CPHLN/FluWatch reps of situation and recommended action, including situation-specific enhanced surveillance activities
- Initiate ramp up of enhanced surveillance if determined necessary (based on efficiency of human-to-human spread and assessment of pandemic potential)
- Ensure any additional systems and resources are ready/available for rapid ramp up if this becomes necessary

P/T/local:

- Ensure heightened awareness and appropriate action is carried out by key pandemic stakeholders including enhanced surveillance activities
- Ramp up to enhanced surveillance as required
- Ensure additional systems and resources are ready/available for rapid ramp up if this becomes necessary
- Information sharing with F/P/T/local partners

Canadian Pandemic Phase

5.1 Single human case(s) with virus that is better adapted to humans detected in Canada. No cluster(s) identified in Canada.

Surveillance Objectives/Roles and Responsibilities

Objective:

- to identify, capture epidemiological data and describe the epidemiological characteristics on the first cases and clusters of the novel virus infection in Canada
- to provide data to monitor the containment of the outbreak
- to provide the information to heighten awareness and increase vigilance while ensuring system capacity and resource availability

In addition to phase 5.0 roles and responsibilities:

Federal:

- Report non-nominal case/cluster information to the WHO (for list of data elements refer to appendix 3)

P/T/local:

- Conduct case investigation and report to the PHAC (for list of data elements refer to appendix 3)

Canadian Pandemic 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).

Surveillance Objectives/Roles and Responsibilities

Objective:

- to identify, capture epidemiological data and describe the epidemiological characteristics on the first cases and clusters of the novel virus infection in Canada
- to provide data to monitor the containment of the outbreak
- to provide the information to heighten awareness and increase vigilance while ensuring system capacity and resource availability

In addition to phase 5.1 roles and responsibilities:

Federal:

- Cluster within one P/T: assist with the coordination and implementation of the outbreak investigation as led by the P/T, act as the liaison with international organisations
- Clusters in more than one P/T: coordinate outbreak investigation and act as the liaison between provinces/territories as well as international organisations
- Revise case definitions based on observed clinical presentation of cases

P/T/local:

- Cluster within one P/T: lead the outbreak investigation and report to the PHAC (for list of data elements refer to appendix 3)

Table 2.1: National Surveillance Data for the Pandemic Alert Period

Canadian Pandemic 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.

National Surveillance Data

Disease surveillance

- (a) influenza activity level by P/T region (based on FluWatch definitions)
- (b) influenza-like illness (ILI) consultation rate (number of ILI sentinel physician visits/ 1000 consults)
- (c) number of laboratory-confirmed outbreaks in long-term care facilities
- (d) number of influenza-associated hospitalizations and influenza-associated deaths in children 0-18 years through sentinel paediatric hospitals (IMPACT¹²)

Laboratory surveillance

- (e) percent positive influenza tests (total number of laboratory tests for influenza and number of positive results, by virus type (A or B))

¹² The Immunization Monitoring Program ACTive (IMPACT) is a paediatric hospital-based national active surveillance network for adverse events following immunization, vaccine failures and selected infectious diseases in children that are, or are soon to be, vaccine preventable.

- (f) strain characterisation, number identified for each strain and subtype, and percentage of total for approximately 10% of isolates from the sentinel laboratory respiratory virus detection system
- (g) increased targeted strain characterisation based on risk assessment in areas where animal strains are circulating
- (h) antiviral resistance testing for influenza isolates

Risk assessment

- (i) summary of national/international areas where animal virus activity has been confirmed
- (j) summary of international activity in humans

Canadian Pandemic 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.

National Surveillance Data

Disease surveillance

- (a) influenza activity level by P/T region (based on FluWatch definitions)
- (b) influenza-like illness (ILI) consultation rate (number ILI sentinel physician visits/ 1000 consults)
- (c) number of laboratory-confirmed outbreaks in long-term care facilities
- (d) number of influenza-associated hospitalizations and influenza-associated deaths in children 0-18 years through sentinel paediatric hospitals (IMPACT¹³)

Laboratory surveillance

- (e) percent positive influenza tests (total number of laboratory tests for influenza and number of positive results, by virus type (A or B))
- (f) Strain characterisation, number identified for each strain and subtype, and percentage of total for approximately 10% of isolates from the sentinel laboratory respiratory virus detection system
- (g) increased targeted strain characterisation based on risk assessment in areas where animal strains are circulating
- (h) antiviral resistance testing for influenza isolates

Risk assessment

- (i) summary of national/international areas where animal virus activity has been confirmed
- (j) summary of international activity in humans

In addition to indicators for 3.0:

- (k) detailed epidemiological description and estimation of incubation and communicability periods (e.g. number of secondary cases)

¹³ The Immunization Monitoring Program ACTive (IMPACT) is a paediatric hospital-based national active surveillance network for adverse events following immunization, vaccine failures and selected infectious diseases in children that are, or are soon to be, vaccine preventable.

- (l) if antivirals are used for prophylaxis - antivirals: # patients with ILI after prophylaxis, length of time given prophylaxis, severe adverse events
- (m) enhanced laboratory surveillance (increased strain characterisations) targeted to areas where the first case(s) are identified. Includes subtyping samples from contacts with known exposure who report ILI symptoms (based on case by case risk assessment)
- (n) monitoring for unusual outbreaks and cluster activity

Canadian Pandemic 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.
- 5.0 Outside Canada larger cluster(s) are occurring 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). No cases identified with these clusters have been detected in Canada.

National Surveillance Data

Same data as 3.0:

Disease surveillance

- (a) influenza activity level by P/T region (based on FluWatch definitions)
- (b) influenza-like illness (ILI) consultation rate (number ILI sentinel physician visits/ 1000 consults)
- (c) number of laboratory-confirmed outbreaks in long-term care facilities
- (d) number of influenza-associated hospitalizations and influenza-associated deaths in children 0-18 years through sentinel paediatric hospitals (IMPACT)

Laboratory surveillance

- (e) percent positive influenza tests (total number of laboratory tests for influenza and number of positive results, by virus type (A or B))
- (f) strain characterisation, number identified for each strain and subtype, and percentage of total for approximately 10% of isolates from the sentinel laboratory respiratory virus detection system
- (g) Increased targeted strain characterisation based on risk assessment in areas where animal strains are circulating
- (h) antiviral resistance testing for influenza isolates

Risk assessment

- (i) summary of national/international areas where animal virus activity has been confirmed
- (j) summary of international activity in humans

Canadian Pandemic 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.
- 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.
- 5.1 Single human case(s) with virus that is better adapted to humans detected in Canada. No cluster(s) identified in Canada.
- 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).

National Surveillance Data

Same data as 3.1:

Disease surveillance

- (a) influenza activity level by P/T region (based on FluWatch definitions)
- (b) influenza-like illness (ILI) consultation rate (number ILI sentinel physician visits/ 1000 consults)
- (c) number of laboratory-confirmed outbreaks in long-term care facilities
- (d) number of influenza-associated hospitalizations and influenza-associated deaths in children 0-18 years through sentinel paediatric hospitals (IMPACT)

Laboratory surveillance

- (e) percent positive influenza tests (total number of laboratory tests for influenza and number of positive results, by virus type (A or B))
- (f) strain characterisation, number identified for each strain and subtype, and percentage of total for approximately 10% of isolates from the sentinel laboratory respiratory virus detection system
- (g) increased targeted strain characterisation based on risk assessment in areas where animal strains are circulating
- (h) antiviral resistance testing for influenza isolates

Risk assessment

- (i) summary of national/international areas where animal virus activity has been confirmed
- (j) summary of international activity in humans
- (k) detailed epidemiological description and estimation of incubation and communicability periods (e.g. number of secondary cases)
- (l) if antivirals are used for prophylaxis - antivirals: # patients with ILI after prophylaxis, length of time given prophylaxis, severe adverse events
- (m) enhanced laboratory surveillance (increased strain characterisations) targeted to areas where the first case(s) are identified. Includes subtyping samples from contacts with known exposure who report ILI symptoms (based on case by case risk assessment)

(n) monitoring for unusual outbreaks and cluster activity

In addition to data for 3.1:

(o) # and epidemiological description of settings involved

Pandemic Period

Table 3: Pandemic Period

Canadian Pandemic Phase

6.0 Outside Canada increased and sustained transmission in general population has been observed. No cases have been detected in Canada.

Surveillance Objectives/Roles and Responsibilities

Objective:

- to describe the first cases in Canada
- to inform the response by tracking occurrence and progression of the pandemic through the population

Federal:

- Provide ongoing leadership
- Confirm with the WHO reports of multiple widespread outbreaks with high rates of morbidity/mortality in multiples countries
- Conduct regular scanning and verification of national and international surveillance information e.g. Ministries of Health and other international surveillance networks
- Evaluate current epidemiology to facilitate prioritisation (if necessary) of scarce resources to high risk groups
- Convene meeting with PIC and the national surveillance working group to evaluate situation and determine information needs and frequency of reporting, e.g. geographic regions/ specific urban centres or selected population groups/health care settings for ramping up of surveillance activities (e.g. sentinel/non-sentinel surveillance ramp up to increase coverage, specimen collection, collection of mortality data)
- Scale up surveillance activities as required (frequency of data collection, additional information needs, dissemination to partners)
- Coordinate with P/T's the review and revision of case definition based on current evidence of the clinical spectrum of the disease
- Distribute revised data collection forms and database transmission instructions/protocols if not done previously
- Prepare to implement the human resources plan developed during phase 1

P/T/local:

- Have regular contact with key stakeholders within jurisdictions
- Ensure surveillance activities are scaled up, resources are in place as necessary, and appropriate action is carried out
- Prepare to implement the human resources plan developed during phase 1

Canadian Pandemic Phase

6.1 Single human case(s) with the pandemic virus detected in Canada. No cluster(s) identified in Canada.

Note: It is likely that this phase will have a very short duration and may not occur at all in Canada (i.e., novel virus activity may not be detected prior to the occurrence of a cluster of cases).

Surveillance Objectives/Roles and Responsibilities

Objective:

- to describe the first cases in Canada
- to inform the response by tracking occurrence and progression of the pandemic through the population.

