



# British Columbia's H1N1 Pandemic Influenza Response Plan (2009)

## Public Health Measures – Technical Document *Overview*

*February 16, 2010*

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# 1. INTRODUCTION

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This plan summarizes the evidence for the range of measures that can be used in the community to reduce the transmission of infection during a pandemic, collectively known as public health measures, and makes recommendations for British Columbia based on this evidence. Evidence-based decision making often refers strictly to efficacy or effectiveness of an intervention as determined by rigorous clinical studies. For many public health measures this level of evidence is lacking and in many cases recommendations are based on observational data, modelling and expert opinion. In addition, this paper considers other factors that are important in implementation of broad-based restrictions such as ethical considerations, values, cost and feasibility in evaluating the range of possible responses to public health threats. Recommendations are made based on a balance between:

1. **Efficacy** – How well the intervention theoretically works to prevent the transmission of influenza from one individual to another; conclusions are drawn from analysis of past epidemics, prospective trials or modelling studies.
2. **Cost-effectiveness** – The extent to which the intervention will have an effect large enough to justify its cost (both social and economic), or whether resources would achieve greater results if directed to alternate interventions.
3. **Values and Ethics** – How the intervention balances public health and individual freedoms and reflects the cultural and social mores of the target population, or puts undue burdens on specific populations.
4. **Feasibility of Implementation** – The potential of the intervention to be adopted and disseminated quickly throughout the community in order to have the desired impact.

This document is written for public health professionals to aid them in their own local decision-making process and to explain the rationale for provincial direction on these issues. It attempts to set out the conditions where certain measures might be considered given the attack rates, virulence and timing of the pandemic, particularly in relation to availability of antiviral medications and vaccine.

## 2. GOAL STATEMENT AND OBJECTIVES

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### 2.1 Goal Description

The overall goals of the BC H1N1 Pandemic Influenza Response Plan are to minimize serious illness and overall deaths, and to

minimize societal disruption caused by the pandemic.

### 2.2 Objectives

1. To delay the spread of the pandemic influenza strain, thereby gaining time to prepare and implement medical countermeasures.
2. To minimize the peak attack rate, thereby decreasing the potential burden on the health care system during the local epidemic peak.

### 3. ASSUMPTIONS AND PLANNING SCENARIOS

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Certain high-level assumptions have been used when planning for an influenza pandemic, based on a combination of experience from the 1957 and 1968 pandemics and on the experience with avian influenza H5N1 in the past decade.

The following assumptions were used to generate this document:

1. *The pandemic will be of moderate intensity.*  
While the impact of the pandemic virus cannot be accurately predicted, it is prudent to plan that it will be of moderate to severe intensity level. Planning for less than that level would potentially underestimate the resources and actions needed. On the other hand, planning for a severe pandemic of the 1918 variety would require a major investment of resources, which would likely overwhelm the present public health infrastructure.
2. *The duration in each region will be 8 weeks and up to 12 weeks for the entire province.*  
The conventional duration of an influenza epidemic is on average 8 weeks. Most of the planning is for dealing with the first pandemic wave of 8 weeks.
3. *The pandemic will originate outside of Canada and will take one to three months time before it reaches B.C.*

Based on past pandemics and the current prevalence of the H5N1 virus, which has long been thought to be the most likely candidate for the next severe pandemic virus, it was expected that the pandemic would begin outside of North America. It has also been expected and assumed that despite activities such as quarantine and other public health measures, the virus would reach our setting in one to three months. Based on the H1N1 experience in 2009, however, this assumption is no longer valid. The pandemic H1N1 strain emerged in Mexico and the United States in April 2009 and rapidly spread across North America within weeks. Therefore the recommendations in this document are specific to H1N1 and are not based on the previous assumptions.

4. *Vaccines will not be available at the start of the pandemic and perhaps through the entire first wave.*  
At the start of the pandemic, vaccine will not be available and it may take six months until a vaccine has been produced. Canada has a contract with GlaxoSmithKline to produce vaccine for the entire Canadian population, but it may take time for the vaccine to become available.

### 4. PUBLIC HEALTH MEASURES: RECOMMENDATIONS

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#### 4.1 Summary of Public Health Measures Recommendations

Analyses of data from the 1918 influenza pandemic indicate that public health measures may have been effective when implemented early and sustained for several weeks (Bootsma & Ferguson, 2007; Markel et al., 2007). For the most part, however, such analyses considered a number of widespread measures that were

implemented at the same time and are not able to isolate those measures that worked best to reduce peak and overall mortality.

Table 1 summarizes the recommendations for the various public health measures that can be used in the community to reduce the transmission of infection during pandemic

H1N1 influenza. More information on the public health measures can be found in separate

Annex documents (these are listed in the Appendices section).

**Table 1 Summary Table of Public Health Measure Recommendations Regarding Pandemic H1N1 Influenza**

Public Health Measure	Pandemic H1N1 Recommendations
<i>Public Health Communications</i>	
	<ul style="list-style-type: none"> <li>It is <u>recommended</u> that the rationale for each public health measure that is proposed or implemented be communicated to the public, including the ethical framework that guided the decision process.</li> </ul>
<i>ANNEX A: Measures to Reduce Risk of Transmission of Infection</i>	
Isolation	<ul style="list-style-type: none"> <li>It is <u>recommended</u> that people with influenza-like-illness, regardless of diagnosis or laboratory testing results, be advised to self-isolate while they are symptomatic.</li> <li>It is <u>recommended</u> that the duration of isolation be until symptoms have resolved and the person is able to fully participate in normal daily activities.</li> <li>It is <u>recommended</u> that isolated patients and household contacts be referred to HealthLinkBC for further up-to-date guidance. Such guidance should include instructions surrounding use of separate bedrooms and bathrooms, use of masks, and household cleaning. Isolated patients should avoid going out in public without a mask.</li> </ul>
Face Masks – For Symptomatic Persons	<ul style="list-style-type: none"> <li>It is <u>recommended</u> that symptomatic individuals wear face masks when around others in the household or if they must go out in public, for the purpose of decreasing outward transmission to others. Preferably they should self-isolate. Surgical masks and N95 respirators being equivalent in this regard, surgical masks are recommended.</li> </ul>
Face Masks – For Exposed Persons	<ul style="list-style-type: none"> <li>It is <u>not recommended</u> that exposed but <i>asymptomatic</i> individuals wear a mask.</li> </ul>
Face Masks – For Well Individuals	<ul style="list-style-type: none"> <li>It is <u>recommended</u> that people ill with influenza-like illness wear a face mask when the caregiver is in the room, and that caregivers wear a face mask when providing care within 2m of a symptomatic patient who is unable to wear a face mask.</li> <li>It is <u>not recommended</u> that well individuals who lack close patient contact wear masks. Ongoing hand hygiene for everyone and cough hygiene/masks for symptomatic individuals are more likely to be effective. There is no evidence of effectiveness for well people to wear masks in public places and this is not recommended.</li> </ul>
<i>ANNEX B: Measures to Reduce Risk that Contacts Transmit Infection</i>	
Contact Tracing and Follow-up	<ul style="list-style-type: none"> <li>It is <u>not recommended</u> that a public health approach of contact tracing be pursued as a containment measure for influenza.</li> </ul>
Voluntary Quarantine of Healthy Contacts	<ul style="list-style-type: none"> <li>It is <u>not recommended</u> that asymptomatic exposed individuals be quarantined. Early isolation if exposed individuals become ill should be the focus.</li> </ul>
Self-Monitoring of Symptoms and Reporting of Illness	<ul style="list-style-type: none"> <li>While it is appropriate for people to be aware of their health and seek early assessment and self-isolate if they do develop fever and cough, it is <u>not recommended</u> that they report to any public health authority in this regard.</li> </ul>

