Mitigating the impact of the new influenza A(H1N1): options for public health measures

(WHO Regional Office for the Western Pacific interim guidance document, 10 June 2009)

Introduction

This interim document is part of a series of guidance documents that are being produced by the Western Pacific Regional Office of the World Health Organization (WHO) in response to the public health emergency of international concern related to the new influenza A(H1N1) declared on 25 April 2009. It was developed based on the need in the Region for further guidance on rational public health actions in response to the evolving influenza A(H1N1).

The primary target audience includes policy- or decision-makers, particularly relevant national public health authorities and other stakeholders involved in deciding and implementing individual, household and societal measures with focus on non-pharmaceutical inventions within a country. This document does not address international border issues. Public health measures related to international borders and travel are described in a separate option paper. Health education and promotion to achieve prioritized behaviour goals, also known as behaviour intervention or communication for behavioural impact, are also addressed in separate guidance documents.

This option paper elaborates further on the individual, household and societal measures listed in the document, Pandemic Influenza Preparedness and Response,¹ and should be used in conjunction with general advice for pandemic phase 5 or 6 at the global level. In addition, other exiting WHO guidelines on pandemic response may be relevant and can be used as they fit.²⁻⁴ This interim document will be updated as significant new information becomes available.

Purpose

Public health measures for influenza have two major components: (1) pharmaceutical interventions that include vaccination and the use of antiviral drugs; and (2) non-pharmaceutical interventions that include the implementation of individual, household and societal measures.

The objectives of applying or implementing public health measures are: (1) to slow the spread and shift the epidemic curve to the right in order to buy time for preparation and implementation of other measures such as vaccination; (2) to reduce the epidemic peak; and (3) to help reduce morbidity and mortality in the community by reducing the total number of cases and deaths (Figure 1).
The purpose of this document is to provide various options ("menu") of public health measures and discuss the benefits and limitations of each option. Unlike other WHO guidelines, in general, no explicit recommendations or "official positions" are made to all countries. Decisions about what option(s) or combination of public health measures should be applied in a country must be made on the basis of national and local situations. Nevertheless, this document highlights key considerations and general guidance that assist the national decision-making process.

**Key considerations**

Health authorities should be clear about the public health objective in implementing various public health measures. Some measures, especially societal measures, may be costly, resource intensive and disruptive to normal social functioning.

The potential benefits of public health measures should be carefully balanced against their potentially significant social and economic costs. Key considerations or principles when deciding what interventions should be implemented at a particular time include the following:
• Public health measures should be **commensurate with the threat** that the disease poses to the country, especially the severity and its potential impact. The focus of public health measures may differ at different epidemic stages. Annex 1 suggests a framework for risk assessment and decision-making.

• Public health measures should be **evidence-based whenever possible**. Where no or little evidence exists, a mechanism to assess the effectiveness of such interventions or review new evidence when it becomes available is recommended.

• Countries should **balance** the benefits of public health measures against the costs and potential consequences. Individual countries should manage the direct and indirect costs and resources required for public health measures; the consequences on critical infrastructure, health care delivery and society; and the feasibility and sustainability of measures.

• Public health measures, especially societal measures, should suit the **country or local context** (such as the national and local epidemiological, social-cultural and legal conditions). Decision-making should be based on the assessed situation. Some **flexibility** in modifying public health measures based on the evolving situation is critical. A national command-and-control system or national advisory committee may be established or utilized to allow rapid tailoring or even changing of strategies for interventions.

• **Preparation, coordination and communication** are vital for the successful implementation of public health interventions.

## Summary of public health measures

This interim guidance document focuses on non-pharmaceutical public health measures, of which a wide range exists. Decisions on which measures to implement and at which stage of the epidemic should be based on the assessed public health risk of the outbreak and potential impact of the intervention. The decisions should be revisited based upon ongoing assessments.