In addition to phase 6.0 roles and responsibilities:

Federal:

- Collect, collate and analyse national impact and trends and provide epidemiological summaries to characterize outbreaks and impact using mortality and enhanced surveillance data (age-specific mortality rates, high risk groups)
- Provide epidemiological summaries to characterise outbreaks and impact (mortality, high risk groups, clinical presentation)
- Implement the human resources plan developed during phase 1

P/T/local:

- Collect, collate and analyse P/T impact and trends and provide epidemiological summaries to PHAC to characterize outbreaks and impact using mortality and enhanced surveillance data (age-specific mortality rates, high risk groups, clinical spectrum of the disease)
- Report antiviral use, antiviral-related adverse events to Health Canada, and adverse events following immunization (AEFI) data to PHAC
- Implement the human resources plan developed during phase 1

Canadian Pandemic Phase

6.2 Localized or widespread pandemic activity observed in Canadian population.

Surveillance Objectives/Roles and Responsibilities

Objective:

- to identify and describe the affected population thereby facilitating identification of high risk groups and comparisons between other populations or other influenza season in order to guide public health actions
- to inform the response by tracking occurrence and progression of the pandemic through the population
- to determine triggers based on decreasing activity levels for implementation of post-pandemic activities in preparation for second and later waves

In addition to phase 6.0 roles and responsibilities:

Federal:

- Scale back to streamlined surveillance (to be further defined)
- Coordinate activities for evaluation and resource planning for subsequent waves

P/T/local:

- Scale back to streamlined surveillance (to be further defined)
- Evaluate performance and plan resources for subsequent waves

Table 3.1: National Surveillance Data for the Pandemic Period

Canadian Pandemic Phase

6.0 Outside Canada increased and sustained transmission in general population has been observed. No cases have been detected in Canada.

National Surveillance Data

Disease surveillance

- (a) influenza activity level by P/T region (based on FluWatch definitions)
- (b) influenza-like illness (ILI) consultation rate (number of ILI sentinel physician visits/1000 consults)
- (c) number of laboratory-confirmed outbreaks in long-term care facilities
- (d) number of influenza-associated hospitalizations and influenza-associated deaths in children 0-18 years through sentinel paediatric hospitals (IMPACT¹⁴)

¹⁴ The Immunization Monitoring Program ACTive (IMPACT) is a paediatric hospital-based national active surveillance network for adverse events following immunization, vaccine failures and selected infectious diseases in children that are, or are soon to be, vaccine preventable.

Laboratory surveillance

- (e) percent positive influenza tests (total number of laboratory tests for influenza and number of positive results, by virus type (A or B))
- (f) strain characterisation, number identified for each strain and subtype, and percentage of total for approximately 10% of isolates from the sentinel laboratory respiratory virus detection system
- (g) increased targeted strain characterisation based on risk assessment
- (h) antiviral resistance testing for influenza isolates

Risk assessment

- (i) summary of international activity in humans

Canadian Pandemic Phase

- 6.1 Single human case(s) with the pandemic virus detected in Canada. No cluster(s) identified in Canada.

Note: It is likely that this phase will have a very short duration and may not occur at all in Canada (i.e., novel virus activity may not be detected prior to the occurrence of a cluster of cases).

National Surveillance Data

Same data as 5.1, 5.2:

Disease surveillance

- (a) influenza activity level by P/T region (based on FluWatch definitions)
- (b) influenza-like illness (ILI) consultation rate (number of ILI sentinel physician visits/ 1000 consults)
- (c) number of laboratory-confirmed outbreaks in long-term care facilities
- (d) number of influenza-associated hospitalizations and influenza-associated deaths in children 0-18 years through sentinel paediatric hospitals (IMPACT)

Laboratory surveillance

- (e) percent positive influenza tests (total number of laboratory tests for influenza and number of positive results, by virus type (A or B))
- (f) strain characterisation, number identified for each strain and subtype, and percentage of total for approximately 10% of isolates from the sentinel laboratory respiratory virus detection system
- (g) increased targeted strain characterisation based on risk assessment
- (h) antiviral resistance testing for influenza isolates

Risk assessment

- (i) summary of international activity in humans

- (j) detailed epidemiological description and estimation of incubation and communicability periods (e.g. number of secondary cases)
- (k) if antivirals are used for prophylaxis - antivirals: # patients with ILI after prophylaxis, length of time given prophylaxis
- (l) enhanced laboratory surveillance (increased strain characterisations) targeted to areas where the first case(s) are identified. Includes subtyping samples from contacts with known exposure who report ILI symptoms (based on case by case risk assessment)
- (m) monitoring for unusual outbreaks and cluster activity
- (n) # and epidemiological description of settings involved

In addition to data for 5.1, 5.2:

- (o) # surveillance regions with widespread activity, based on FluWatch definitions

NOTE: Presently, there is no mechanism for collecting mortality data on a real-time basis. This is a recognized gap in information for monitoring of severity of the pandemic. While required during inter-pandemic phases to monitor severity of annual influenza epidemics, establish baseline expected seasonal mortality trends and detect potential signals, real-time mortality surveillance is recommended at the height of a pandemic to describe the severity of the pandemic, identify high risk age groups and provide crude indications of intervention effectiveness. As well, during this heightened phase of the pandemic, resources are expected to be scarce and due to low participation/reporting rates, existing surveillance activities may no longer provide accurate or complete data. While routine surveillance activities are not expected to stop entirely, participation rates may be very low and therefore data quality and representativeness may be poor. As such, simple and flexible systems for surveillance are key. In addition to routine activities that are established and maintained, new and recommended activities, such as real-time mortality surveillance, should be simple and flexible.

Canadian Pandemic Phase

6.2 Localized or widespread pandemic activity observed in Canadian population.

National Surveillance Data

Streamlined surveillance for activity and severity: influenza activity levels (using modified indicators for assessment). Other severity indicators under consideration, as above.

Post-Pandemic Period

While the post-pandemic period suggests that the pandemic waves have ended and that the virus is no longer causing significant outbreaks in the population, it is acknowledged that the virus will continue to circulate. The following outlines activities to evaluate the surveillance activities during the pandemic, however, surveillance and laboratory activities during this time should continue to monitor changes in the pandemic virus.

Table 4: Post-Pandemic Period

Canadian Pandemic Phase

Post-Pandemic

Reports of case counts and other broad indicators of pandemic activity in Canada suggest that the pandemic virus is no longer causing significant illness in the population.

Surveillance Objectives/Roles and Responsibilities

Objective:

- to assess the seasonal burden of influenza and to detect unusual events including unusual or new strains, unusual outcomes/syndromes, or unusual distribution or severity of influenza within the population
- to evaluate and assess system's ability to provide information useful for reducing morbidity and mortality during a pandemic
- to summarise the epidemiological characteristics of the pandemic waves in Canada
- to continue to monitor changes in the pandemic virus

Federal:

Provide ongoing leadership

- Confirm with WHO end of global widespread novel virus activity
- Resume regular scanning and verification of national and international surveillance information e.g. Ministries of Health and other international surveillance networks
- Evaluate current epidemiology and end of pandemic activity
- Convene meeting with PIC and the national surveillance working group to determine any special information needs for the evaluation of surveillance system performance during the pandemic waves
- Provide epidemiological summaries to characterise the impact of the pandemic waves in Canada (spread, age-specific morbidity and mortality rates, high risk groups)
- Coordinate activities for evaluation and resource planning, including special studies for surveillance of delayed effects of the pandemic virus (e.g. neurological)
- Resume interpandemic influenza surveillance via FluWatch (except in case of additional information needs for evaluation)
- Scale back frequency and change focus of regular updates via e-mail, fax, teleconferencing and web postings to meet the needs of evaluation and planning activities
- Evaluate surveillance system performance and plan improvements as required

P/T/local:

- Resume interpandemic FluWatch and jurisdiction-specific activities
- Evaluate surveillance system performance and plan improvements as required and share the information with F/P/T/local stakeholders

Generic Serosurvey Protocol of People Exposed to Influenza

Drafted by: The Vaccine Preventable and Respiratory Infections Surveillance (VPRIS) working group, April 2006.

Background

To understand the risk of new influenza strains to humans, it is important to know their capability to infect people and cause disease. During the recent years, several avian influenza strains caused outbreaks in animals with limited secondary transmission to humans. These human cases may potentially transmit their influenza to their various types of contacts: household, healthcare workers or social contacts. In the multiple possible scenarios regarding pandemic influenza, one expects strains that will become pandemic to initially be acquired from animals, cause limited transmission and progressively hone their capacity to infect humans through adaptative mutations or reassortment.

To identify potential pandemic strains, it is important to be able to define the transmissibility of these strains to humans as well as their virulence which is their capacity to cause serious disease. When an influenza strain infects a person, it will trigger an antibody immune response specific to this strain. The presence of these antibodies is an accurate marker of infection even in absence of symptoms. Serosurveys of persons who have been in contact with infected animals or humans are therefore helpful to estimate the transmissibility of new strains and their virulence when coupled with clinical symptoms.

This generic protocol describes a methodology to conduct serosurveys in people who have been in contact with infected animals or humans. This methodology has to be adapted to the specific context of the outbreak. While the influenza strains to investigate may be of swine origin or from another type of animal, the most likely hosts of strains that will raise concerns are birds. For simplicity, the protocol will refer to avian strain when speaking of the implicated animal strain.

This protocol is a synthesis of several serosurvey protocols used elsewhere in the world after or during outbreaks of avian influenza. It describes a method that can be used with the three most frequent types of contacts investigated: workers and people in contact with infected animals, household contacts of human cases and healthcare workers in contact with patients. The study design and variables to collect will vary for each situation but laboratory assessment is common to all studies. The proposed questionnaire presents a series of questions and variables that may or may not apply to a specific situation. It is not meant to be exhaustive but can serve as a basis to construct the questionnaire adapted to the specific outbreak. Investigators should choose the items most relevant to their situation and should consider adding other questions that have not been presented but may be important in their context.

Objective

To estimate the prevalence of avian influenza-specific antibodies in persons exposed to avian influenza infected animals or patients, to describe the spectrum of illness, and assess epidemiologically associated risk factors for having antibodies to avian influenza.

Study design

Two types of surveys can be conducted. Prospective studies estimate the incidence of infections whereas retrospective studies estimate prevalence of past exposures to avian influenza without confirming the time when the infection occurred.

Description and source of study population and catchment areas

The target populations for the study should be defined with inclusion criteria describing the demographic characteristics of participants (age, gender, occupation, residence, etc...) and the type and timing of exposure to infected animals or patients.