Public Health Measure	Pandemic H1N1 Recommendations
Advise Contacts to Defer Travel to Unaffected Areas	<ul style="list-style-type: none"> <li>• It is <u>not recommended</u> that contacts defer travel to unaffected areas for public health reasons, though personal reasons may lead to such a decision for some people.</li> </ul>
<b><i>ANNEX C: Measures to Increase Social Distance</i></b>	
Closure of Schools	<ul style="list-style-type: none"> <li>• Widespread proactive school closures are <u>not recommended</u> given the balance of virulence in a particular age group and the social and economic impact of closures. Proactive school closures should only be considered if there is increased virulence in the school-aged population and mitigation programs could be implemented to overcome the economic and social consequences. This consideration should be taken in the context of widespread community and workplace closures as a method to blunt transmission until a vaccine is available.</li> <li>• It is <u>not recommended</u> that schools be reactively closed based on any particular number of cases among students or staff. While it is recognized that, if implemented, early closures are likely be more effective than later closures, it is also important to consider the potential impact of closures in terms of shifting the locus of transmission to other community sites.</li> <li>• It is <u>recommended</u> that voluntary withdrawal (self-isolation) of symptomatic individuals from schools occur just as with any other symptomatic individuals.</li> </ul>
Population-Wide Measures to Reduce Mixing of Adults	<ul style="list-style-type: none"> <li>• It is <u>not recommended</u> that workplaces be closed. Focus should be on self-isolation of ill workers, ill workers staying home, hand hygiene and cough etiquette in the workplace and enhanced environmental cleaning.</li> <li>• It is <u>not recommended</u> that mass gatherings be cancelled. While there appears to be broad public acceptance of the need to personally avoid mass gatherings, there is scant evidence to suggest that cancelling such gatherings brings additional benefit. It is suggested, though, that organizers of such gatherings continue to reiterate appropriate public messaging regarding hand hygiene, cough etiquette, ill people staying home and basic social distancing concepts.</li> </ul>
<b><i>ANNEX D: Measures to Decrease Interval Between Symptom Onset and Patient Isolation</i></b>	
Public Campaign to Encourage Prompt Self-Diagnosis	<ul style="list-style-type: none"> <li>• It is <u>recommended</u> that educational campaigns not only stress the importance of hand hygiene and cough etiquette but also the need for prompt self-diagnosis. Case definition, warning signs to watch for, directions regarding further assessment and treatment, self-care, follow-up, and how to obtain more information are aspects that need to be covered in messaging.</li> </ul>

Public Health Measure	Pandemic H1N1 Recommendations
Screening for Fever	<ul style="list-style-type: none"> <li>• It is <u>not recommended</u> that individuals take their own temperature in the absence of a subjective feeling of fever or other influenza symptom, but prompt self-diagnosis is encouraged if symptoms are noted.</li> <li>• It is <u>not recommended</u> that thermal scanning be established in public settings.</li> </ul>
Set up Fever Telephone Hotlines with Ambulance Response	<ul style="list-style-type: none"> <li>• It is <u>recommended</u> that telephone hotlines staffed by registered nurses be employed to assist callers in self-diagnosis and self-management.</li> <li>• It is <u>not recommended</u> that telephone hotlines serve to dispatch ambulances to those with influenza.</li> </ul>
<b><i>ANNEX E: Disinfection Measures</i></b>	
Hand Hygiene	<ul style="list-style-type: none"> <li>• It is <u>recommended</u> that hand washing with soap and water or the use of alcohol-based hand rubs be strongly encouraged. Antibiotic soaps are not necessary. A communications strategy that emphasizes the proper use of each of these products should be adopted.</li> </ul>
Set up Hand Sanitizing Stations in Public Settings	<ul style="list-style-type: none"> <li>• It is <u>not recommended</u> that alcohol-based hand rubs be installed in uncontrolled public settings. Private institutions and companies are encouraged to consider such measures for their own sites where hand hygiene stations can be more easily monitored and maintained.</li> </ul>
Cleaning of Surfaces in Public Settings	<ul style="list-style-type: none"> <li>• It is <u>not recommended</u> that there be specific cleaning measures undertaken in uncontrolled public settings. Private institutions and companies are encouraged to consider such measures for their own sites, particularly in high touch areas such as food courts, elevators and washrooms.</li> </ul>
Household Disinfection of Potentially Contaminated Surfaces	<ul style="list-style-type: none"> <li>• It is <u>recommended</u> that frequently touched surfaces in the homes of infected individuals be disinfected 2-3 times per day. Such surfaces include doorknobs, countertops, telephones and faucets, among others. Routine household cleaners are effective against influenza, including pandemic H1N1 influenza.</li> </ul>
Air Disinfection	<ul style="list-style-type: none"> <li>• It is <u>not recommended</u> that air disinfection approaches be taken, given insufficient evidence of effectiveness.</li> </ul>
<b><i>ANNEX F: Measures for Persons Travelling Within the Country</i></b>	
Avoid Contact with High-Risk Environments	<ul style="list-style-type: none"> <li>• It is <u>recommended</u> that the public limit visits to swine and poultry farms, and that symptomatic individuals be restricted from visiting/working in swine/poultry farms. There should be adherence to current Canadian Food Inspection Agency recommendations.</li> <li>• It is <u>recommended</u> that advice be provided to people with underlying health conditions that put them at high risk of severe disease or complications from influenza to consider avoiding uncontrolled situations like crowds where they may have a higher risk of exposure to influenza when the pandemic strain is circulating in their community.</li> </ul>
Recommend Deferral of Non-Essential Travel to Affected Areas	<ul style="list-style-type: none"> <li>• It is <u>not recommended</u> that travel advisories be issued. Such advisories are usually intended to protect individuals. Persons at risk may consider deferral of travel for personal reasons.</li> </ul>



