

Reducing transmission of pandemic (H1N1) 2009 in school settings

A framework for national
and local planning and response

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■ Introduction

Experience with pandemic (H1N1) 2009 in many countries has demonstrated the importance in some communities of schools in amplifying transmission of the pandemic virus – both within schools and the wider community.¹ Transmission of epidemic seasonal influenza in school settings is well documented and can be explosive and fast moving, affecting a sizeable proportion of students and staff.

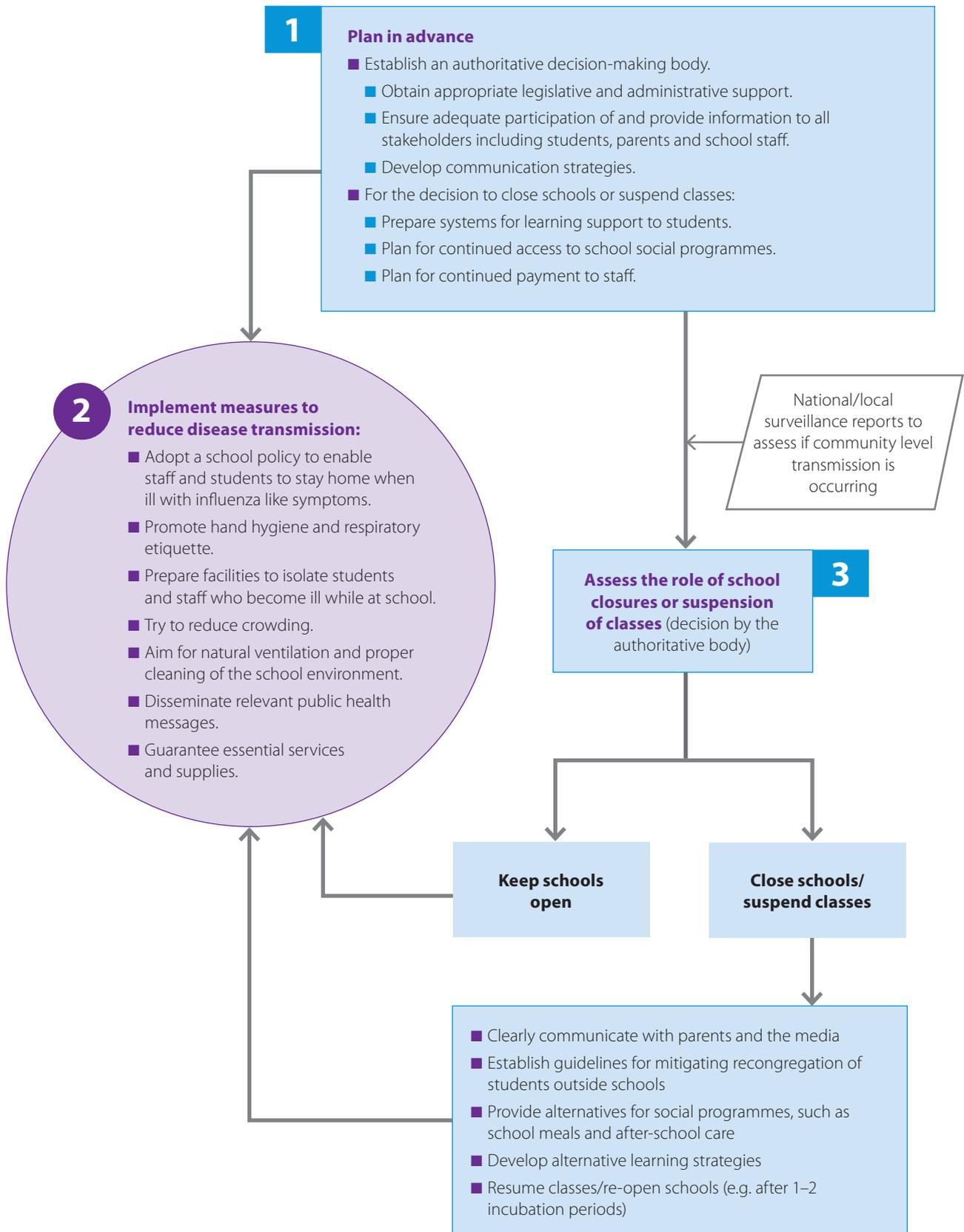
Infection within schools is of considerable concern to parents as well as decision makers. A variety of options for reducing infection within schools are available and discussed in this document. This document outlines a framework for national and local health and school authorities to consider when developing pandemic planning and decision-making guidance to reduce school-associated pandemic (H1N1) 2009 infections. The framework is applicable to all levels of education ranging from primary to secondary school levels. It is not applicable to infant or other child-care settings or boarding/dormitory settings. Many of the measures herein are generally advised for all settings such as hand hygiene and respiratory etiquette.

The components of the framework for reducing transmission of pandemic (H1N1) 2009 in school settings include the following 3 areas (see **Figure 1**).