Exposed and non exposed participants

Seroprevalence studies that include only a group of exposed persons are useful but may not be adequate to identify risk factors outside the direct exposure to an infected animal or patient that contributed to infection. The inclusion of a group of participants who have not been exposed to infected animals or patients will generally provide a different perspective on other factors or behaviours that contributed to infection. Therefore the enrolment of a group of non-exposed participants is generally recommendable.

Enrolment and data collection

The site of enrolment, the method to contact participants, to obtain their informed consent, to collect information and blood specimen should be described. It may be useful to plan to ask participants who have positive test results for antibody to avian influenza if they would agree to participate in follow-up studies. The follow-up could include 1) clinical information on an influenza-like illness if not yet available; 2) testing of banked sera if available for comparison of antibody titers to assist with the interpretation of test results; and/or 3) testing of an additional blood sample to assist with the interpretation of test results. The participant may choose to participate in any of the three components of the study that are applicable and may refuse to participate in any of them.

Variables

Variables to collect will vary according to the specific event. However the set of common characteristics that are interesting include: Age, sex, area of residence, primary occupation, medical history and underlying conditions, smoking habits, prior influenza vaccination, number of persons in the household, contacts with pet animals, travel, activities where contacts with animal may have occurred, household and non household contacts with a sick person, types of contacts, presence of symptoms of respiratory infection, duration of disease, medical consultation, hospitalization, outcome.

For occupational exposure, specific questions related to each activity and the protective measures used should be collected.

The sample questionnaire includes several variables collected during previous serosurveys and can serve as a starting point to develop the final questionnaire to use during a specific event. The questions have been grouped into sections that address specific issues. Some or all of these sections may be relevant during an outbreak and selection should be made accordingly. This questionnaire is not meant to be exhaustive and should be adapted to individual situation.

Laboratory methods

As the antibody response requires time to become detectable, specimens collected early after a contact may still be negative despite the presence of an ongoing infection whereas negative specimens collected ≥ 21 days after the last possible time of exposure rule out an infection. This concept is important for prospective studies because they will require the collection of two blood specimens: one at time of enrolment and a second one collected ≥ 21 days after the last possible time of exposure. Retrospective studies will collect only one specimen taken ≥ 21 days after the last possible time of exposure. As antibodies persist for months, a retrospective study has little risks of false negative results if conducted within six months of exposure.

The blood should be centrifuged, and serum separated, aliquoted into multiple cryovials and, labelled. If tested within a week, the serum can be kept in the refrigerator. If not tested immediately sera should be frozen at minus 20 °C. For long term conservation, sera should be frozen at minus 70 °C. Determination of antibodies to avian influenza can be done through a variety of assays including haemagglutination inhibition, neutralization assays including micro-neutralization and western blot (Ref: Rowe T, Abernathy RA, Hu-Primmer J, Thompson WW, Lu X, Lim W, Fukuda K, Cox NJ, Katz JM. Detection of antibody to avian influenza A (H5N1) virus in human serum by using a combination of serologic assays. Journal of Clinical Microbiology 1999;37:937-43) .

Sample size and statistical power

The precision of the estimate will vary with the expected prevalence of infection. The precision of prevalence in studies with only one group of exposed people is presented Table 1. Table 2 presents the number of participants per group required for different expected prevalence to obtain an 80% power.

Prevalence	Precision			
	$\pm 1\%$	$\pm 2\%$	$\pm 5\%$	$\pm 10\%$
1%	380	95	15	4
5%	1,825	456	73	18
10%	3,457	864	138	35
15%	4,898	1,225	196	49

Table 2. Sample size of each group (exposed and non-exposed) by expected level of prevalence in the exposed and non exposed group assuming an alpha threshold of 5% and a power of 80%

Prevalence in the exposed group	Prevalence in the control group			
	1%	2%	3%	5%
5%	332	653	1604	Infinite
10%	121	161	221	474
15%	71	86	104	159
20%	50	57	65	88
25%	37	42	46	58

While in many circumstances the number of people exposed will not be sufficient to obtain precise estimates, studies will still be valuable to demonstrate if transmission appears to be efficient or small.

Statistical Analysis

The primary outcome is the seroprevalence of antibody in the exposed and non exposed groups. Risk factors should be sought comparing the characteristics of positive and negative exposed patients and comparing the exposed and unexposed participants.

Ethics

Seroprevalence studies must respect the highest ethical standards for protection of the research subject and be approved by a recognized Research Ethics Board. Signed informed consent should be obtained from each subject. In respect of the individual's privacy, a study code number must be assigned to all research participants. This will allow for confidentiality of information to be maintained to the extent legally possible. A record linking the participant's name and study code number should be kept secure and confidential by the investigator. Personal information should never be divulged to a third party and only aggregate results presented at conferences and in publications. Patients should be informed that testing will only be done for the presence of antibody to influenza and other respiratory viruses, but that under no circumstance will their sample be screened for unrelated viruses such as HIV.

The benefit of these studies is to increase knowledge concerning the risk for infection from avian influenza viruses. There may be no direct benefit to the research subject who is donating blood for these studies. If antibody is detected among participants, the study may also help determine which types of exposures are associated with an increased risk of infection. The potential discomforts and hazards of seroprevalence studies are minimal. These include risks associated with venipuncture, which may cause temporary discomfort at the procedure site. Participants should have access to contact phone numbers in the consent form in the event of adverse reactions to blood draws or general concerns during the course of the study. The participant should be free to withdraw his/her sample from the serum bank and/or participation in the study at any time after the blood is drawn.

Annex 1

Sample Questionnaire for Avian influenza serosurvey

Study ID #	
Interview Date DD | MM | YYYY	Interviewer:

Nominal data *(Can be put on a separate form)*

Family Name (Last Name):	
Given Name (First Name):	
Date of Birth: DD | MM | YYYY	Home Telephone Number:
Address:	Work Telephone Number:
City:	Postal code:

Non nominal data

First three digit of the postal code:	Sex : <input type="checkbox"/> Male <input type="checkbox"/> Female
Age (years):	What is your primary occupation?

Medical History

Have you ever been diagnosed by a doctor with any of the following chronic medical conditions?				
Asthma	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Emphysema or chronic bronchitis	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Other chronic lung disease	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Chronic heart disease	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Diabetes mellitus	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Kidney failure	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Immunodeficiency	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Cancer	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Other:	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Are you taking oral steroids daily?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>	
In the past year, have you smoked a total of 5 or more packs of cigarettes or other tobacco products?		No <input type="checkbox"/>	Yes <input type="checkbox"/>	
<i>If yes:</i>				
On average, how many packs of cigarettes or other tobacco products do you smoke per day? (packs per day)				
How many years have you smoked? (years)				
Did you receive a flu shot during the past fall or winter?		No <input type="checkbox"/>	Yes <input type="checkbox"/>	
Household data				
How many total individuals (including you) live in your household?				
How many individuals are there in each of the following age categories	0 - 5 years	6 - 17 year	18 - 64 years	65 + years
In your residence, is there a pet animal?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>	
<i>If yes, is it a:</i> Bird	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Cat	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Dog	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Another animal (specify):	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>	

Excluding you, do any of your household members currently work at:	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Any activities related to raising or processing poultry?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Any activities related to raising or processing pigs?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Any activities related to raising or processing other animals?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Is a health care worker?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Does anyone excluding you smoke cigarettes inside your household?			

Travel outside region of residence

Did you travel outside your area of residence in the month before (put the exposure period)	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
<i>If yes,</i> Where did you go?			
What date did you leave?	DD | MM | YYYY		
At what date did you come back?	DD | MM | YYYY		

Symptoms of respiratory infection DURING (period of interest to define), did you newly develop any of the following symptoms?

Have you ever been diagnosed by a doctor with any of the following chronic medical conditions?			
			Date of onset
Feverishness	No <input type="checkbox"/>	Yes <input type="checkbox"/>	DD | MM | YYYY
Measured temperature $\geq 38^{\circ}\text{C}$	No <input type="checkbox"/>	Yes <input type="checkbox"/>	DD | MM | YYYY
Cough	No <input type="checkbox"/>	Yes <input type="checkbox"/>	DD | MM | YYYY
Sore throat	No <input type="checkbox"/>	Yes <input type="checkbox"/>	DD | MM | YYYY
Runny nose	No <input type="checkbox"/>	Yes <input type="checkbox"/>	DD | MM | YYYY
Body aches	No <input type="checkbox"/>	Yes <input type="checkbox"/>	DD | MM | YYYY
Headache	No <input type="checkbox"/>	Yes <input type="checkbox"/>	DD | MM | YYYY
Red or watery eyes	No <input type="checkbox"/>	Yes <input type="checkbox"/>	DD | MM | YYYY
If you were sick:			
How many days did your illness last?	(days)		
Were you so ill that you could not come to work?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	
Did you seek medical attention?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	
Were you hospitalized?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	

During the exposure period (to define), did you do the following activities?

Play outdoors?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Visit bird parks or aviaries?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Visit any place where there were wild birds (sparrows, robins, etc.)?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Visit any place where there were pet birds (song birds, parrots, etc.)?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Visit any place where there were wild pigeons (i.e. in a park)?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Visit a poultry farm?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Visit another type of farm?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Clean up an area where wild bird feces were visible?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Clean up pet bird feces?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Clean up an area where poultry feces were visible?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Visit any place where there were other types of animals than birds?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>

Household contacts with a sick person

How many days did you spend with the patient between:			
Period 1: (7 days before onset of disease in the index case):	<input type="text"/>	Days	
Period 2: (7 days from onset of disease in the index case):	<input type="text"/>	Days	
Did you talk with ill person?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Did you eat meal with ill person?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Did you share utensils or cups with ill person?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Did you hug ill person?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Did you kiss ill person?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Did you take care of this ill person?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Did you share the same sleeping room as ill person(s)?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Did you share bed with ill person(s)?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>

Non household contacts with a sick person

During the time from	to	(Period to define)	
Have you been in contact with anyone ill with fever, cough, or sore throat?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
<i>If yes,</i>			
Were you ever in an enclosed area (e.g. room or vehicle/bus/car) with this ill person?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Were you ever within 3 meters of this ill person?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Did you talk with ill person?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Did you eat meal with ill person?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Did you share utensils or cups with ill person?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Did you hug ill person?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Did you kiss ill person?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Did you take care of this ill person?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Did you share the same sleeping room as ill person(s)?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Did you share bed with ill person(s)?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>