Public Health Measure	Pandemic H1N1 Recommendations
Cordon Sanitaire/Travel Restrictions	<ul style="list-style-type: none"> <li>It is <u>not recommended</u> that travel restrictions be implemented in British Columbia. The purpose of travel restrictions is usually to prevent the importation of disease.</li> </ul>
Disinfect Clothing, Shoes and Other Objects of Persons Exiting Affected Areas	<ul style="list-style-type: none"> <li>It is <u>not recommended</u> that a general disinfection of clothing or footwear or vehicles take place. Routine washing of clothing and linens is sufficient for individuals ill from pandemic H1N1 influenza. Specific situations such as may be faced by farmers are addressed in Canadian Food Inspection Agency guidelines.</li> </ul>

## 4.2 Public Health Communications

Communication specific to public health measures during an influenza pandemic should be integrated within the overall communications strategy of the BC Pandemic Influenza Preparedness Plan. The communications plan outlines the communications goals (coordinating actions between agencies, keeping the public well-informed, etc.) and specific communications strategies to be employed (website, press conferences, etc.).

Evidence from the academic literature suggests that, as many public health measures require temporary (self)-restriction of certain activities, communicating the reasoning behind decisions

is both an ethical duty and a means of promoting public support (Cetron & Landwirth, 2005). In fact, surveys suggest that the public is more likely to be supportive of given measures if they are voluntary and well-justified rather than mandatory and enforced (Blendon et al., 2006; Lau, Kim, Tsui, & Griffiths, 2007).

### Recommendation

- It is recommended that the rationale for each public health measure that is proposed or implemented be communicated to the public, including the ethical framework that guided the decision process.

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## APPENDICES

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### List of Public Health Measures Annex Documents

Annex A	Measures to Reduce Risk of Transmission of Infection
Annex B	Measures to Reduce Risk that Contacts Transmit Infection
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## Annex A: Measures to Reduce Risk of Transmission of Infection

### Introduction

This document discusses why measures to reduce risk of transmission of infection should be considered as part of pandemic planning, and identifies the range of measures for which consideration and planning are needed.

### Isolation

#### Evidence and Considerations

For centuries, isolation of symptomatic individuals has been a cornerstone of the public health response to disease. In regards to influenza, it is almost uniformly recommended (Carrat et al., 2006; Ferguson et al., 2006; Wu, Riley, Fraser, & Leung, 2006; Aledort, Lurie, Wasserman, & Bozzette, 2007; Haber et al., 2007; Jefferson et al., 2009; Halloran et al., 2008; Kerneis, Grais, Boelle, Flahault, & Vergu, 2008; one exception, Hatchett, Mecher, & Lipsitch's (2007) finding that isolation was not significant in decreasing the 1918 pandemic, was likely due to low compliance with the measure).

Isolation is most effective if applied early (Halloran et al., 2008; Kerneis et al., 2008) and rescinded late (Duerr et al., 2007), if encouraged without waiting for laboratory confirmation (Jefferson et al., 2009), and if isolated individuals separate themselves from other household members (Collignon & Carnie, 2006; Ferguson et al., 2006). Mandatory isolation is not recommended due to ethical concerns and issues with enforcement and overcrowding of health facilities (Aledort et al., 2007). Ideally, according to expert opinion, all household members should wear masks and the symptomatic individual should have a separate bedroom and bathroom. Recent household studies have indicated that transmission to others is reduced if the ill person routinely wears a face mask (McIntyre et al., 2009). Household surfaces that are touched frequently should be cleaned and disinfected regularly. The isolation period should normally last until

symptoms are resolved. Virus shedding is greater when people are symptomatic but has been observed to last longer in immunocompromised individuals, and so longer periods of isolation should be considered in these cases (Leekha et al., 2007).

#### Pandemic H1N1 Recommendations

- It is recommended that people with influenza-like-illness, regardless of diagnosis or laboratory testing results, be advised to self-isolate while they are symptomatic.
- It is recommended that the duration of isolation be until fever, if present, has resolved and the person is able to fully participate in normal daily activities.
- It is recommended that isolated patients and household contacts be referred to HealthLinkBC for further up-to-date guidance. Such guidance is likely to include instructions surrounding use of separate bedrooms and bathrooms, use of masks, and household cleaning. Isolated patients should avoid going out in public without a mask.

### Face Masks – For Symptomatic Persons

#### Evidence and Considerations

The wearing of masks by symptomatic individuals is a well-accepted practice to decrease the transmission of influenza (Collignon & Carnie, 2006; Bick, 2007; Jefferson et al., 2009), but not all masks are equally effective. Surgical masks and N95 respirators are both effective and are roughly equivalent in preventing the outward transmission of disease (Jefferson et al., 2009; van der Sande, Teunis, & Sabel, 2008), but surgical masks are less expensive and more comfortable. N95 respirators with expiratory valves should not be used for this purpose. Homemade masks are not recommended for

this purpose as they confer very little outward protection (van der Sande et al., 2008).

### Pandemic H1N1 Recommendations

- It is recommended that symptomatic individuals wear face masks when around others in the household or if they must go out in public, for the purpose of decreasing outward transmission to others. Preferably they should self-isolate.

### **Face masks – For Exposed Persons**

#### Evidence and Considerations

As influenza can be transmitted by a person before he or she is symptomatic (Carrat et al., 2008), control measures aimed solely at symptomatic individuals may not be sufficient to control the spread of the disease. There is evidence, however, to suggest that infectious individuals without symptoms shed less virus than those who are symptomatic, and are therefore less likely to infect others (Carrat et al., 2008). The decision to recommend masks for exposed persons, therefore, will depend on the characteristics of the pandemic strain, particularly the degree to which transmission occurs before symptoms are apparent. As for symptomatic individuals, surgical masks provide adequate outward protection (van der Sande et al., 2008).

If, based on emerging epidemiology, masks are recommended for asymptomatic exposed individuals, it would likely be in the context of the entire population being advised to do so regardless of exposure history. The potential benefit of having only those who recognize exposure wear a mask (in the context of widespread community transmission) will be diluted by the large numbers who do not recognize their exposure and do not wear a mask despite having been exposed.

### Pandemic H1N1 Recommendations

- It is not recommended that exposed but asymptomatic individuals wear a mask.