1. Planning in advance
2. Implementing measures to reduce transmission:
 - a. Use of hand hygiene and respiratory etiquette
 - b. Staying away from school when ill
 - c. Isolating students and staff who become ill while at school
 - d. Reducing crowding
 - e. Proper cleaning and ventilation
 - f. Disseminating relevant public health messages
 - g. Guaranteeing essential services and supplies
3. Assessing the role of class suspension and/or school closure.

¹ <http://www.who.int/wer/2009/wer8434.pdf>

FIGURE 1. REDUCING TRANSMISSION OF PANDEMIC INFLUENZA IN SCHOOLS



■ Framework for measures to reduce transmission

1. Planning in advance

Reducing transmission of pandemic (H1N1) 2009 influenza in school settings requires the engagement and commitment of school community members (e.g. principals, teachers, students, school staff and parents) and public health authorities at local and national levels. Information and lessons identified from countries' initial experiences with pandemic H1N1 can be helpful in revising earlier plans.

Effective lines of communication and education between students, parents and staff are essential. All need information about the risks and consequences of pandemic influenza and how application of measures described in this framework can help to reduce infection in schools.

Planning should include measures to mitigate the secondary impacts of school closures² or class suspensions³ on the community. For example:

- Promoting coordination among adjacent school districts to maintain trust and avoid fear among the public
- Minimizing disruption of education through alternative strategies
- Continuing access to school-based social programmes, such as meal distribution
- Continuing payment to staff in the educational system
- Encouraging flexible working conditions when the dependants of workers are ill
- Maintaining essential services if workers have to stay home to care for dependants.

2. Implementing measures to reduce transmission

a. Staying away from school when ill

WHO has previously advised that persons who feel unwell (i.e. have a high fever, cough or sore throat) should stay at home and keep away from work, school or crowds until symptoms resolve.^{4,5} **This is one of the most important measures to reduce transmission of pandemic influenza in school settings and applies to students, teachers and other staff.** Active screening or monitoring of students and staff for influenza illness is not necessarily needed. However, the success of this measure is linked to parents, teachers and other staff having adequate knowledge of the signs and symptoms of pandemic influenza.

Ill persons and their caregivers should be aware of basic homecare measures, as well as the warning signs for severe influenza, and when to seek medical care.^{4,6} WHO has published guidance on treatment with antivirals.⁷

² During school closure both administrative staff and students stay home.

³ During class suspension selected administrative staff work at the school but students stay home.

⁴ http://www.who.int/csr/disease/swineflu/frequently_asked_questions/what/en/index.html

⁵ http://www.who.int/csr/resources/publications/swineflu/framework_20090626_en.pdf

⁶ http://www.who.int/csr/resources/publications/swineflu/PI_summary_low_resource_02_05_2009.pdf

⁷ http://www.who.int/csr/resources/publications/swineflu/h1n1_use_antivirals_20090820/en/index.html

b. Promoting hand hygiene and respiratory etiquette

Promoting correct and consistent hand hygiene⁸ and respiratory etiquette^{4,6} in school settings requires information and training that must reach a range of age groups and varying reading and educational levels. In addition, supplies to facilitate good hand hygiene and respiratory etiquette (e.g. tissues, waste bins, soap and water, alcohol hand rubs) must be available.

c. Isolating students and staff who become ill while at school

During a pandemic, schools should plan for the likelihood of persons becoming ill with fever and other typical symptoms of influenza during school hours. Ill students and staff should be moved as quickly as possible to a separate room and provided with a medical mask while arrangements are made for them to return home or seek medical care. The room should be equipped with the necessary supplies to facilitate hand hygiene and respiratory etiquette. In addition, school staff attending ill persons can wear a mask, then dispose of it immediately after contact and cleanse hands thoroughly afterwards.⁹

d. Proper cleaning and ventilation

Surfaces or objects that are shared by students and staff should be cleaned regularly with soap and water or routine household cleaning products or disinfectants. To improve natural ventilation in classes and other areas, keep windows open when possible to improve air flow; this is especially important in rooms where ill persons are being isolated.

e. Reducing crowding

In general, WHO advises persons to reduce the time spent in crowded settings, if possible. Implementing this in a school setting poses special challenges. However, if pandemic influenza is circulating in the wider community, schools may wish to consider minimizing situations in which large numbers of students are gathered in a confined space (e.g. assembly hall or eating area), especially if the space is poorly ventilated. It may be possible to organize more frequent gatherings (e.g. increase the number of communal lunch periods) comprised of fewer individuals.

f. Disseminating relevant public health messages

Reducing fear and panic and empowering students, parents and staff to make informed decisions heavily depend on providing adequate, timely and clear messages which are updated and reinforced regularly. Schools should collaborate with national/local health authorities and follow their guidance on which key messages to deliver and try to ensure the messages reach and are acceptable to the target audiences.

g. Guaranteeing essential services and supplies

Even in a moderate pandemic, some essential services may be interrupted mainly due to absenteeism of staff. Schools should make their own business continuity plans and align them to those of their essential suppliers and other stakeholders.