Poultry and Other Animal Exposures

Did you ever:			
Live or work on a poultry farm?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Live or work on a pig farm?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Work as a butcher?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Work in a restaurant preparing poultry or pork?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Work in any other aspect of poultry or pig industry?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
<i>If yes Specify:</i>			
If yes to any of the above, during what time period?	MM | YYYY	through	MM | YYYY
Have you ever hunted birds or waterfowl?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	
<i>If yes, what types:</i>			

Occupational exposure to poultry

During the period (period of interest to define), have you worked in any of the following settings?		
Poultry hatchery	No <input type="checkbox"/>	Yes <input type="checkbox"/>
Poultry farm	No <input type="checkbox"/>	Yes <input type="checkbox"/>
Poultry slaughter	No <input type="checkbox"/>	Yes <input type="checkbox"/>
Poultry depopulation operations	No <input type="checkbox"/>	Yes <input type="checkbox"/>
Poultry necropsy	No <input type="checkbox"/>	Yes <input type="checkbox"/>
Laboratory processing of poultry pathogens (e.g. avian viruses)	No <input type="checkbox"/>	Yes <input type="checkbox"/>
<i>Other, please specify:</i>		
If yes to any of the above		
how many years have you worked with poultry?	<input type="text"/>	(years)
how often did you work with poultry on average?	<input type="text"/>	(day/week)
	<input type="text"/>	(weeks/year)
During the period (period of interest to define), have you worked with any of the following types of live poultry or waterfowl?		
Chicken	No <input type="checkbox"/>	Yes <input type="checkbox"/>
Turkey	No <input type="checkbox"/>	Yes <input type="checkbox"/>
Duck	No <input type="checkbox"/>	Yes <input type="checkbox"/>
Quail	No <input type="checkbox"/>	Yes <input type="checkbox"/>
Goose	No <input type="checkbox"/>	Yes <input type="checkbox"/>
<i>Other type of poultry, please specify:</i>		
During the period (period of interest to define), in which of the following activities did you engage?		
Come within 1 meter of live poultry	No <input type="checkbox"/>	Yes <input type="checkbox"/>
Touch live poultry	No <input type="checkbox"/>	Yes <input type="checkbox"/>
Touch ill or diseased poultry	No <input type="checkbox"/>	Yes <input type="checkbox"/>
Slaughter poultry	No <input type="checkbox"/>	Yes <input type="checkbox"/>
Clean poultry stalls, cages or trucks	No <input type="checkbox"/>	Yes <input type="checkbox"/>
Process poultry specimens in a lab	No <input type="checkbox"/>	Yes <input type="checkbox"/>
<i>Other types of work with poultry</i>		

If exposed to infected poultry

Please indicate if you engaged in any of the following tasks and, if so, how many days per week on average did you engage in the specified activity for at least part of the day. For each activity, please specify if you wore protective gear while engaging in the specific task.

Came within 1 meter of healthy birds?	No <input type="checkbox"/>	Yes <input type="checkbox"/>
	<i>If yes:</i> <input type="text"/> (days/wk)	
Wore gloves?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>
Wore mask?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>
Wore eye protection?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>
Came within 1 meter of ill birds?	No <input type="checkbox"/>	Yes <input type="checkbox"/>
	<i>If yes:</i> <input type="text"/> (days/wk)	
Wore gloves?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>
Wore mask?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>
Wore eye protection?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>
Came within 1 meter of birds that tested positive for avian influenza?	No <input type="checkbox"/>	Yes <input type="checkbox"/>
	<i>If yes:</i> <input type="text"/> (days/wk)	
Wore gloves?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>
Wore mask?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>
Wore eye protection?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>
Touched healthy birds?	No <input type="checkbox"/>	Yes <input type="checkbox"/>
	<i>If yes:</i> <input type="text"/> (days/wk)	
Wore gloves?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>
Wore mask?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>
Wore eye protection?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>
Touched live birds that were ill?	No <input type="checkbox"/>	Yes <input type="checkbox"/>
	<i>If yes:</i> <input type="text"/> (days/wk)	
Wore gloves?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>
Wore mask?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>
Wore eye protection?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>
Touched dead birds?	No <input type="checkbox"/>	Yes <input type="checkbox"/>
	<i>If yes:</i> <input type="text"/> (days/wk)	
Wore gloves?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>
Wore mask?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>
Wore eye protection?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>
Touched live or dead birds that tested positive for avian influenza?	No <input type="checkbox"/>	Yes <input type="checkbox"/>
	<i>If yes:</i> <input type="text"/> (days/wk)	
Wore gloves?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>
Wore mask?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>
Wore eye protection?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>
Collected cloacal or endotracheal swabs?	No <input type="checkbox"/>	Yes <input type="checkbox"/>
	<i>If yes:</i> <input type="text"/> (days/wk)	
Wore gloves?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>
Wore mask?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>
Wore eye protection?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>
Collected environmental swabs from chicken or turkey houses?	No <input type="checkbox"/>	Yes <input type="checkbox"/>
	<i>If yes:</i> <input type="text"/> (days/wk)	

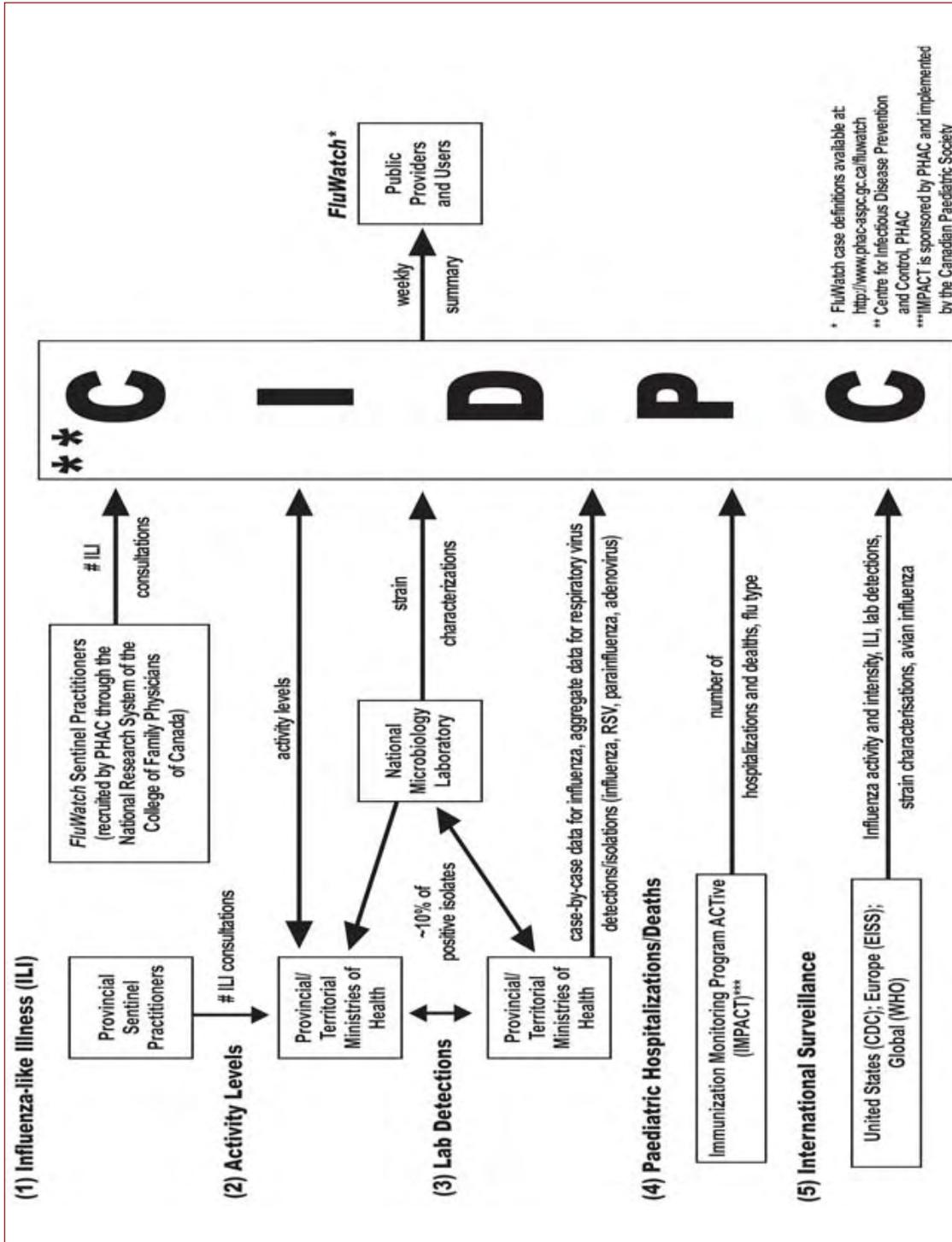
Wore gloves?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>	Most of the time <input type="checkbox"/>	Always <input type="checkbox"/>
Wore mask?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>	Most of the time <input type="checkbox"/>	Always <input type="checkbox"/>
Wore eye protection?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>	Most of the time <input type="checkbox"/>	Always <input type="checkbox"/>
Have you been present for unloading or offloading of dead birds?				No <input type="checkbox"/> Yes <input type="checkbox"/>
<i>If yes:</i> <input type="text"/>				(days/wk)
Wore gloves?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>	Most of the time <input type="checkbox"/>	Always <input type="checkbox"/>
Wore mask?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>	Most of the time <input type="checkbox"/>	Always <input type="checkbox"/>
Wore eye protection?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>	Most of the time <input type="checkbox"/>	Always <input type="checkbox"/>
Have you been present for incineration of birds?				No <input type="checkbox"/> Yes <input type="checkbox"/>
<i>If yes:</i> <input type="text"/>				(days/wk)
Wore gloves?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>	Most of the time <input type="checkbox"/>	Always <input type="checkbox"/>
Wore mask?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>	Most of the time <input type="checkbox"/>	Always <input type="checkbox"/>
Wore eye protection?	Never <input type="checkbox"/>	Sometimes <input type="checkbox"/>	Most of the time <input type="checkbox"/>	Always <input type="checkbox"/>
If you wore a mask for any of the activities described above, what type of mask did you wear?				
Please describe any other activities that brought you near to or in contact with poultry during (period of exposure)				