### **Face Masks – For Well Individuals**

#### Evidence and Considerations

Recommendations for mask use by well individuals must be based on analysis of the risk faced by people in specific environments. Well individuals providing care to those who are ill, for example, face a much higher risk of infection than do those interacting with non-symptomatic individuals in the general population. While mask use does lower a person's exposure to the virus, this benefit is marginal in situations where exposure is low at the outset. Issues of fit and compliance drastically affect the level of protection conferred (Weiss et al., 2007).

Some jurisdictions, including Quebec, have recommended mask use for the entire population during an influenza pandemic (Institut national de santé publique du Québec, 2007). This recommendation is based on the assumption that a significant percentage of transmission will occur in public places. The evidence base includes a lone modelling study supporting mask use, but that indicates the type of intervention is less important than the speed with which the intervention is implemented (Kerneis et al., 2008). As well, there is one study showing decreased rates of respiratory illnesses during the SARS outbreak in Hong Kong (Lo et al., 2005). Given the extent of other types of protective behaviours, including isolation and social distancing, that took place during this period, it is premature to conclude that masks should be recommended for the general public. Among the many unknowns with influenza is the correlation between exposure time and subsequent illness. If certain susceptible individuals are likely to be infected during a short exposure while others could be exposed for long periods with no effect, there is much

less benefit in recommending masks than if all individuals are similarly susceptible and duration of exposure is a particularly important risk factor. As a result, it is quite likely public mask use will do very little to protect susceptible individuals (since no mask is 100 percent effective or can be worn 100 percent of the time), will be a burden to those not susceptible, and will increase public fear. It is possible that many in the community will choose to wear masks regardless of government recommendations (Lau et al., 2007).

One situation in which mask use by well individuals can be recommended is in caring for ill individuals. In this situation, unlike in public places, there is a higher probability of exposure to influenza and therefore transmission, and the benefits of mask use are therefore clear (Aledort et al., 2007). There is one randomized controlled trial showing mask-wearing by household contacts does not appreciably lower the secondary attack rate; however, the authors caution that the study was underpowered, there was very low adherence, and the intervention was only implemented after contacts had several days of exposure already (Cowling et al., 2008). There is considerable controversy over whether N95 respirators or surgical masks are most appropriate for this situation. A Cochrane review found no evidence in favour of N95 respirators over surgical masks except in high-risk hospital settings (Jefferson et al., 2009) and neither did a randomized controlled trial of N95 respirator or surgical mask use in households with an ill member (MacIntyre et al., 2009). While some studies suggest any type of mask, including homemade masks, will provide some protection and thus decrease transmission (van der Sande et al., 2008), others argue for the use of N95 respirators, given (limited) evidence that a proportion of influenza transmission might occur by the aerosol route (Tellier, 2006). Other studies suggest the additional comfort of surgical masks over N95 respirators, as measured by air permeability (i.e., ease of breathing) will lead to better compliance (Li et al., 2006), although this conclusion was not

supported by adherence data in a randomized controlled trial (MacIntyre et al., 2009). Wearing a surgical mask over an N95 respirator, as is sometimes suggested to extend the life of the N95 respirator, is not recommended because it increases difficulty in breathing, and thus would decrease compliance (Roberge, 2008).

#### Pandemic H1N1 Recommendations

- It is recommended that people ill with influenza-like illness wear a face mask when the caregiver is in the room, and that caregivers wear a face mask when providing care within 2m of a symptomatic patient who is unable to wear a face mask.
- It is not recommended that well individuals who lack close patient contact wear masks. Ongoing hand hygiene for everyone and cough hygiene/masks for symptomatic individuals are more likely to be effective. There is no evidence of effectiveness for well people to wear masks in public places and this is not recommended.

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## Annex B: Measures to Reduce Risk that Contacts Transmit Infection

### Introduction

This document discusses why measures to reduce the risk that contacts will transmit the infection should be considered as part of pandemic planning, and identifies the range of measures for which consideration and planning are needed.

### Contact Tracing and Follow-up

#### Evidence and Considerations

Contact tracing involves requesting that identified cases generate a list of those individuals with whom they had contact during their infectious period. These individuals may then be offered antiviral prophylaxis, be asked to enter quarantine, or simply be advised to avoid settings where they may transmit to vulnerable people such as health care settings. Both contact tracing and follow-up require a large investment of human resources (MacDougall, 2007), and require a careful balancing of privacy rights and public safety (Gostin, 2006; Torda, 2006). It may not be possible to trace all the contacts of vulnerable populations such as the homeless (Leung et al., 2008). An additional drawback to contact tracing and follow-up is that it depends on the correct identification of a person as having the pandemic strain (Hsieh et al., 2007), which may not be possible if infection is widespread, given limited laboratory resources to make such diagnoses. Modelling suggests that, while contact tracing may be useful in controlling diseases with long incubation periods (such as SARS), its efficacy for influenza would be low to moderate (Fraser, Riley, Anderson, & Ferguson, 2004; Chen, Chaing, & Liao, 2006; Wu, Riley, Fraser, & Leung, 2006). Given these considerations, expert opinion is divided about the effectiveness of contact tracing in the early stages of a pandemic and does not recommend its use in the later stages (Aledort, Lurie, Wasserman, & Bozzette, 2007). Australia,

however, does plan to request that all arriving travellers complete contact information cards to assist in reaching them should another passenger prove to have been infectious (Horvath, McKinnon, & Roberts, 2006).

Contact tracing may also be used for research purposes to investigate, for example, the average number of secondary cases generated from a primary case ( $R_0$ ) or the effectiveness of antiviral prophylaxis in preventing secondary cases.

#### Pandemic H1N1 Recommendations

- It is not recommended that a public health approach of contact tracing be used as a containment measure for influenza. This type of containment measure has not been effective for pandemic H1N1 in North America.

### Voluntary Quarantine of Healthy Contacts

#### Evidence and Considerations

Quarantining the healthy contacts of infected individuals should be effective in mitigating the pandemic if the following three conditions are met:

1. The disease is effectively transmitted in the incubation or early symptomatic stage;
2. It is practical and possible to identify the majority of exposed individuals within the incubation period; and
3. Infected people comply with quarantine conditions (Schabas, 2007).

Extensive models have been created in which each of these conditions is met to various degrees; generally, these models have concluded that quarantine is most effective for influenza when implemented along with a suite of other pharmaceutical and non-pharmaceutical interventions, when recommended early in the

pandemic, and when  $R_0 \leq 2.0$  (Longini et al., 2005; Carrat et al., 2006; Germann, Kadau, Longini, & Macken, 2006; Wu et al., 2006; Haber et al., 2007; Halloran et al., 2008). Based on these models, quarantine might at best have the impact of decreasing the peak attack rate and extending the duration of the pandemic; if it was feasible to implement it might be most usefully recommended as a measure to slow the pandemic until a vaccine can be produced (Germann et al., 2006).