This document summarizes two groups of these measures, with focus on individual/household and societal measures.
1. Individual/household measures
   - Personal protective measures (including hand and respiratory hygiene)
   - Isolation of ill persons
   - Quarantine of contacts
   - Infection prevention and control in the home setting
   - Use of masks in the community setting

2. Societal measures, including social distancing
   - Suspension of classes and child care programmes
   - Adjusting or changing work patterns
   - Restriction of public or mass gatherings
   - Domestic travel advisories and restrictions

Individual and household measures include risk communication, individual hygiene and personal protection, home care of the ill and quarantine of contacts. These measures require behavioural change in the population, multisectoral involvement, strong communication and media support. If properly implemented, these measures may lead to significant disease-control benefits across a range of settings, including the home, workplace, school, gathering places, public transportation and other community settings. These measures can also lead to significant benefits in the control of diseases other than influenza. Many factors in addition to the available scientific evidence will need to be considered before making decisions to implement certain measures. A separate guidance document on communication for behavioural impact is being developed.

Societal measures are interventions that can be applied to whole sections of society rather than individuals or families. Their primary aim is to segregate people from each other in order to prevent or slow virus transmission. Interventions should be society specific. Social distancing is a non-pharmaceutical intervention with the goal of reducing disease transmission through efforts to reduce crowding and close contact and to minimize gatherings of people. Based on historical evidence and some mathematical modelling studies, societal interventions appear to be effective in decreasing the outbreak peak in circumstances.

The decision to implement or not to implement societal interventions should be based on an assessment of the balance between the potential beneficial effects on viral transmission and the possible adverse effects on the economy and social stability.
Societal interventions, such as suspension of classes, are complex. They require careful advance planning, involving many key ministries, and a national ability to manage social consequences. Implementation of societal measures also rely on a good communication strategy to ensure public compliance.

**Issues to be addressed**

In order to optimize the use of individual, household and societal measures, to maximize the public health benefits of reducing transmission and to minimize negative consequences, a number of questions need to be answered, particularly in the planning stage. They include:

- Are there sensitive surveillance and response systems in place to produce timely data for risk assessment and decision-making for rational public health interventions? The response will be dependent on surveillance, including changing case definitions.

- Was a plan for smooth implementation prepared before the onset of community-level transmission? Planning is the key to the success of many public health interventions, including suspension of classes.

- Have the points for triggering and discontinuing societal interventions been identified? Triggers or criteria may vary from country to country and may include:
  - one or more clusters of laboratory-confirmed cases are occurring, and
  - evidence of community transmission and the severity of it.

- Is an effective communication strategy in place to improve public acceptance of and compliance with these measures?

- Is there awareness that the **timing** of implementation of public health measures (such as school closure) can influence effectiveness? "Too late" may limit public health benefits.

- Is there awareness that each public health intervention may be only partially effective in limiting transmission, and that interventions implemented in combination may be more effective in reducing transmission?

- Is there willingness to address possible disagreement and criticism as societal measures often have social and economic implications?

- Is there an appropriate monitoring and evaluation system (including effectiveness evaluations) established to inform policy development and public health actions?

- Will non-pharmaceutical interventions be implemented in combination with pharmaceutical interventions that are available, such as antiviral drugs and vaccines, during a pandemic?
Options for interventions and decision matrix

There are a number of public health measures available for countries to make balanced decisions. The biggest common challenge is the lack of data to demonstrate the effectiveness of many public health measures such as restricting mass gatherings. The knowledge base used in developing guidance for non-pharmaceutical interventions for influenza has been limited and consists primarily of historical and contemporary observations, and mathematical modelling studies, rather than controlled studies evaluating interventions. Some epidemiological modelling studies have indicated that very aggressive social distancing measures are required to achieve the objectives, as shown in Figure 1. There is also a general understanding that no single measure, including school closures, can achieve all the objectives.

Annexes 1 and 2 provide options (“menu”) for individual, household and societal public health measures. The benefits/advantages and limitations/disadvantages of each intervention have been summarized to facilitate decision-making by relevant authorities in a country. For each public health intervention option, such as suspension of classes, there may be several sub-options. Each sub-option may have different benefits and limitations. The document does not attempt to address each measure in such a level of detail.

Decisions regarding which interventions to be used, and, when, where and how to implement them should be made based on the assessed risk of the outbreak (such as likelihood of occurrence and possible impact) and the country context. Due to regional and country diversity, no single combination of public health measures will suit every country setting. Countries will need to decide on and implement their own combination (or "menu") of interventions at the different stages of disease outbreaks or epidemics based on specific country and local contexts. Meanwhile, WHO Member States are also expected to implement relevant WHO technical guidance and temporary recommendations made under the International Health Regulations (2005), when they become available.