Hospital Work and exposure to patients

What is your occupation in the hospital?			
Nurse <input type="checkbox"/> Nurses aid <input type="checkbox"/> Doctor <input type="checkbox"/> Laboratory worker <input type="checkbox"/> Cleaner <input type="checkbox"/>			
Other <input type="text"/>			
What department(s) do you work at?			
What floor(s) do you work on? (list all floors)			
How many hours per week do you work in the hospital? (hours per week)			
Do you work at any other hospital?		No <input type="checkbox"/>	Yes <input type="checkbox"/>
<i>If "yes", what other hospitals do you work at?</i>			
Have you been in the same room as one of the avian flu patients?		No <input type="checkbox"/>	Yes <input type="checkbox"/> Unknown <input type="checkbox"/>
<i>If yes,</i>			
How many hours in total have you been in the same room with all the avian flu patients? <input type="text"/> (hours)			
What was the last date that you have been in the same room with a patient?			DD | MM | YYYY
Were the avian flu patients wearing masks?		No <input type="checkbox"/>	Yes <input type="checkbox"/> Unknown <input type="checkbox"/>
Did you touch any of the avian flu patients?		No <input type="checkbox"/>	Yes <input type="checkbox"/> Unknown <input type="checkbox"/>
When you were in the same room as an avian flu patient, did you wear a mask?		No <input type="checkbox"/>	Yes <input type="checkbox"/> Unknown <input type="checkbox"/>
<i>If "yes", indicate what type of mask:</i>		N95 <input type="checkbox"/>	Surgical mask <input type="checkbox"/>
Other mask: <input type="text"/>			
Did you always wear a mask when you provided care?		No <input type="checkbox"/>	Yes <input type="checkbox"/> Unknown <input type="checkbox"/>
When you were in the same room as an avian flu patient, did you wear any eye protection?		No <input type="checkbox"/>	Yes <input type="checkbox"/> Unknown <input type="checkbox"/>
<i>If "yes" indicate what type of eye protection:</i>		Goggles <input type="checkbox"/>	Glasses <input type="checkbox"/> Face shield <input type="checkbox"/>

	Other:		
Did you always wear eye protection when you provided care?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
When you were in the same room as an avian flu patient, did you wear gloves?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
<i>If "yes". Did you always wear gloves when you provided care?</i>	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
Have you been involved in performing or assisting to any of the following high risk procedures with avian flu patients :			
Nebulized therapies	No <input type="checkbox"/>	Yes <input type="checkbox"/>	
Aerosol humidification	No <input type="checkbox"/>	Yes <input type="checkbox"/>	
Non-invasive ventilation (CPAP, BiPAP)	No <input type="checkbox"/>	Yes <input type="checkbox"/>	
Use of bag-valve mask to ventilate a patient	No <input type="checkbox"/>	Yes <input type="checkbox"/>	
Endotracheal intubation	No <input type="checkbox"/>	Yes <input type="checkbox"/>	
Airway suctioning	No <input type="checkbox"/>	Yes <input type="checkbox"/>	
Sputum induction	No <input type="checkbox"/>	Yes <input type="checkbox"/>	
Tube or needle thoracotomy	No <input type="checkbox"/>	Yes <input type="checkbox"/>	
Bronchoscopy or other upper airway endoscopy	No <input type="checkbox"/>	Yes <input type="checkbox"/>	
Tracheostomy	No <input type="checkbox"/>	Yes <input type="checkbox"/>	
Open Thoracotomy	No <input type="checkbox"/>	Yes <input type="checkbox"/>	
When you did these procedures, did you wear a mask?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	
<i>If "yes", indicate what type of mask:</i>		N95 <input type="checkbox"/>	Surgical mask <input type="checkbox"/>
	Other mask:		
When you did these procedures, did you wear eye protection?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	
<i>If "yes" indicate what type of eye protection:</i>	Goggles <input type="checkbox"/>	Glasses <input type="checkbox"/>	Face shield <input type="checkbox"/>
	Other:		
Did you take the antiviral drug "Tamiflu" (oseltamivir) since (period of interest)?	No <input type="checkbox"/>	Yes <input type="checkbox"/>	Unknown <input type="checkbox"/>
<i>If "yes", why did you take it because</i>			
You had flu symptoms			<input type="checkbox"/>
You had direct contact with an avian flu patient			<input type="checkbox"/>
No direct contact with an avian flu patient but there were cases in the hospital			<input type="checkbox"/>

National FluWatch Influenza Surveillance System



National SRI Investigation Report Form Data Elements

(please refer to form for definitions : www.phac-aspc.gc.ca)

Reporting Information

- √ Name/affiliation of person making report
- √ Reporting contact phone number
- √ Date of Report

Patient Information

- √ Gender
- √ Date of Birth
- √ Age at outset
- √ Forward Sorting Locator
- √ City of residence
- √ Health unit of residence
- √ Occupation

Surveillance definition algorithm

- √ Hospitalized patients: symptoms
- √ Epi-link/Risk factors
- √ Post-mortem
- √ Case classification
- √ Isolation date

Clinical Information

- √ Clinical presentation
- √ Symptoms onset date
- √ Was patient hospitalized (date of admission/ date of discharge)
- √ Course of illness
- √ Disposition at time of report

Underling Illness

- √ Chronic heart disease
- √ Lung disease
- √ Diabetes
- √ Immune suppressed
- √ Kidney disease
- √ Other

Travel Related

- √ Travel to Zone of Re-emergency/
- √ Emergency (ZRE) or H5N1 affected area
- √ Country/Hotel (residence)
- √ Date of arrival/date of departure
- √ Part of a tour
- √ Ill during flight
- √ Flight number
- √ Carrier
- √ Seat
- √ City of origin
- √ Date of flight

Exposure history

- √ Contact of previously identified SRI case
- √ Contact case status
- √ Type of contact
- √ Date of first contact
- √ Date of last contact
- √ Contact with HCW
- √ Contact with traveller to ZRE of H5N1
- √ Contact with traveller to ZRE of H5N1
- √ Contact with laboratory worker who works directly with emerging or re-emerging pathogens

Laboratory Testing

- √ SRI Lab tracking code
- √ Date specimen collected
- √ Specimen source
- √ Test method
- √ Test result
- √ Date test performed
- √ Comments

The Role of Emergency Social Services in Planning for Pandemic Influenza in Canada

Date of Latest Version: September 2008

Note:

- This is a new Annex to the Canadian Pandemic Influenza Plan for the Health Sector.
- This annex will be referenced in the Preparedness Section, 1.3 Emergency Management and Coordination, once the Main Body of the CPIP has been updated in 2009.



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1.0 Preamble: Council of Emergency Social Services Directors

The members of the Council of Emergency Social Services Directors (CESSD) are the senior managers/directors, designated by each province and territory, who have the authority and responsibility to take the leading role in Emergency Social Services (ESS) planning and management. The Public Health Agency of Canada is represented in an ex-officio (non-voting) capacity by the Director General of the Centre for Emergency Preparedness and Response or his or her designate. Other participants, such as a representative of the Council of Health Emergency Management Directors and the Council of Voluntary Sector Directors, may participate in council activities by invitation.

CESSD is a body that is knowledgeable about ESS planning and management in relation to issues of pan-Canadian concern. Its role includes providing leadership, advice, guidance and recommendations on strategies to prepare for and manage the broad range of hazards and threats that constitute potential emergencies in Canada.

The Council provides leadership, advice, support and guidance for forums concerned with emergency preparedness and response development and for policies related to ESS. The categories of ESS* are as follows: registration (for ESS services) and inquiry, lodging, food, clothing, personal services and reception centre/shelter services. More information on the mandate of CESSD is noted towards the end of this document.

2.0 ESS

ESS planning for pandemic influenza needs to be an integral part of a coordinated response and placed in the context of government-wide priorities. The unique characteristics of pandemic influenza will create some extraordinary considerations for all stakeholders in emergency management. For example, ESS planning is contingent on the following assumptions, which reflect the unique features of pandemic influenza:

- The influenza pandemic will likely originate outside North America, and we may have advance warning of its arrival.
- Outbreaks will occur simultaneously across the country, preventing reallocation of human and other resources from one jurisdiction to another.
- The influenza pandemic could last for several weeks or even months at a time.
- Health care workers and other first responders will face a higher risk of exposure (but not necessarily infection) than the general population, potentially reducing response capacity because of absenteeism.

* ESS services may vary within province/territory.

- Widespread illness will increase the likelihood of personnel shortages for ESS responders and for other key areas such as police, fire, utility and transportation services and human resources across all spectrums of response.

Many of the traditional ESS responses will not be applied during an influenza pandemic. For example, in a pandemic, emergency clothing will not likely be an issue. Also, as explained later in this document, there may not be a need for traditional ESS shelters or reception centres. Planning for pandemic influenza may, however, need to take into consideration the real societal consequences and economic impacts that will occur as a result of the pandemic and the capacity, duration and availability of ESS resources to respond. Major risk management and due diligence issues need to be addressed by all partners in ESS.

This annex is intended to outline the mandate of ESS and the activities performed by ESS. As well, the specific activities described in the table at the end of the annex represent overriding issues that will affect the delivery of ESS during an influenza pandemic.

3.0 Personal Preparedness

To mitigate the effect of an influenza pandemic, ESS personnel will support the work of local authorities, non-governmental organizations (NGOs), emergency measures/management organizations and health organizations to encourage Canadians to have personal preparedness plans. Federal government departments and agencies have prepared detailed preparedness planning material available for distribution (http://www.influenza.gc.ca/index_e.html). Personal preparedness will also include general information on universal precaution protocols for mitigating the effects of influenza. Jurisdictions have an interest in actively promoting this preparedness planning and should do so by demonstrating the value of planning from the individual's perspective. The value from an ESS perspective would be a reduction in the need to respond, as individuals and communities become more self-sufficient and resilient.

4.0 Communication

It is evident that pandemic influenza will require clear communication, which balances the need to reduce the anxiety of the public and provides them with important information to better understand what pandemic influenza is and how to cope. The responsibility could lie with local authorities, emergency measures/management organizations and health organizations within the context of a national strategy. For ESS, this will mean informing the public of the ESS services available and how to access them, and ensuring that the approach to ESS services delivered by government and/or community agencies is coordinated. Consideration may be given to establishing public information lines that could be modeled after a “one-stop” service concept and could direct callers to appropriate services already existing in their respective jurisdictions.