Compliance with quarantine benefits the community but can be detrimental and impinges on the rights of the individual. In consequence, several ethical dilemmas arise in conjunction with consideration of quarantine. First, given that the single largest risk factor for contracting influenza is having a household member with the illness; it is problematic to recommend confining healthy contacts with symptomatic individuals unless excellent infection control and/or antiviral prophylaxis are implemented concomitantly (Ferguson et al., 2006). Second, there are financial implications to recommending quarantine that will vary by type of employment. In particular, since quarantined employees are not ill, the decision to count the quarantine period as paid “sick days” depends on the generosity of the employer. Workers without benefits will also likely face financial hardship, and therefore if quarantine is implemented, consideration should be given to financial support mechanisms (Rothstein & Talbott, 2007). Third, restrictive measures to enforce quarantine risk driving cases underground and can be counterproductive (as when reports emerged of people fleeing Beijing upon hearing of potential quarantine orders related to SARS) (Letts, 2006). Despite these concerns, public support for quarantine measures remains high, particularly when it is a voluntary measure rather than a legally imposed one (Blendon et al., 2006; Lau, Kim, Tsui, & Griffiths, 2007).

In general, the issue of balancing individual rights and community well-being can best be addressed through the following four principles:

1. There should be clear evidence of benefit of quarantine as a control measure for the illness and evidence of the necessity of quarantine to contain it;
2. The least restrictive feasible means of enforcement should be used;
3. Support services should be offered to those in quarantine; and
4. Authorities must clearly communicate the reasons for their actions and put in place an appeal mechanism (Cetron and Landwirth, 2005).

Several of these conditions cannot be met for influenza once transmission is sustained in a community, in particular the feasibility of being able to identify individuals before their infectious period; as a result, quarantine is unlikely to contain transmission.

#### Pandemic H1N1 Recommendations

- It is not recommended that asymptomatic exposed individuals be quarantined. Early isolation if exposed individuals become ill should be the focus.

#### **Self-Monitoring of Symptoms and Reporting of Illness**

##### Evidence and Considerations

During a pandemic, laboratory testing resources are likely to be quickly overwhelmed, leaving most individuals to be diagnosed based on symptoms. Since influenza surveillance relies in part on laboratory testing, this situation raises the question whether an alternative method, such as reporting to a central authority, should be encouraged in order to (1) estimate the number of cases in the community; and (2) identify those individuals in need of follow-up. With respect to the first point, it is unlikely that, given the patient-initiated nature of self-reporting, this plan would result in better data than that collected through other means such as sentinel physician networks.

The second point requires exploration of the type of follow-up envisioned. Monitoring compliance with public health interventions (with consequences for non-compliers) has been indicated to decrease public support for the interventions (Blendon et al., 2006) and is therefore not recommended. Follow-up for the purposes of ensuring medical care for those individuals who require it would need a significant investment of resources; thus, a more practical method is a communications plan emphasizing the signs and symptoms that should prompt an individual to present themselves for additional care.

#### Pandemic H1N1 Recommendations

- While it is appropriate for people to be aware of their health and seek early assessment and self-isolate if they do develop fever and cough, it is not generally recommended that they report to any public health authority in this regard. Exceptions to this may be advised for early detection of influenza in remote communities.

#### **Advise Contacts to Defer Travel to Unaffected Areas**

##### Evidence and Considerations

As detailed in the public health measures document on measures for persons travelling within the country, >99 percent of travel between regions must be halted in order to appreciably delay the spread of influenza between districts (Cooper, Pitman, Edmunds, & Gay, 2006; Ferguson et al., 2006; Hollingsworth, Ferguson, & Anderson, 2006; Colizza, Barrat, Barthelemy, Valleron, & Vespignani, 2007; Ciofi degli Atti et al., 2008). As a result, advising contacts of influenza cases to defer travel is unlikely to prevent the arrival of the virus in new locations. Contacts may, however, wish to delay travel for their own comfort and safety. Regions in which cases have not yet been detected may not have an adequate medical response to handle complications and may

impose restrictive quarantines and other measures on such travellers despite limited evidence of effectiveness.

#### Pandemic H1N1 Recommendations

- It is not recommended that contacts defer travel to unaffected areas for public health reasons, though personal reasons may lead to such a decision for some people.

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## Annex C: Measures to Increase Social Distance

### Introduction

This document discusses why measures to increase social distance should be considered as part of pandemic planning, and identifies the range of measures for which consideration and planning are needed.

### Closure of Schools

#### Evidence and Considerations

Any consideration of closing schools must take into account the extensive social and economic consequences of such an action. Schools are important to the interpersonal as well as academic development of children; they can also be sites where additional services such as breakfast programs or counselling take place. Furthermore, it is the most vulnerable children—those living in poverty, those whose first language is not English, and those struggling academically—who stand to bear the greatest burden of school closures, potentially placing them at an additional disadvantage when they are reopened (American Academy of Pediatrics & Trust for America's Health, 2007; Berkman, 2008). In addition, there are consequences for parents: they must either arrange alternative child care, possibly at some expense, or take time away from work to care for their children (Sadique, Adams, & Edmunds, 2008). One study did find that most parents were able to arrange free child care when the school was shut for an outbreak; the authors attributed this result to parents' experience arranging care for snow days (Johnson et al., 2008).

Against these considerations is balanced the potential benefits of school closures in reducing the transmission of influenza. For benefits to be accrued from this action, two conditions must be met: (1) a significant proportion of transmission events must occur in schools; and

(2) the transmission events that would occur in school are not transferred to alternative venues (such as child care facilities, playgrounds or shopping malls). While it is logical to conclude that much influenza transmission occurs in schools, given that children shed large amounts of virus and have varying abilities to perform hygienic behaviours, few studies have investigated their social contacts (Mikolajczyk, Akmatov, Rastin, & Kretzschmar, 2008) or the effects of eliminating school-based contacts on the transmission of influenza (Heymann, Chodick, Reichman, Kokia, & Laufer, 2004; Aledort, Lurie, Wasserman, & Bozzette, 2007). Modelling, however, suggests that school closures could be useful in decreasing the peak (Ferguson et al., 2006; Germann, Kadau, Longini, & Macken, 2006) and overall attack rates (Glass, Glass, Beyeler, & Min, 2006; Glass & Barnes, 2007; Haber et al., 2007; Cauchemez et al., 2008; Vynnycky & Edmunds, 2008). Substantial benefit from school closures will likely only be accrued if it is done very early in the pandemic (i.e., below 10 percent attack rate in the general population [Glass & Barnes, 2007; Haber et al., 2007; Halloran et al., 2008] or after 10 cases have been identified in the school [Glass et al., 2006]), the schools remain closed for an extended period of time (e.g., until there have been zero cases among students for seven days [Davey & Glass, 2008]), and the closures are combined with other measures such as home isolation or antiviral prophylaxis (Roberts, Baker, Jennings, Sertsov, & Wilson, 2007). Although teenagers have more assortive mixing (i.e., contacts with many different age groups) than younger children (Glass & Glass, 2008), better outcomes would likely be achieved by targeting younger children only with school closures, as they may be more likely to spread the virus (Chen & Liao., 2008) and less likely to meet at alternate venues, thereby undoing any benefits of school closures (Glass et al., 2006).