The outbreak of the new influenza A(H1N1) infection is evolving. Based on limited data available, it appears that, although the virus has caused severe illness and deaths, most cases have been relatively "mild" (or self-limiting) in most countries at this early stage of multi-country outbreaks. Applying a combination of many aggressive public health measures may not be feasible and practical in many countries. In this regard, implementing social distancing measures for the new influenza A(H1N1), such as targeted school closures, may only help to achieve the goal of preventing an explosive outbreak in the very early stage of community-level outbreaks. One challenge that countries may face is determining how to ensure effectiveness and compliance of these public health measures when there are many mild cases and/or when the public perceives the disease as "mild" (or self-limiting).

Given the evolving situation of the new influenza A(H1N1) virus, countries should urgently prepare for the implementation of public health interventions in response to
community-level transmission and a nationwide spread of the virus, including its spread among vulnerable populations.

**Document development process and acknowledgement**

This interim option paper was developed through a collaborative process that gathered inputs from relevant specialists, experts and officers in the WHO Representative Offices in Cambodia, China, the Lao People’s Democratic Republic, South Pacific and Viet Nam, the WHO Regional Office for the Western Pacific, the Global Influenza Programme at WHO Headquarters, as well as WHO temporary advisers from Australia, Japan and Singapore. A number of technical documents related to pandemic influenza preparedness and response, public health interventions, interim advice on the new influenza A(H1N1) and research papers were reviewed. They provided the background information and basis for the development of this interim option paper.

The Communicable Disease Surveillance and Response unit in the WHO Regional Office for the Western Pacific would like to express its sincere thanks to those individual experts and officers who contributed to the development of this option paper.
Annexes

Annex 1  Suggested framework for assessment and decision
Annex 2  Individual and household public health measures
Annex 3  Societal public health measures

References


5. WHO. Recommended measures to reduce the spread of pandemic influenza – regional and factors to consider in implementation. February 2009 (draft, unpublished).


Annex 1 – Suggested framework for assessment and decision

1. Conducting a risk assessment

Risk assessments help inform decision-making regarding appropriate use of public health measures. A risk assessment process can be undertaken to address a specific context or question. Appropriate domains (such as transmissibility and severity of disease) can be used to measure the risk, depending on the scenario. Risk assessments are a dynamic process and need to be conducted based on a rapidly changing situation. Decisions for interventions based on the risk assessment approach help avoid overreaction or under-reaction.

Public health measures, especially societal measures, may be triggered by the assessed risk level. Some countries, such as the United States of America, use pandemic severity to guide the community mitigation strategy. The severity of influenza is usually measured by the number of cases of severe illness and deaths caused by the virus. However, assessment of the severity of a pandemic is complex. Severity may vary from country to country and among different population groups or geographical locales. Severity may also change as an event unfolds over time. In addition, a severity assessment largely relies on the availability and quality of information about the virus and population who are susceptible to infection.

Pandemic severity has many dimensions, including economic and social consequences. Ideally, countries will need to anticipate impacts of the virus on their population. Based on effects on human health dimensions, the impact of a pandemic on a population is a function of three determinants:

1. **Virus characteristics**: Includes virological characteristics such as inherent virulence of the virus; epidemiological features such as estimated incubation period, clinical attack rate and case fatality ratio; and clinical manifestations such as clinical course and proportion of hospitalized cases.

2. **Vulnerability of populations**: Includes pre-existing immunity, people at increased risk and nutritional status of the population.

3. **Capacity for response**: Includes availability and quality of health care services, availability of national and local resources, level of advance planning and preparedness.

The following example attempts to address the risk of an outbreak following the introduction of a novel respiratory pathogen into a community. In this scenario (as an example), risk can be measured and categorized by assessing the transmissibility and severity of the pathogen. Figure 2 shows an example of how respiratory viruses could be assessed based on these two domains and how the new influenza A(H1N1) virus compares with other respiratory viruses.
The risk category may advise possible strategies or focuses of public health interventions. For example, if a disease is highly transmissible and mainly causes mild illness at the early stage, public health interventions may focus on personal protective measures and carefully targeted social distancing measures such as school closures to prevent explosive outbreak in the early stage of community-level outbreak. Once the disease has spread widely in a country, public health interventions may need to focus on reducing transmission to high-risk groups and mitigating its impact on the vulnerable population (including improving case management of severe cases to reduce deaths).