5.0 NGOs

Pandemic influenza may require NGOs to step beyond their traditional responses in order to address public needs in communities. Providing agencies with a clear understanding of ESS requirements during an influenza pandemic will allow them to develop adequate response plans. NGOs depend on volunteers and staff. It is anticipated that both will be in short supply during an influenza pandemic. Therefore, NGOs will need to be judicious in identifying what critical core services they can provide to the community. This information will assist ESS in determining what services are available and what gaps exist.

6.0 Volunteers

The widespread use of volunteers in a pandemic influenza response will require a review of a number of issues. Governments need to determine the extent of their liability when using volunteers in a potentially risky pandemic response effort. ESS volunteers and staff should be expected to receive considerations of safety and protection, such as access to gloves, masks, vaccines, universal protection training and other safety protocols as appropriate to the functions they will be asked to perform during an influenza pandemic. Each jurisdiction will determine where ESS volunteers can be utilized most effectively and safely. A description of the volunteer roles will be required, and appropriate processes for screening and reference checks need to be put in place. The responsibility for volunteer management in a pandemic varies, depending on the jurisdiction and the extent to which volunteers will be used in a pandemic influenza response (for additional details see Annex J: *Guidelines for Non-Traditional Sites and Workers*, of the Canadian Pandemic Influenza Plan for the Health Sector).

7.0 Training

Basic training for ESS volunteers and staff in response to pandemic influenza will be focused on keeping them all healthy and safe. Once the roles for ESS volunteers and staff have been identified, additional training can be delivered on the specific assigned responsibilities. Volunteers and staff are encouraged to participate in ESS training modules and exercises.

8.0 First Nations and Inuit Communities

Provincial and territorial ESS groups across the country support assisting First Nations and Inuit communities during an influenza pandemic, using the general agreements and/or arrangements of mutual aid that currently exist in all provinces and territories. They also support forging closer relationships in the future between provincial/territorial ESS groups and First Nations and Inuit communities for all hazards. This would be for the “four emergency pillars” of mitigation, preparedness, response and recovery.

9.0 Supply Chain Issues

One of the features of an influenza pandemic will be the potential impact on the supply chain, and this has implications for the public's access to essential goods such as food, fuel and medications. Supplies could be affected at some point during the pandemic by lack of delivery modes or shortages in the goods themselves. It is anticipated that many areas of the marketplace can reasonably expect mild to severe supply chain shortages. Consideration will have to be given to supply and transportation issues as well as the protection of critical infrastructure. Although most of these issues are outside the scope of ESS, failure to have plans in place will adversely affect the ability of ESS personnel to provide critical services as mandated.

10.0 Non-Traditional Care Sites

The establishment and use of non-traditional care sites will vary by jurisdiction, as will the role to be played by ESS in these sites. In some jurisdictions, ESS may coordinate a range of volunteer services, may be involved in the provision of non-medical services or may handle the registration and inquiry needs of these facilities. In other jurisdictions, no services will be provided by ESS to facilities that offer medical services.

The role ESS plays in non-traditional care sites will be determined by a number of factors, including the extent of ESS services required within the provincial/territorial pandemic plan and the availability of human and other resources (for additional details see Annex J: *Guidelines for Non-Traditional Sites and Workers*, of the Canadian Pandemic Influenza Plan for the Health Sector).

The specific activities described in the following table represent overriding issues that will have an impact on the delivery of ESS during an influenza pandemic.

Emergency Social Service Mandate	Traditional/Normal ESS Response <small>(functions may vary within province/territory)</small>	Additional Implications for Pandemic Influenza <small>(functions may vary within province/territory)</small>
Reception Centre Management		
<ul style="list-style-type: none"> • Reception of persons affected by emergency/disaster • Coordinated provision of any or all of the five mandated ESS services: <ul style="list-style-type: none"> • Registration and inquiry • Registration and inquiry • Lodging • Food • Clothing • Personal services 	<ul style="list-style-type: none"> • May also provide or arrange for the following: <ul style="list-style-type: none"> • Meet and greet • Public information • Security and safety • First aid • Care for transient populations • Recruitment of human resources • Triage of service needs • Communication • Logistics planning, including transportation • Site identification is usually determined by the municipality in consultation with the emergency measures/ management organizations (EMOs). 	<ul style="list-style-type: none"> • Because of the widespread nature of pandemic influenza, one-stop reception centres are needed more than ever. However, ESS personnel should be advised on personal protective measures as appropriate to the functions they are expected to perform.

Emergency Social Service Mandate	Traditional/Normal ESS Response <small>(functions may vary within province/territory)</small>	Additional Implications for Pandemic Influenza <small>(functions may vary within province/territory)</small>
Registration and Inquiry		
<ul style="list-style-type: none"> • Collection of accurate and reliable information • Response to inquiries about the conditions/whereabouts of people affected by emergencies/disasters • Assistance in reunification of separated family members • Provision of information to other emergency response agencies offering essential services to people affected by emergencies/disasters • Provision of information on numbers serviced – “People Management” 	<ul style="list-style-type: none"> • Registration for ESS services • Collection of information by municipal and/or provincial authorities in order to establish a centralized register of people affected by emergencies/disasters and thereby facilitate the reunification of individuals • Registration of people affected by emergencies/disasters at a collecting point identified by local authorities or in emergency shelters (could use Health Canada forms, as well as local or provincial forms) • Assistance from certain non-governmental organizations (NGOs) in registering evacuees, foreign citizens or visitors who find themselves in a disaster zone • In some jurisdictions, the Red Cross has an agreement to assist in family reunification. 	<ul style="list-style-type: none"> • Heavier emphasis will be placed on the use of telephone and other communication modalities for delivery of services. • Consideration will be given to sharing of personal information without signed consent. • The implications of receiving a request for services from agencies rather than from individuals will be considered.
Emergency Lodging		
<ul style="list-style-type: none"> • This is defined as safe, temporary lodging that could be provided as follows: <ul style="list-style-type: none"> • Private accommodation • Commercial hotels/motels • Congregate group facilities, such as schools, churches, community halls, arenas and auditoriums. • Consideration may be given to a number of factors: <ul style="list-style-type: none"> • Availability of family/friends • Monetary cost • Safety/security • Accessibility • Liability • Transportation • Volunteer staff to manage these sites. 	<ul style="list-style-type: none"> • Organize emergency shelters or support municipal authorities in their efforts to organize such shelters. • Coordinate stays in facilities such as <ul style="list-style-type: none"> • Hotels • Motels • Congregate lodging facilities, e.g. university dorms, summer camps. 	<ul style="list-style-type: none"> • In conjunction with EMOs and local municipalities, assist in the identification and use of traditional sites, such as schools, stadiums, church basements and hotels, for possible use as non-traditional health sites.

Emergency Social Service Mandate	Traditional/Normal ESS Response <small>(functions may vary within province/territory)</small>	Additional Implications for Pandemic Influenza <small>(functions may vary within province/territory)</small>
Emergency Food		
<ul style="list-style-type: none"> • Provide food to people affected by emergencies/disasters and in some situations to responders 	<ul style="list-style-type: none"> • Organize provision of emergency foods using community resources: <ul style="list-style-type: none"> • Restaurants • Meals-on-wheels • Canteens • School cafeterias • Caterers • Grocery stores • Non-governmental organizations. • Possibly become involved in food processing, preparation, delivery and waste disposal. • Work closely with provincial/territorial health authorities in planning and preparation of meals. • Consider the following: <ul style="list-style-type: none"> • Refrigeration • Safe food handling • Method of food delivery, i.e. feeding units/home delivery/restaurant vouchers • Cultural and dietary specific issues. 	<ul style="list-style-type: none"> • May need to consider home delivery of groceries and/or delivery of prepared meals.
Emergency Clothing		
<ul style="list-style-type: none"> • Meet basic clothing needs until normal sources of supply are available to people affected by emergency/disaster. 	<ul style="list-style-type: none"> • Provide required clothing (may include blankets, bedding and essential personal items). • Comfort kits may be provided by community agencies or non-governmental organizations. <p style="margin-top: 10px;"><i>* Comfort kits include such items as toothbrushes, toothpaste, deodorant, razors, soap and other personal items</i></p>	<ul style="list-style-type: none"> • There are no special clothing requirements in an influenza pandemic. • Possible need for ESS to deliver comfort kits and other essential supplies to individuals and families in isolation or unable to get out.

Emergency Social Service Mandate	Traditional/Normal ESS Response <small>(functions may vary within province/territory)</small>	Additional Implications for Pandemic Influenza <small>(functions may vary within province/territory)</small>
Personal Services and Psychosocial Intervention		
<ul style="list-style-type: none"> • Physical needs • Social needs • Emotional needs • Financial needs 	<ul style="list-style-type: none"> • Delivery of services could include the following: <ul style="list-style-type: none"> • Care for vulnerable populations, such as unattended children, seniors and persons with disabilities • Provision of mental health services • Psychosocial crisis intervention • Religious/spiritual support • Ethno-cultural services • Job loss counseling • Bereavement • Alternative financial income • Care of pets • Recreation • Interpretation services • Worker care and support. 	<ul style="list-style-type: none"> • Consideration of different modes or methods of service delivery

Broader ESS Issues/Activities	Traditional/Normal ESS Response <small>(functions may vary within province/territory)</small>	Additional Implications for Pandemic Influenza* <small>(functions may vary within province/territory)</small>
<ul style="list-style-type: none"> • Personal preparedness 	<ul style="list-style-type: none"> • Encourage individuals to have a short-term personal plan to mitigate the need for ESS response. 	<ul style="list-style-type: none"> • Partner with lead agencies/ organizations for long-term personal preparedness plans required for specific pandemic response, to mitigate the need for ESS response.
<ul style="list-style-type: none"> • Communication 	<ul style="list-style-type: none"> • Work with partners to ensure that there is clear communication related to ESS – its mandate, roles, responsibilities and services provided. 	<ul style="list-style-type: none"> • Work with partners to ensure that there is clear communication related to ESS – its mandate, roles, responsibilities and services related to pandemic influenza.
<ul style="list-style-type: none"> • Partnership with NGOs 	<ul style="list-style-type: none"> • Liaise with NGOs that traditionally work with governments to deliver/ support emergency social services (e.g. Red Cross, Salvation Army, St. John Ambulance). 	<ul style="list-style-type: none"> • Work with NGOs to increase their staff/volunteer capacity to respond. • Partner with other lead agencies/ organizations to access non-traditional NGOs and request support (e.g. service clubs, faith communities).
<ul style="list-style-type: none"> • Volunteers 	<ul style="list-style-type: none"> • Partner with NGOs and community volunteers to ensure that the traditional ESS mandate, roles, responsibilities and services are understood and carried out. 	<ul style="list-style-type: none"> • Partner with other lead agencies to establish volunteer ESS coordination, volunteer training and volunteer risk management associated with a pandemic response.