The proportion of transmission that occurs in schools will depend on the pandemic profile, as a strain of influenza that disproportionately affects children can be expected to spread more rapidly in a school setting than one where the burden of illness is primarily in adults; this may be another factor influencing the decision to close schools (Glass & Barnes, 2007).

Closure of daycares and universities/colleges may be considered along with district-wide school closures. While some modelling studies support daycare closures (Halloran et al., 2008; Vynnycky & Edmunds, 2008), this action would have marked social and economic consequences, as many daycares are home businesses for the providers, and children attending daycare, unlike some older schoolchildren, cannot be left unsupervised. For universities, even if classes and events are cancelled, most schools cannot close completely, as there are essential operations (such as care of laboratory animals) that must continue and often a great number of students living in residences (Beaton et al., 2007).

Daycares, primary schools, high schools, colleges and universities each need to be considered separately based on the emerging epidemiology. Universities, except for dormitories, could be considered equivalent to a workplace setting, as could high schools and colleges. Daycare and elementary school might present with a differing degree of transmission due to behavioural differences in younger age groups.

#### Pandemic H1N1 Recommendations

- Widespread proactive school closures are not recommended given the balance of virulence in a particular age group and the social and economic impact of closures. Proactive school closures should only be considered if there is increased virulence in the school-aged population and mitigation programs could be implemented to overcome the economic and social

consequences. This consideration should be taken in the context of widespread community and workplace closures as a method to blunt transmission until a vaccine is available.

- It is not recommended that schools be reactively closed based on any particular number of cases among students or staff. While it is recognized that, if implemented, early closures are likely to be more effective than later closures, it is also important to consider the potential impact of closures in terms of shifting the locus of transmission to other community sites.
- It is recommended that voluntary withdrawal (self-isolation) of symptomatic individuals from schools occur just as with any other symptomatic individuals.

#### **Population-Wide Measures to Reduce Mixing of Adults**

##### Evidence and Considerations

For many adults, particularly those without children, the principal site of exposure to the influenza virus will be their place of employment. As a result, workplace measures to reduce influenza transmission between employees will be an important mechanism for limiting the spread of the disease. Many of the measures recommended are identical to those recommended for the general population: hand hygiene, respiratory etiquette and voluntary home isolation of symptomatic individuals (Weisfuse et al., 2006). Additional measures such as separating workstations as much as possible or staggering arrival times may be considered by individual companies as part of their pandemic planning process; however, these measures, while reasonable, are not yet supported by an evidence base (Fabian, 2006; Halloran et al., 2008).

Closure of workplaces has been modelled to show some impact in reducing the peak and cumulative attack rates, especially when combined with school closures (Carrat et al.,

2006; Ferguson et al., 2006). Achieving closure rates high enough to be effective, however, is likely to have severe economic consequences, particularly for small businesses and for workers without adequate supports or savings.

Telecommuting may be a viable alternative to workplace closures, although it is dependent on the nature of the work and the extent of the infrastructure (computers, Internet connections, secure portals) available to support it (Fabian, 2006; Whitley et al., 2006; Dalton, Durrheim, & Conroy, 2008; Watkins et al., 2008).

An essential element of pandemic planning for any workplace is ensuring that workers who are ill have adequate financial supports, thus minimizing the likelihood that they will attend work out of necessity. Businesses should be encouraged, during their pandemic planning processes, to investigate the supports available, especially for people who are ill or who are providing care to ill people but who normally would not qualify for sick leave (Skelton, 2006). Any such plan should be developed with the input of workers in order to create a sense of buy-in and therefore improve compliance with any measures recommended (Dalton, 2006).

Bans on community events and mass gatherings were common during the 1918 pandemic, but evidence of their impact on morbidity and mortality is lacking: a sole study found that an association between early bans on public gatherings was present or absent depending on the test used, and noted that the effects of such interventions were extremely difficult to separate from those of the other measures introduced concurrently (Hatchett, Mecher, & Lipsitch, 2007). Experts are divided on the utility of bans (Aledort et al., 2007). Given this uncertainty, and given the social disruption that would come with prohibiting attendance at religious events and family events, care must be taken only to consider restricting public gatherings based on clear evidence of transmission in specific situations. Despite the lack of evidence, telephone surveys have shown that many people perceive a high risk of

infection in public places such as entertainment venues and public transportation, and would therefore avoid such places spontaneously during a pandemic (Blendon et al., 2006; Sadique et al., 2007).

#### Pandemic H1N1 Recommendations

- It is not recommended that workplaces be closed. Focus should be on self-isolation of ill workers, ill workers staying home, hand hygiene and cough etiquette in the workplace and enhanced environmental cleaning.
- It is not recommended that mass gatherings be cancelled. While there appears to be broad public acceptance of the need to personally avoid mass gatherings, there is scant evidence to suggest that cancelling such gatherings brings additional benefit. It is suggested, though, that organizers of such gatherings continue to reiterate appropriate public messaging regarding hand hygiene, cough etiquette, ill people staying home and basic social distancing concepts.



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## **Annex D: Measures to Decrease Interval Between Symptom Onset and Patient Isolation**

### **Introduction**

This document discusses why measures to decrease the interval between symptom onset and patient isolation should be considered as part of pandemic planning, and identifies the range of measures for which consideration and planning are needed.

### **Public Campaign to Encourage Prompt Self-Diagnosis**

#### Evidence and Considerations

Isolation of symptomatic individuals will undoubtedly be carried out with higher compliance than quarantine of healthy contacts, given the greater sense of urgency that accompanies the development of symptoms for most people. For this reason alone, prompt self-diagnosis can be expected to decrease transmission in the community. As well, many people will be exposed to infectious individuals without their knowledge, and will therefore not be aware of the need to enter quarantine; for these people, prompt self-diagnosis will reduce the period in which they are transmitting the virus in the community. Encouraging self-diagnosis also can be expected to lessen the burden on health care facilities and minimize nosocomial transmission.