Focuses or priorities of public health measures may differ at different stage of a pandemic. Even if an influenza pandemic was announced globally, different countries would still face different stages of outbreak or epidemic within a country. Each country should dynamically manage the changing country situation of epidemic. For example, when a country is experiencing its first imported case(s), the country may wish to make some efforts to detect possible travel-related cases through appropriate public health measures at international borders (e.g. health alerts to travellers and declaration form). However, the country should be clear about the purpose of such measures. For the new influenza A(H1N1), the current limited experience has demonstrated that border screening measures cannot prevent virus entry. Once a virus has entered a country and has caused local outbreaks (such as school outbreaks), the country may wish to shift its central focus from international borders to national and community-level responses, including possible suspensions of classes. If wide community spread is occurring, the country may need to prioritize its public health measures with the goal of mitigating its impact on voluntary populations (such as reducing deaths).

2. Decision-making based on risk assessment

Measures taken to mitigate risk should be proportional to the level of risk posed and take into account impacts on the health sector and more broadly, on society and the economy.

Risk assessments can be used to guide decision-making on the acceptability of public health measures. Health authorities often need to make well-balanced decisions. Figure 3 illustrates how the cost (including opportunity cost) and consequences of public health interventions may be matched with the level of the assessed risk. In general, it may be more socially and
economically acceptable to implement interventions with higher cost and consequences if the level of risk to the population is greater or higher (shaded area).

For example, advising respiratory hygiene is acceptable for all of these respiratory diseases and its cost and consequences are relatively low. Such measures can be considered as the common public health interventions for all respiratory illness, including the new influenza A(H1N1) infection. However, one challenge for personal protection measures is determining how to ensure high compliance when the disease appears to be relatively mild. Isolation, quarantine and social distancing measures (such as school closure, cancellation of mass gatherings) may be acceptable in certain circumstances based on the assessed risk and the local situation. Strict domestic travel restrictions to prevent disease spread may only be acceptable in an epidemic or pandemic with the characteristics of the 1918 pandemic virus or worse. When implementing certain public health measures such as isolation and quarantine of international travellers, the relevant provisions of the International Health Regulations (2005) should be considered by WHO Member States, including how to treat travellers with courtesy and respect, including ensuring fundamental freedoms of international travellers.

In summary, balanced decisions on whether a public health intervention should be implemented, and on when to start and stop the intervention, should be made on the assessed situation of individual countries.

**Figure 3: Matching cost and consequences of interventions with level of risk**

*(An example to guide decision-making processes)*

Please note that the above examples serve only to illustrate the process and use of risk assessments in guiding decision-making. They do not necessarily represent the views of WHO on the level of risk for each respiratory pathogen, or the measures that countries should take concerning each risk level. Figure 2 does not indicate the likely success of an intervention. Some countries may wish to include cost-benefit analysis or other analysis for decision-making on public health measures.
### Annex 2: Individual/household public health measures: decision matrix

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<tr>
<th>Options/Purpose</th>
<th>Benefits/Advantages</th>
<th>Limitations/Disadvantages</th>
<th>Decision (Yes/No/Wait)</th>
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| **1. Personal protective measures**<br>To reduce respiratory infection and decrease acute respiratory disease spread | - Protect individuals from respiratory infection, including influenza  
- Less controversial  
- None or few social and economic consequences in comparison to societal measures  
- Wider benefits by reducing infections from other respiratory pathogens (in addition to influenza) | - Low compliance in some social and cultural contexts  
- Hand-washing requires facilities and supplies (e.g. soap) in schools, workplaces and public places  
- Need major sustained advertising and an effective risk communication strategy to sensitize people | (Yes) |

**Comments and guidance:**

Options for promoting personal protective measures include:

- targeted or prioritized personal protective measures  
- comprehensive personal protective measures.