Broader ESS Issues/Activities	Traditional/Normal ESS Response <i>(functions may vary within province/territory)</i>	Additional Implications for Pandemic Influenza* <i>(functions may vary within province/territory)</i>
<ul style="list-style-type: none"> • Training 	<ul style="list-style-type: none"> • Train staff and volunteers in the six ESS core functions. 	<ul style="list-style-type: none"> • Work with partners to establish specialized training specific to pandemic influenza (e.g. public health information, personal protection).
<ul style="list-style-type: none"> • Supply chain issues 	<ul style="list-style-type: none"> • Supply chain issues other than emergency feeding are outside ESS scope. 	<ul style="list-style-type: none"> • Partner with NGOs, organizations, agencies and other government departments to ensure that emergency feeding mandate can be met.
<ul style="list-style-type: none"> • Non-traditional care sites 	<ul style="list-style-type: none"> • Traditionally there is no ESS involvement in non-traditional care sites. 	<ul style="list-style-type: none"> • Some jurisdictions may require ESS assistance to coordinate a range of non-medical services within these sites. This will be dependent upon agreements between health and ESS agencies. “Non-medical services” refers to such things as reception services, food services, cleaning services, emotional support and/or communication services.
<p>*See Preamble for further information.</p>		

Glossary of Terms and List of Acronyms



Glossary of Terms and List of Acronyms

A

ACD

Acute and communicable disease prevention

Acute

Short term, intense symptomatology or pathology, as distinct from chronic. Many diseases have an acute phase and a chronic phase. This distinction is sometimes used in treatments.

Acute care

Services provided by physicians and other health professionals and staff in the community and in hospitals. These include emergency, general medical and surgical, psychiatric, obstetric and diagnostic services.

AEFI

Adverse Event Following Immunization*

Alternate level of care

See also Acute care, InterQual criteria

Alternative care that, had it been available, would have been more appropriate for a person in an acute care hospital who does not meet the criteria for acute care.

Amantadine

An antiviral agent indicated in adults and children >1 year for the treatment of illness due to influenza and for prophylaxis following exposure to influenza type A viruses. It has no effect against the influenza type B virus.

Antibody

Protein molecules that are produced and secreted by certain types of white cells in response to stimulation by an antigen.

Antigen

Any molecule that is recognized by the immune system and that triggers an immune response, such as release of antibodies.

Antigenic drift

A gradual change of the hemagglutinin or neuraminidase proteins on the surface of a

particular strain of influenza virus occurring in response to host antibodies in humans who have been exposed to it. It occurs on an ongoing basis in both type A and type B influenza strains and necessitates ongoing changes in influenza vaccines.

Antigenic shift

The movement of a type A influenza virus strain from other species into humans. The novel strain emerges by reassortment with circulating human influenza strains or by infecting humans directly. Because they flourish in the face of global susceptibility, viruses that have undergone antigenic shift usually create pandemics.

B

Bed

(Institutional Bed)

In any institution a “bed” includes infrastructure support, including staffing, that is required to care for the patient in that bed. Therefore the requirements for a bed in an intensive care unit, for example, include all the support required for a patient to be cared for at that level.

C

Case weight

A measure representing the relative resources consumed by different types of hospital cases, distinguishing simple from complex cases.

CCMOH

Council of Chief Medical Officers of Health*

CDC

United States Centers for Disease Control and Prevention, a federal agency of the United States Department of Health and Human Services

CDPE

Center for Disease Prevention and Epidemiology

CEPR

Centre for Emergency Preparedness and Response (Public Health Agency of Canada)*

CIDPC

Centre for Infectious Disease Prevention and Control (Public Health Agency of Canada)*

CLSN

Canadian Laboratory Surveillance Network

CPHLN

Canadian Public Health Laboratory Network

Cross-resistance

The development of strains of a pathogen that not only withstands the effects of a given antimicrobial agent, but other chemically related agents as well.

D**DFA**

Direct fluorescent antibody

E**EHS**

Emergency Health Services*

EIA

Enzyme immunoassay

Epidemic

An outbreak of infection that spreads rapidly and affects many individuals in a given area or population at the same time.

Epidemiology

The study of the distribution and determinants of health-related states or events in specified populations, and the application of this study to control of health problems.⁽¹⁾

ESS

Emergency Social Services*

F**Flu**

Another name for influenza infection, although it is often mistakenly used in reference to gastrointestinal and other types of clinical illness.

F/P/T

Federal, Provincial and Territorial governments (noun)* or Federal, Provincial and Territorial (adjective)

G**Goblet cell**

A mucous gland in the epithelial lining of specific mucus-secreting passages of the respiratory tract. Mucigen droplets swell the upper portion of the cell, giving it a goblet-like shape.

H**H1N1**

A strain of influenza type A virus that caused the pandemic infection of 1918-1919 and that continues to circulate in humans.

H3N2

A strain of influenza type A virus that caused the pandemic infection of 1968-1969. Of the three influenza viruses that currently circulate in humans, this type causes the greatest morbidity and mortality.

H5N1

A strain of influenza type A virus that moved in 1997 from poultry to humans. While the outbreak of this virus was rapidly contained, it produced significant morbidity and mortality in persons who became infected, probably from direct contact with infected poultry. In 2003 a slightly different strain of H5N1 started circulating in avian species in Asia. As of 2005 this strain has become virtually endemic in the avian population, has infected other species such as swine and felines and has resulted in several fatal human cases.

Health Care Worker

(HCW) with close patient contact

Persons who work in settings where essential health care is provided and who during the pandemic would be working within 1 meter of any patients/residents with or without personal protective equipment.

Note: This definition was developed to facilitate pandemic planning regarding the identification of

specific groups that may be targeted as part of the antiviral and vaccine strategies. It has been endorsed by the Pandemic Influenza Committee for this purpose but may not be well recognized outside of this group.

Health Care Worker

(HCW) without close patient contact

Persons who work in settings where essential health care is provided and who during the pandemic would not be expected to work within 1 meter of any patients/residents.

Note: This definition was developed to facilitate pandemic planning regarding the identification of specific groups that may be targeted as part of the antiviral and vaccine strategies. It has been endorsed by the Pandemic Influenza Committee for this purpose but may not be well recognized outside of this group.

Health status

The state of health of an individual or a population, as in community health status.

HECN

Health Emergency Communications Network

Hemagglutinin (H)

An agglutinating protein antigen spiking from the surface of the influenza virus. Differences in the amino acid sequencing of the HA antibody give rise to the different subtypes of type A virus (e.g. H1, H2, H3).

High-risk groups

Those groups in which epidemiological evidence indicates there is an increased risk of contracting a disease.

IFA

Immunofluorescence assay

IHR

International Health Regulations

ILI

Influenza-like illness

IMPACT

Immunization Monitoring Program, ACTive: a paediatric surveillance network

Inactivated vaccine

A vaccine prepared from killed viruses that no longer retain their infective properties.

Influenza

A highly contagious, febrile, acute respiratory infection of the nose, throat, bronchial tubes, and lungs caused by the influenza virus. It is responsible for severe and potentially fatal clinical illness of epidemic and pandemic proportions.

Influenza type A

A category of influenza virus characterized by specific internal proteins and further subgrouped according to variations in their two surface proteins (hemagglutinin and neuraminidase). It infects animals as well as humans and has caused the pandemic influenza infections occurring in this century.

Influenza type B

A category of influenza virus characterized by specific internal proteins. It infects only humans, causes less severe clinical illness than type A, and spreads in regional rather than pandemic outbreaks.

Influenza type C

A category of influenza virus characterized by specific internal proteins. It does not cause significant clinical illness.

Interpandemic Period

The interval between the last pandemic and the onset of the Pandemic Alert Period. During this period no new virus subtypes have been detected in humans although an influenza virus subtype that has caused human infection may be present in animals.

Infection

Condition in which virulent organisms are able to multiply within the body and cause a response from the host's immune defences. Infection may or may not lead to clinical disease.

Infectious

Capable of being transmitted by infection, with or without actual contact.

Inpatient

An individual who receives health care services while admitted in a health care facility overnight or longer.

InterQual criteria

See also Alternate level of care

A set of measurable clinical indicators, as well as diagnostic and therapeutic services, reflecting the need for hospitalization. Rather than being based on diagnosis, they consider the level of illness of the patient and the services required; thus they serve as the criteria for all acute hospital care, regardless of location or size of the hospital. The criteria are grouped into 14 body systems, and there are three sets of criteria for each body system: Severity of Illness, Intensity of Service, and Discharge Screens.

Isolate

A pure specimen obtained by culture.

Isolation

(as used in epidemiology)

Separation, for the period of communicability, of infected persons or animals from others in such places and under such conditions as to prevent or limit the direct or indirect transmission of the infectious agent from those infected to those who are susceptible or who may spread the agent to others.⁽¹⁾

K

Key health sector decision makers

Persons whose decision-making authority is necessary for implementing and maintaining the health sector response to pandemic influenza.

Note: This definition was developed to facilitate pandemic planning regarding the identification of specific groups that may be targeted as part of specific public health interventions. It has been endorsed by the Pandemic Influenza Committee for this purpose but may not be well recognized outside of this group.

Key social sector decision makers

Persons whose decision making authority will be necessary at the time of the pandemic to minimize societal disruption.

Note: This definition was developed to facilitate pandemic planning regarding the identification of specific groups that may be targeted as part of specific public health interventions. It has been endorsed by the Pandemic Influenza Committee for this purpose but may not be well recognized outside of this group.

L

LICO (*Low income cutoff point*)

The proportion of people in low-income households to the total population in private households. LICOs are set where families spend 20 percent more of their pre-tax income than the Canadian average on food, shelter and clothing. The LICO takes into account changes in the Consumer Price Index of the area and gives various LICOs according to different family sizes.

LPN (*Licensed practical nurse*)

A nursing school graduate who has been licensed by a provincial or territorial body; occasional synonym, licensed vocational nurse.

M

MD (*Doctor of Medicine*)

An individual holding a doctoral degree in medicine.

Medline

Medical Literature Analysis Retrieval System on Line. A computer searchable database of published medical literature.