#### Pandemic H1N1 Recommendations

- It is recommended that educational campaigns not only stress the importance of hand hygiene and cough etiquette but also the need for prompt self-diagnosis. Case definition, warning signs to watch for, directions regarding further assessment and treatment, self-care, follow-up, and how to obtain more information are aspects that need to be covered in messaging.

### **Screening for Fever**

#### Evidence and Considerations

As fever is a common symptom of influenza, the suggestion has sometimes been made to use its presence or absence as an initial screening test for influenza. There are several problems with this approach. First, it is impractical to screen the entire population as frequently as would be required to remove cases before they can infect others; many households will lack thermometers or the expertise to use them properly, and, at least in regards to SARS, thermal scanning equipment was shown to be ineffective (Pang et al., 2003). Second, fever is only present in 35 percent of seasonal influenza cases (low sensitivity) (Carrat et al., 2008) and can be caused by a myriad of other respiratory illnesses and other conditions (low specificity) (Heymann, 2004). In general, specificity can be improved by raising the pre-test likelihood of a positive result; in this situation, this means encouraging individuals to check for fever only in the presence of another influenza symptom or subjective feeling of fever.

#### Pandemic H1N1 Recommendations

- It is not recommended that individuals take their own temperature in the absence of a subjective feeling of fever or other influenza symptom, but prompt self-diagnosis is encouraged if symptoms are noted.
- It is not recommended that thermal scanning be established in public settings.

### **Set up Fever Telephone Hotlines with Ambulance Response**

#### Evidence and Considerations

Telephone hotlines staffed by registered nurses have been shown to decrease physician and emergency room visits by callers in a non-pandemic situation (O'Connell, Johnson, Stallmeyer, & Cokington, 2001). It is anticipated

that similar benefits may be achieved using the HealthLink BC 811 phone line to provide information about self-diagnosis and self-treatment during an influenza pandemic. In addition to reducing nosocomial transmission, disseminating such information via the HealthLink BC 811 will hopefully decrease the period between symptom onset and patient self-isolation. The HealthLink BC 811 is not equipped to handle medical emergencies, but will connect callers with emergency services if necessary.

#### Pandemic H1N1 Recommendations

- It is recommended that telephone hotlines staffed by registered nurses be employed to assist callers in self-diagnosis and self-management.
- It is not recommended that such telephone hotlines serve to dispatch ambulances to those with influenza.

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## Annex E: Disinfection Measures

### Introduction

This document discusses why disinfection measures should be considered as part of pandemic planning, and identifies the range of measures for which consideration and planning are needed.

### Hand Hygiene

#### Evidence and Considerations

The utility of hand hygiene as a means of preventing the transmission of influenza depends on the proportion of infection that occurs through self-inoculation with hands that have come into contact with infected surfaces, as compared to infection through the droplet route. Hands can become contaminated through direct (such as hand-to-hand) contact with an infectious individual or through indirect means (contact with fomites) (Brankston et al., 2007). Surprisingly few studies have been conducted on the effectiveness of hand cleaning in the community, perhaps due to near-universal acceptance of the utility of the measure. One study found no change in secondary attack rate between controls and households given hand sanitizer subsequent to a doctor's visit for influenza; however, this study was underpowered and adherence was <25 percent (Cowling et al., 2008). One well-designed randomized controlled trial in Pakistan found children were half as likely to contract pneumonia if they lived in a household receiving soap and hand washing instruction as children in control households (Luby et al., 2005). A Cochrane review of methods for preventing respiratory virus infections additionally suggests that promotion of hand washing is most effective at preventing transmission from young children, perhaps because they are the least likely to regularly practice hygienic behaviour, have longer-lived infections and have extensive social contacts (Jefferson et al., 2009).

Both hand washing and the use of alcohol-based hand rubs are effective at removing the influenza virus from the hands (Collignon & Carnie, 2006). The advantage of alcohol-based rubs is that they do not require water and are therefore convenient to use, which may improve compliance. The drawbacks of these products are that they are more expensive than soap and water and are not effective if the hands are visibly soiled (Collignon & Carnie, 2006), and they may be unsuitable for certain sites where they may be stolen and consumed (Leung et al., 2008). There is no evidence that antibacterial soap is more effective than plain soap and water at decreasing influenza transmission (Luby et al., 2005; Aledort, Lurie, Wasserman, & Bozzette, 2007; Jefferson et al., 2009).

#### Pandemic H1N1 Recommendations

- It is recommended that hand washing with soap and water or the use of alcohol-based hand rubs be strongly encouraged. Antibiotic soaps are not necessary. A communications strategy that emphasizes the proper use of each of these products should be adopted.

### Set up Hand Sanitizing Stations in Public Settings

#### Evidence and Considerations

Since hand hygiene is a cornerstone of the pandemic response, it may be of benefit to increase opportunities for people to clean their hands. Given the lack of public washrooms in many communities, hand sanitizing stations in public spaces may be considered as a way to encourage frequent cleaning of hands. This strategy has the advantage of not penalizing those who do not have access to their own hand rubs due to lack of funds or scarcity. There are no studies proving the effectiveness of this approach, however, and it entails

considerable organizational capacity to coordinate and maintain. Placing alcohol-based hand rubs in public places also raises the possibility that the solution will be consumed unless precautions are put in place.

#### Pandemic H1N1 Recommendations

- It is not recommended that alcohol-based hand rubs be installed in uncontrolled public settings. Private institutions and companies are encouraged to consider such measures for their own sites where hand hygiene stations can be more easily monitored and maintained.

### **Cleaning of Surfaces in Public Settings**

#### Evidence and Considerations

As the influenza virus can remain viable on non-porous surfaces for up to 24 hours (Bean et al., 1983, as cited in Buxton Bridges, Kuehnert, & Hall, 2003), public concern may prompt discussion of regularly disinfecting surfaces in settings such as public transportation or other places through which many people pass in a given day. There are, however, no studies to prove the efficacy of this approach, and considerable practical issues with carrying it out. Public health communications should focus on hand hygiene as the most effective method of preventing self-inoculation with contaminated hands.

#### Pandemic H1N1 Recommendations

- It is not recommended that there be specific cleaning measures undertaken in uncontrolled public settings. Private institutions and companies are encouraged to consider such measures for their own sites, particularly in high touch areas such as food courts, elevators and washrooms.

### **Household Disinfection of Potentially Contaminated Surfaces**

#### Evidence and Considerations

In contrast to public spaces, where the risk is low that a given surface will be contaminated with viable influenza virus, surfaces in the homes of an infected individual are reasonably likely to have viable influenza virus. This is due to both the greater certainty of an infectious individual coming in contact with the surfaces in question, as compared to public venues, and the greater intensity of contact, especially in cases of home isolation. As a result, frequent disinfection of potentially contaminated surfaces such as doorknobs, countertops, faucets and other surfaces will potentially protect other household members. Either disinfectants or detergents followed by rinsing are appropriate for cleaning contaminated household surfaces (Bloomfield, Exner, Fara, & Scott, 2008).