Respiratory hygiene and cough etiquette as infection control measures for individuals are always strongly encouraged, as they help prevent the transmission of all respiratory infections, including the new influenza A(H1N1) infections. While certain individual measures such as cough etiquette are less controversial and generally acceptable, others such as gargling may be more controversial. There is currently no or limited evidence to indicate the effectiveness of gargling for preventing viral transmission, although it may be practised by individuals based on social and cultural context. Generally, there are two groups of individual measures related to the new influenza A(H1N1) with two different objectives: (1) to protect oneself from infection; (2) to prevent infection to others when ill. The following are some examples of personal protective measures:

- avoiding and limiting contact with ill persons especially those with influenza-like illness and acute respiratory illness  
- hand hygiene (e.g. wash hands with soap and water or alcohol-based rub, if available)  
- correct use of surgical masks based on risk of exposure (e.g. when in close contact with an ill person who is unable to wear a mask)  
- cough/respiratory etiquette (cover coughs and sneezes) to prevent infection to others  
- use of surgical masks by ill persons if they have to be in contact with others  
- other hygiene measures that fit local social and cultural contexts and needs (including no spitting).

A national strategy on risk communication, or health education/promotion or communication for behavioural impact, should be used as an effective means to promote individual healthy behaviours including compliance with personal hygienic measures.
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| 2. **Isolation of ill persons** (particularly home isolation) | • Reduction in and slowing of community transmission  
• Less costly than health facility-based isolation  
• Relieves burden on health care system  
• Less stressful on individuals to be isolated at home than elsewhere  
• Home isolation has potentially higher public acceptance than other isolation options  
• Voluntary isolation is more acceptable than mandatory isolation  
• Avoid nosocomial transmission | • Health monitoring and reporting system required  
• Potential risk to other household members  
• Services must be available to provide basic necessities to those who live alone or have special needs. Support systems are needed such as delivering food and medicines.  
• Difficult to monitor compliance  
• Need alternative arrangements for non-residents  
• Not feasible for severe cases  
• May need legal framework to implement  
• Perception of discrimination | |
Based on current evidence, it is likely that individual adults infected with the new influenza A(H1N1) virus are infectious one day before onset of symptoms to seven days after onset. The length of isolation may be adjusted as knowledge about the virus increases and a better understanding of the effectiveness of antiviral medications in reducing the amount of virus an individual sheds. Children and the elderly may be infectious for a longer period. Infection prevention and control measures related to home care should be followed based on national and international guidelines available.

A range of issues that promote compliance should be considered:
- appropriate information on the use of hygiene and infection control measures in the home setting
- timely and effective risk communication
- commitment of employers to support the recommendation that ill workers and their caregivers stay home
- support for the financial, social, physical and mental health needs of ill individuals and caregivers
- appropriate information on how to care for someone at home and when and where to seek medical care should be readily available
- support for individuals who live alone and may be unable to care for themselves.

Countries will need to develop and provide practical guidance on home isolation and caring for an ill person at home, based on national policy and local context. National policies for isolation of ill persons should remain flexible and be adapted to changing or re-assessed risk and situation.
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<td><strong>3. Quarantine of household members and contacts</strong>&lt;br&gt;<em>To reduce community transmission by decreasing contact between potentially infectious and non-infected persons</em></td>
<td>• Possible reduction in and slowing of community transmission at the early stage of outbreak&lt;br&gt;• Studies support the effectiveness of voluntary household quarantine&lt;br&gt;• Voluntary quarantine is generally more acceptable than mandatory quarantine</td>
<td>• May have financial, social, physical and mental impact on households&lt;br&gt;• May disrupt normal social functioning&lt;br&gt;• Unlikely to have any effect when wide community-level outbreaks are occurring&lt;br&gt;• Resource-intensive for facility-based or mandatory home-based quarantine&lt;br&gt;• Need for support of people under quarantine&lt;br&gt;• May need to have in place legal framework if mandatory quarantine is to be implemented&lt;br&gt;• Perception of discrimination</td>
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**Comments and guidance:**

Options for quarantine of household members and contacts include:
- □ advise household members and close contacts of probable or confirmed cases to stay home for an incubation period (e.g. 7 days) and to minimize their contact with others in the community
- □ advise household members and close contacts of suspect cases to stay home and to minimize their contact with others
- □ mandatory home-based quarantine
- □ facility-based quarantine of all contacts
- □ no quarantine measures to be implemented once community-level outbreaks are occurring.