⁸ http://www.who.int/csr/resources/publications/swineflu/AH1N1_clean_hands/en/index.html

⁹ <http://www.who.int/csr/resources/publications/Adviceusemaskscommunityrevised.pdf>

3. Assessing the role of class suspension and/or school closure

The decision to suspend classes or close schools may be made at the national or local levels; WHO cannot provide a specific recommendation for or against school closures. However, WHO can assist countries in their decision making by:

- Outlining necessary advance preparation
- Reviewing the evidence and experience of countries to date
- Presenting the key issues for consideration

Advance preparation

In addition to the measures noted previously, planning for class suspensions or school closures must take into account the appropriate legal authority and processes. Decisions should be consistent and well-documented. Care must be taken to avoid discrimination based on nationality, ethnic origin, religion, gender, disability and any other relevant factors.

Evidence and experience to date

National and/or local authorities in many countries in the northern and southern hemispheres closed schools for varying periods of time in response to the introduction and subsequent spread of pandemic (H1N1) influenza. WHO's informal mathematical modeling network has summarized available information regarding the effectiveness of school closures in reducing transmission of pandemic (H1N1) influenza.^{1,10} In brief, their findings include:

- Limited data suggest that closing kindergartens and primary schools may have had an effect in reducing transmission in some communities.
- The economic costs of school closures might be significant if parents of schoolchildren need to stay home for caretaking.^{11,12}
- “Substantial” reductions in peak attack rates (and thus reductions in demands on health care systems during peak periods) might be achieved with relatively short periods of school closure.
- Transmission in schools and among contacts of school children and staff is very likely to resume once schools re-open unless widespread immunity is achieved by contracting disease or being vaccinated.

In anticipation of the upcoming northern hemisphere influenza season and the resumption of schools following the summer break, several countries have developed or revised guidance for schools including primary, secondary and post secondary settings. In general, the United States, Canada, and the European Union have not adopted widespread proactive¹³ school closures. However, these guidances acknowledge that local authorities are best positioned to make decisions about reactive school closures.¹⁴

¹⁰ http://www.who.int/csr/disease/swineflu/notes/h1n1_school_measures_20090911/en/print.html

¹¹ Sadique MZ, Adams EJ, Edmunds WJ. Estimating the costs of school closure for mitigating an influenza pandemic. *BMC Public Health* 2008; 8:135.

¹² Sander B et al. Economic evaluation of influenza pandemic mitigation strategies in the United States using a stochastic microsimulation transmission model. *Value in Health* 2009; 12:226–33.

¹³ Proactive school closure: closure of a school (or suspension of classes) before substantial transmission among students occurs.

¹⁴ Reactive school closures: closure of a school (or suspension of classes) when many students and/or staff are ill or absent.

Issues for consideration

Decisions regarding class suspensions and school closure need to take into account and balance a complex array of considerations.¹⁰

- Severity of clinical illness associated with infection with the pandemic virus: communities might be more willing to take a decision to implement school closures or class suspensions if the pandemic is causing more serious disease.
- Timing of implementation: to achieve maximum reductions in attack rates, suspensions/closures must be implemented early in a pandemic outbreak; if implemented late, they would not be expected to reduce transmission. However, as with seasonal influenza, school closures may occur if high levels of absenteeism among students and/or staff make it impractical to continue classes. There are no agreed triggers to implement school closures; some that have been proposed include the first case in a student or staff member, the initial outbreak in a school, cases or outbreaks in schools that are nearby or cases or outbreaks in schools that students have had contact through shared academic, sports or other social interactions.¹⁵
- Likelihood that it will be possible to keep students from having contact with other students: if students congregate in a setting other than a school, they can spread the virus and negate the intended effect of school closures.
- Special characteristics of the school population: for instance, specialized schools with many students at increased risk for complications of influenza due to underlying medical conditions may more readily implement schools closures/suspension of classes.
- Duration of time that the school is closed: this may reflect epidemiological considerations such as a return to low levels of transmission in the community, the likelihood that immunity can be achieved through immunization against the pandemic strain and practical considerations related to impacts and secondary consequences.¹⁵ Based on countries' experiences, schools might consider closing or suspending classes for 1–2 incubation periods.

Impacts and secondary consequences

Although school closures and class suspensions may reduce peak attack rates of pandemic influenza in the community, they can have significant impacts and secondary consequences.^{10,11,15} These are briefly summarized as follows.

- Work absenteeism related to the need to care for children at home could have a significant economic impact both on a country's gross domestic product and on an individual family's income through loss of pay and/or jobs.
- Healthcare and other essential services could be further under-staffed if nurses, physicians and other key workers stayed at home to care for their children.
- Children's health and well-being could be at risk if highly beneficial school-based social programmes (e.g. school meal programmes) were not available or if young children were left at home unsupervised.
- Students' educational advancement could be jeopardized if they missed key exams or long periods of class work without any alternative learning strategies.
- Media reporting of school closures could increase pandemic-related fears and concerns in the local community.

¹⁵ Cauchemez S et al. Closure of schools during an influenza pandemic. *Lancet Infectious Diseases* 2009; 9:473–81.

■ Summary

National and local authorities have several options for reducing pandemic influenza infection within schools (**Figure 1, Box 2**). Advance planning is strongly recommended, especially if school closures or suspension of classes (**Figure 1, Boxes 1, 3**) are under consideration.

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