#### Pandemic H1N1 Recommendations

- It is recommended that frequently touched surfaces in the homes of infected individuals be disinfected 2-3 times per day. Such surfaces include doorknobs, countertops, telephones and faucets, among others. Routine household cleaners are effective against influenza, including pandemic H1N1 influenza.

### **Air Disinfection**

#### Evidence and Considerations

Ultraviolet (UV) inactivation of the influenza virus is technically possible if the virus is aerosolized (as opposed to suspended in large droplets) using UV-C radiation (Brickner et al., Weiss et al., 2007). A cross-over trial of UV disinfection of air in an office building did find a reduction in self-reported respiratory symptoms, though not specific to influenza (Menzies et al., 2003).

### Pandemic H1N1 Recommendations

- It is not currently recommended that air disinfection approaches be taken, given insufficient evidence of effectiveness.



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## Annex F: Measures for Persons Travelling Within the Country

### Introduction

This document discusses why measures for persons travelling within the country should be considered as part of pandemic planning, and identifies the range of measures for which consideration and planning are needed.

### Avoid Contact with High-Risk Environments

#### Evidence and Considerations

Depending on the pandemic profile, the virus might be circulating solely in humans or in humans and commercially important species such as swine and poultry. In a situation where the virus is circulating heavily in swine or poultry, it may be advisable for susceptible individuals, particularly those at high risk of complications, to minimize their contact with such animals. However, where the influenza virus is circulating heavily in humans but not animals, contact should follow procedures designed to minimize the animals' exposure to the virus, including refraining from visiting farms while symptomatic (see the Canadian Food Inspection Agency guidelines for more details of procedures to protect animal health).

#### Pandemic H1N1 Recommendations

- It is recommended that the public limit visits to swine and poultry farms, and that symptomatic individuals be restricted from visiting/working in swine/poultry farms. There should be adherence to current Canadian Food Inspection Agency recommendations.
- It is recommended that advice be provided to people with underlying health conditions that put them at high risk of severe disease or complications from influenza to consider avoiding uncontrolled situations like crowds where they may have a higher risk of exposure to influenza when the pandemic strain is circulating in their community.

### Recommend Deferral of Non-Essential Travel to Affected Areas

#### Evidence and Considerations

Given the spread of influenza and often focal outbreaks, as well as the differing control measures that will be enacted in differing jurisdictions, the timing of the pandemic peak will vary across locales. Persons at high risk for severe disease or complications from influenza may consider deferral of travel to areas of high influenza activity for personal reasons, including access to their usual care providers, etc. There is no evidence to support recommendations for deferral of travel for most people as some level of transmission is found in all communities.

#### Pandemic H1N1 Recommendations

- It is not recommended that travel advisories be issued. Such advisories are usually intended to protect individuals, not communities, and given the already prevalent nature of pandemic H1N1 in B.C., such advice is unlikely to confer any benefit. Persons at risk may consider deferral of travel for personal reasons.

### Cordon Sanitaire/Travel Restrictions

#### Evidence and Considerations

With the frequency and pace of global travel in today's society, it is no longer possible to impose travel restrictions to prevent influenza from spreading to a given geographical region. Although some remote island communities have in the past documented successes controlling disease using travel restrictions,<sup>1</sup> and data from the months following the post-September 11 flight ban show some delay in seasonal influenza transmission (Brownstein,

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<sup>1</sup> For example, the Ionian Islands in 17th/18th centuries (Konstantinidou et al., 2009) and the South Pacific during the 1918 pandemic (McLeod et al., 2008).

Wolfe, & Mandl, 2006), contemporary models of air and land travel show that more the 99 percent of travel into a region would need to be halted to appreciably delay the first wave of the local epidemic (Cooper, Pitman, Edmunds, & Gay, 2006; Ferguson et al., 2006; Hollingsworth, Ferguson, & Anderson, 2006; Colizza, Barrat, Barthelemy, Valleron, & Vespignani, 2007; Ciofi degli Atti et al., 2008). Such reductions are not economically feasible or practical (Germann, Kadau, Longini, & Macken, 2006; Crepey & Barthelemy, 2007). Travel restrictions may be slightly more useful at delaying or minimizing the influenza peak in rural and remote communities (Sattenspiel & Herring, 2004; Markel et al., 2006; McSweeney et al., 2007), but the benefit of the severe restrictions necessary should be balanced against the disadvantages for the community in other areas (such as routine health care), with forward positioning of antivirals and other supplies perhaps a more feasible alternative.

During the SARS outbreak, many jurisdictions instituted screening systems at airports to identify those travellers with fevers. As with general travel restrictions, screening and subsequent isolation of symptomatic individuals is only effective if the vast majority of infectious individuals are prevented from entering, otherwise seeding and in-country spread will quickly replace imported cases as the major source of infection (Pitman, Cooper, Trotter, Gay, & Edmunds, 2005). Modelling and expert opinion suggests that it is not feasible to expect sufficiently high detection rates and that screening will detect and inconvenience a great number of people with fever-producing conditions other than influenza (Pitman et al., 2005; Aledort, Lurie, Wasserman, & Bozzette, 2007).

#### Pandemic H1N1 Recommendations

- It is not recommended that travel restrictions be implemented in British Columbia. The purpose of travel restrictions is usually to prevent the importation of

disease. In the case of pandemic H1N1, the time for potential benefit has already passed.

#### **Disinfect Clothing, Shoes and Other Objects of Persons Exiting Affected Areas**

##### Evidence and Considerations

Anecdotally, during the SARS outbreak, authorities in several Asian cities carried out disinfection of shoes, clothing and other objects of healthy and ill individuals in order to reduce the risk of SARS transmission. While there may be a theoretical risk of transmission from such objects, the practical risk is minimal in the community setting and such measures are therefore not recommended. Two exceptions to this guideline exist. First, it is prudent to regularly wash bed linens (and any other objects that may have come into contact with respiratory secretions) of patients in home isolation, as this will reduce the risk of infecting other members of their households. As well, Canadian Food Inspection Agency guidelines may require disinfection procedures when entering or leaving certain facilities containing livestock, in order to protect the health of the animals.

##### Pandemic H1N1 Recommendations

- It is not recommended that a general disinfection of clothing or footwear or vehicles take place. Routine washing of clothing and linens is sufficient for individuals ill from pandemic H1N1 influenza. Specific situations such as may be faced by farmers are addressed in Canadian Food Inspection Agency guidelines.

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