Identification of close contacts often requires contact tracing, which is resource intensive and becomes impossible when large outbreaks, especially community-level outbreaks, are occurring. Members of households with probable or confirmed cases of influenza A(H1N1) as close contacts may be at increased risk of infection. A significant proportion of these people may shed virus and be at risk of infecting others in the community despite being asymptomatic. Quarantining these household members for a period of 7 days following symptom onset in the ill household member may reduce this risk. Some persons may experience a longer period of quarantine if multiple household members become ill over an extended period of time. Quarantine measures need to be applied in conjunction with hand and respiratory hygiene measures as well as infection control measures at home to minimize transmission risk.
A range of factors that may be considered for voluntary compliance:

- timely and effective risk communication
- commitment of employers to support the recommendation that members of households/close contacts with a probable or confirmed case stay home
- essential services and support for the financial, social, physical and mental health needs of household members and close contacts who live alone
- appropriate information on hygiene and infection control in a home setting
- adherence to ethical principles in the use of quarantine and proactive anti-stigma measures.

Mandatory quarantine of large numbers of contacts in designated facilities such as hotels is generally not recommended, as it is extremely resource intensive and may have significant social, economic and legal consequences. However, some countries may chose this option based on national law and guidelines at the initial stage of an outbreak.
4. **Infection prevention and control in the home setting**

*To prevent infection from ill persons and reduce the risk of exposure in the home setting*

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| **To prevent infection from ill persons and reduce the risk of exposure in the home setting** | • May help reduce potential burden of infection prevention and control in the health care facilities  
• May increase public awareness and skills on following standard precautionary measures in non-health care facility settings  
• May help promote social and community support network | • Need to train caregivers on patient management, infection prevention and control in the home setting  
• Need to manage referral to health care facilities, when indicated  
• Need to manage essential supply of personal protective equipment, etc.  
• Risk of household transmission | |

**Comments and guidance:**

Once a disease is spreading widely, for example, if community-level outbreaks are occurring, many cases (especially mild) would need to stay home instead of being isolated in health care facilities. At this stage, infection prevention and control measures and patient management at home becomes important components of public health interventions to reduce further spread. Ill persons at home should be cared for by designated caregivers (such as parents taking care of ill children). Standard precaution measures should be applied when caring for probable and confirmed cases in the home.

Countries will need to develop simple and practical guidance for caregivers that is consistent with relevant national guidelines on case management and infection prevention and control. Such guidance may include information on:

- the nature and mode of transmission of influenza viruses (e.g. mainly via respiratory droplets)
- medications needed or not needed (e.g. most mild cases do not need antiviral drugs, avoid use of aspirin in children/youths)
- when and how to seek medical care
- precautionary measures to reduce the spread of influenza in the home setting
- placement of an ill person in the home setting
- use of masks by ill persons and caregivers based on risk of exposure
- household cleaning, disinfection and waste disposal (see other guidance documents)
- self-monitoring of health (e.g. monitoring temperatures of caregivers) and reporting of illness.
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<tr>
<td>5. <strong>Use of masks in the community setting</strong>&lt;br&gt;To reduce infection from ill persons and reduce the risk of spread</td>
<td>• Correct use of masks may help protect contacts from possible infection&lt;br&gt;• Use of masks by ill persons may prevent infection to others&lt;br&gt;• Increase public awareness about the disease&lt;br&gt;• May meet individual needs based on local cultural context</td>
<td>• Inappropriate use of masks in open public places have limited public health benefits and waste national and individual resources&lt;br&gt;• May cause unnecessary public fear and anxiety&lt;br&gt;• Incorrect use may increase the risk of transmission&lt;br&gt;• Need to manage safe disposal of large number of used masks&lt;br&gt;• May cause stigmatization of the mask wearer in some social and cultural context&lt;br&gt;• May give a false sense of security</td>
<td>Yes/No/Wait</td>
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**Comments and guidance:**

Options for use of masks in the community setting include:

- use of masks only based on the risk of exposure
- use of masks only by ill persons, caregivers and close contacts
- use of masks by the public (non ill persons) in crowded public places
- use of masks by defined groups (e.g. essential company employees) or by general public in the community, especially in open areas (which has no established benefits).