Mean (*statistical*)

Commonly referred to as the “average,” the mean of a set of quantities is the sum of the quantities, divided by the number of quantities summed.

Median (*statistical*)

The value such that for a series of ranked quantities, half are above the median, and half are below.

Morbidity

Departure from a state of well-being, either physiological or psychological; illness.

Morbidity rate

The number of cases of an illness (morbidity) in a population divided by the total population considered at risk for that illness.

Mortality

Death, as in expected mortality (the predicted occurrence of death in a defined population during a specific time interval).

Mortality rate

The number of people who die during a specific time period divided by the total population.

Mutation

A permanent, transmissible change in the genetic material of a cell.

N

NPS

Nasopharyngeal swab

Neuraminidase (N)

A hydrolytic protein antigen spiking from the surface of the influenza virus. It dissolves the protective viscosity of cellular mucous lining, allowing release of new viruses into the respiratory tract. The different proteins are identified using a numerical system (e.g., N1, N2, N3) and when combined with the haemagglutinin type are used to identify various influenza virus subtypes (e.g. H1N1, H3N2)

Neuraminidase inhibitors

A new class of antiviral agents that selectively inhibit neuraminidase activity in both influenza type A and type B viruses, while having no effect on human neuraminidase.

Non-traditional site

The following is a definition of a Non-Traditional Site for the purposes of Pandemic Influenza planning: A Non-Traditional Site is a site offering care for influenza patients. These sites are currently not an established health care site, or are established sites which usually offer a different type or level of care. The functions of a non-traditional site will vary depending on the needs of the community but will focus on monitoring, care and support of influenza patients.

O

Opportunistic infections

An infection in an immune compromised person caused by an organism that does not usually cause disease in healthy people. Many of these organisms are carried in a latent state by virtually everyone, and only cause disease when given the opportunity of a damaged immune system.

Outpatient

An individual who receives health care services without being admitted to a health care facility.

P

PAHO

Pan American Health Organization.

Palliative

A treatment that provides symptomatic relief, but not a cure.

p value

The probability of obtaining a given outcome due to chance alone. For example, a study result with a significance level of $p < 0.05$ implies that five times out of 100 the result could have occurred by chance.

Pandemic

Referring to an epidemic disease of widespread prevalence around the globe.

Pandemic Alert Period

The interval following the Interpandemic Period. Characterized by the occurrence of human infection(s) with a new subtype of influenza virus in the absence of efficient human to human transmission of this new virus.

Pandemic Period

The interval characterized by increased and sustained transmission in the general population of a new influenza virus subtype which is spreading efficiently between humans.

Pandemic societal responders

Persons who are trained or primarily involved in the provision of an essential service that if not sustained at a minimal level would threaten public health, safety or security.

Note: This definition was developed to facilitate pandemic planning regarding the identification of specific groups that may be targeted as part of specific public health interventions. It has been endorsed by the Pandemic Influenza Committee for this purpose but may not be well recognized outside of this group.

Parenteral

Not through the mouth. Intravenous, intramuscular, and intradermal administration are all parenteral.

Pathogen

Any disease-producing microorganism or material.

Pathogenesis

The natural evolution of a disease process in the body without intervention (i.e., without treatment). Description of the development of a particular disease, especially the events, reactions and mechanisms involved at the cellular level.

PCR (*Polymerase chain reaction*)

A highly sensitive test that can detect and/or DNA fragments of viruses or other organisms in blood or tissue. PCR works by repeatedly copying genetic material using heat cycling, and enzymes similar to those used by cells.

Pediatric

Relating to the medical specialty concerned with the development, care and treatment of children from birth through adolescence.

PHAC

Public Health Agency of Canada

PHEIC

Public health emergency of international concern

PHL

Provincial health laboratory

PIC

Pandemic Influenza Committee the Plan Canadian Pandemic Influenza Plan for the Health Sector

Pneumocyte

An alveolar epithelial cell in the lungs.

Preventive care

A comprehensive type of care emphasizing priorities for prevention, early detection and early treatment of conditions, generally including routine physical examinations, immunization, and well-person care.

Preventive medicine

Taking measures for anticipation, prevention, detection, and early treatment of disease.

Primary care

Primary care is the first level of care, and usually the first point of contact, that people have with the health care system. Primary care involves the provision of integrated, accessible health care services by clinicians who are accountable for addressing a large majority of personal health care

needs, developing a sustained partnership with patients, and practicing in the context of family and community. It includes advice on health promotion and disease prevention, assessments of one's health, diagnosis and treatment of episodic and chronic conditions, and supportive and rehabilitative care.

PSEPC

Public Safety and Emergency Preparedness Canada.

P/T

Provincial and Territorial governments (noun) and Provincial and Territorial (adjective).

Public health

The art and science of protecting and improving community health by means of preventive medicine, health education, communicable disease control, and the application of social and sanitary sciences.

Public Health Responders

Persons who are essential to the implementation and maintenance of the public health response to pandemic influenza and who would not be expected to come within 1 meter of a known influenza case in their work setting.

Note: This definition was developed to facilitate pandemic planning regarding the identification of specific groups that may be targeted as part of specific public health interventions. It has been endorsed by the Pandemic Influenza Committee for this purpose but may not be well recognized outside of this group.

PYLL (*Potential years of life lost*)

The PYLL rate per 1000 population is the ratio of the total years of life lost between ages 0 and 75 due to a specific cause to the total population. The cause of death selected is the underlying cause of death, which is the cause that initiated the sequence of events leading to death.

Q

Qualitative

Of, relating to, or expressed in relative or subjective terms. Impossible to quantify precisely.

Quantitative

Of, relating to, or expressed in terms of quantity.

R

Raw data

Measurements and observations recorded on study data forms. 2. Unedited computer-generated listings of data from study data forms, prior to use of reduction and summary procedures needed for data analysis.

Record

A paper or electronic document that contains or is designed to contain a set of facts related to some occurrence, transaction, or the like.

Resistance

The development of strains of a pathogen that are able to withstand the effects of an antimicrobial agent.

Respiratory epithelium

The pseudostratified coverup of internal body surfaces, which lines all but the finer divisions of the respiratory tract.

Respiratory tract

Structures contained in the respiratory system, including the nasopharynx, oropharynx, laryngopharynx, larynx, trachea, bronchi, bronchioles, and lungs.

Rimantadine

An antiviral agent indicated in adults for the treatment of illness due to influenza and for prophylaxis following exposure to influenza type A viruses. It has no effect against the influenza type B virus.

RN (*Registered Nurse*)

One who has graduated from a college or university program of nursing education and has been licensed by the state.

services of specialists whose services are only available in major urban centres; this level of service would normally be considered tertiary care.

Significance (*statistical*)

Infers that an observation was unlikely to have occurred by chance alone. Statistical significance is often based on a p value < 0.05 . Below this level, the smaller the p value, the greater the statistical significance.

Standard deviation (*statistical*)

A statistic that shows the spread or dispersion of scores in a distribution of scores (i.e. a measure of dispersion). The more widely the scores are spread out, the greater the standard deviation. Standard deviation = the square root of the variance.

Statistics, descriptive

The intent of descriptive statistics is to summarize and present data, e.g. measures of central tendency (mean, mode, median) and measures of variability (standard deviation, variance, standard error of the mean).

STD

Sexually transmitted disease.

Strain

A group of organisms within a species or type that share a common quality. For example, currently circulating strains of influenza include type A (H1N1), type A (H3N2), and type B (H3N2).

Subacute care

Comprehensive, cost-effective inpatient level of care for patients who: (a) have had an acute event resulting from injury, illness or exacerbation of a disease process, (b) have a determined course of treatment, and (c) although stable, require diagnostics or invasive procedures but not intensive procedures requiring an acute level of care. Typically short-term, subacute care is designed to return patients to the community or transition them to a lower level of care. Subacute care is offered in a variety of physical settings. The philosophy of subacute care is to ensure that patients are receiving the most appropriate services at the most appropriate phase of their illness while ensuring quality, cost-effective outcomes.

S

SARS

Severe acute respiratory syndrome

Secondary care

Services given by a specialist, normally after a referral from a primary care physician, and often in an acute care hospital. It does not include the

Subtype

A classification of the influenza type A viruses based on the surface antigens hemagglutinin (H) and neuraminidase (N).

Symptoms

Any perceptible, subjective change in the body or its functions that indicates disease or phases of disease, as reported by the patient.

T

TAG

Technical Advisory Group

TCIF

Traveller contact information form

Toxicity

The extent, quality, or degree of being poisonous or harmful to the body.

Toxin

A harmful or poisonous agent.

Triage

A system whereby a group of casualties or patients is sorted according to the seriousness of their illness or injuries, so that treatment priorities can be allocated between them. It is designed to maximize the number of survivors in emergency situations.

Type A

classification of influenza viruses based on characteristic internal proteins.

V

Vaccination

The act of administering a vaccine.

Vaccine

A substance that contains antigenic components from an infectious organism. By stimulating an immune response (but not disease), it protects against subsequent infection by that organism.

Virology

The study of viruses and viral disease.

Virus

A group of infectious agents characterized by their inability to reproduce outside of a living host cell. Viruses may subvert the host cells' normal functions causing the cells to behave in a manner determined by the virus.

Volunteers (*Pandemic*)

A volunteer is a person registered with a government agency or government designated agency, who carries out unpaid activities, occasionally or regularly, to help support Canada prepare for and respond to a pandemic influenza outbreak. A volunteer is one who offers their service of their own free will, without promise of financial gain, and without economic or political pressure or coercion.

W

WHMIS

The Workplace Hazardous Materials Information System (WHMIS) is Canadian legislation covering the use of hazardous materials in the workplace. This includes assessment, signage, labelling, material safety data sheets and worker training. WHMIS closely parallels the U.S. OSHA Hazcom Standard. Most of the content of WHMIS is incorporated into Canada's *Hazardous Products Act and the Hazardous Materials Information Review Act*, which are administered by Health Canada. Certain provincial laws may also apply. WHMIS is enforced by the Labour Branch of Human Resources Development Canada or the provincial and territorial agencies and offices of occupational health and safety.

Wild type

A naturally occurring strain of virus that exists in the population.

WHO

World Health Organization, a special agency of the United Nations generally concerned with health and health care.

References

1. Last, John, M. (Editor) *A Dictionary of Epidemiology* (2nd edition), 1988. Oxford University Press Inc., New York, New York.