Past and current experiences indicate the need for appropriate use of masks based on risk assessment. At present, evidence suggests that the main route of human-to-human transmission of the new influenza A(H1N1) virus is via respiratory droplets. Any person who is in close contact (approximately 1 metre) with someone who has influenza-like symptoms is at risk of being exposed to potentially infective respiratory droplets. Irrational or incorrect use of different types of masks has limited public health benefits and may waste limited resources that are needed for other more effective public health measures. Appropriate use of masks based on risk including frequency of exposure and closeness of contact with ill persons is important, especially for resource-poor countries. Individuals may make personal choices on the use of masks in public places based on individual needs and resources under certain social or cultural contexts. Health authorities should ensure the availability of masks in health care settings.

WHO has published interim advice on the use of masks in the community setting in influenza A(H1N1) outbreaks (3 May 2009).
### Annex 3: Societal public health measures including social distancing: decision matrix

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<th>Option/Purpose</th>
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| 1. Suspension of classes                     | - May help reduce transmission among children and decrease disease spread to the community, as students appear to be efficient transmitters of influenza  
- Some historical data (e.g. the 1918 pandemic in the United States) indicated that class suspensions delayed the pandemic peak and decreased the overall number of deaths  
- Various modelling studies indicated various success for class suspensions as a disease control  
- May be more effective if implemented at the early stage of an outbreak or epidemic and in conjunction with other individual and societal interventions  
- May be more effective if the attack and mortality rates are higher in school-age children  
- May work better in rural or less people-dense areas  
- Public health agencies have the authority to implement this measure in coordination with education authorities in many countries | - Predicting the effects of suspension of classes is difficult  
- Some studies indicated that school closure had limited effectiveness in decreasing seasonal influenza spread  
- May require legal authority to suspend classes  
- Need strong support from other sectors (e.g. education authorities and employers)  
- Need to develop strategy to avoid "secondary gathering" of students outside the school setting  
- May need to arrange alternate education programmes or provision of other services provided by schools (e.g. supplemental meals for students)  
- Students may miss key-stage exams (e.g. school-entry exams)  
- Parents who are essential workers may be diverted to take care of their children  
- Low-income parents may lose their basic income  
- May cause public anxiety and psychosocial stress of students | Yes |

*To protect children, reduce transmission or delay spread of disease to the community*
Comments and guidance:

Options for suspensions of classes include:

- Advise only ill children, school students and faculty staff to stay home (no school closure)
- Suspend those classes which contain confirmed or probable cases of influenza A(H1N1)
- Dismiss classes in which influenza A(H1N1) cases are confirmed in the school(s)
- Dismiss classes in the community in which outbreaks are occurring (e.g. a district)
- Dismiss classes in administrative areas (e.g. city, district, province, prefecture) with confirmed cases
- Pre-emptively close schools in unaffected areas
- Dismiss classes in the whole country (e.g. nationwide school closure in small Pacific island countries and territories).

Options for types of classes to be suspended or schools to be closed (may depend on age-specific attack rates) include:

- Only child care programmes
- Only primary and secondary schools
- Both child care and school programmes
- All schools, colleges, universities and vocational programmes.

Suspension of classes and school closures have been used in past pandemics (like USA) and during seasonal influenza outbreaks in some countries and areas (like Japan and Hong Kong [China]). The effectiveness of this intervention may depend on many factors such as the epidemiological features of the disease (e.g. the attack rates in school-age children), the level of transmission, the rural or urban setting, the timing to start and stop the measure, and whether it is applied in conjunction with another intervention. Past experiences and various modelling studies indicate suspension of classes may play a role in decreasing the number of cases and deaths, delaying the outbreak peak and slowing down the spread. In many countries, school closures are acceptable and feasible, for example, extended families may be available to look after children while parents continue working.

Currently, there is no definite experience and opinions on timing of suspending classes. Modelling evidence for when is the best time to close the schools is very inconclusive. Countries will need to decide triggers for class suspensions and school closures and their re-opening based on the level of community transmission. Some countries may decide to close schools if one or more cases are confirmed by local public health authorities in one or more schools or in the local community. The type and duration of school dismissal and closure depend on the epidemiological information, disease severity and country context. In response to the new influenza A(H1N1), a number of countries including USA, Japan and the United Kingdom have closed selected schools for about 7 days. Some countries may decide to close schools before influenza is demonstrated to be widespread in school settings. Countries will also need to plan for re-opening of schools and management of possible re-introducing new cases in school settings.

Countries need to balance the potential public health benefits against potential social disruptions caused by suspending classes. Closure of schools has a high social cost. It may also raise a range of ethical and social issues particularly as families from under-privileged backgrounds are likely to be disproportionately affected by the intervention. Decisions should be based on the assessed country situation. Some countries may be ready to manage possible high social and economic costs to benefit from the potential reduction in cases by closing schools. However, the countries should carefully consider the impact that the intervention might have on key workers and on emergency management capacity. For example, school closures might lead to relatively important reductions in cases during the outbreak peak, therefore reducing the burden on the health care system when the stress on
services is maximum. However, these benefits should be weighed against the potential disruption caused to the health services due to increased absenteeism of the health care workforce. Experts concluded that more work is needed to evaluate the impact of school closures on health care and other essential services.

Advanced planning is required and should involve the participation of other sectors, e.g. education authorities. The business sector should also be involved so that it is prepared for employee absenteeism because of child care responsibilities.

If implementing the intervention, the following combined measures and social services may help achieve public health benefits and minimize the consequences of class suspensions or dismissals:

- implementing personal hand and respiratory hygiene measures
- advising students, parents and school staff to monitor their health daily (especially those who may be exposed to ill persons)
- advising students, parents and school staff to report to local public health authorities if symptoms of ILI or acute respiratory illness develop
- coordinating with other school districts to avoid confusions
- implementing feasible alternatives for school education programmes (such as distance-learning packages, or TV education programmes)
- implementing measures to avoid “secondary gatherings” outside the school setting (or out-of-school social gatherings)
- supporting parents who need to stay home from work to supervise and care for children
- minimizing the duration of school closure, based on the assessed risk
### Options/Purpose

**2. Adjusting or changing work patterns**

*To reduce community transmission risk and decrease spread of disease in the workplace*

<table>
<thead>
<tr>
<th>Benefits/Advantages</th>
<th>Limitations/Disadvantages</th>
<th>Decision (Yes/No/Wait)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• May reduce transmission and disease spread in the workplace</td>
<td>• No direct evidence to indicate effectiveness</td>
<td></td>
</tr>
<tr>
<td>• May reduce transmission in public transportation systems by reducing overcrowding</td>
<td>• Need policy and legal support to implement this measure in many countries (e.g. work from home)</td>
<td></td>
</tr>
<tr>
<td>• Responsibility for action shared among government, companies and individuals</td>
<td>• Requires effective communication with the private sector to support implementation of this measure</td>
<td></td>
</tr>
<tr>
<td>• May reduce transmission in public transportation systems by reducing overcrowding</td>
<td>• Potential loss of income or job</td>
<td></td>
</tr>
<tr>
<td>• Responsibility for action shared among government, companies and individuals</td>
<td>• Does not include the non-formal sector of the economy which can be the majority in many countries</td>
<td></td>
</tr>
<tr>
<td>• Responsibility for action shared among government, companies and individuals</td>
<td>• Relies on technology for working from home which may be expensive or not available</td>
<td></td>
</tr>
</tbody>
</table>

**Comments and guidance:**

Options for changing work patterns include:
- □ allow all ill people to stay home (do not go to work in the office)
- □ encourage employee to work from home if possible
- □ change work hours or schedules to avoid use of crowded public transport systems or to reduce travel during peak hours
- □ increase social spacing in the workplace (reducing the crowding office working environment)
- □ implement other innovative work patterns based on local infrastructure and social/cultural context.

Adjusting or changing work patterns is really a much more complex area. Countries will need to decide triggers for changing work patterns and may need to provide infrastructure support (e.g. internet and telecommunication services). Countries may decide to start implementing this measure once there is confirmed wide community-level transmission. Duration of implementation will depend on the changing situation. Such measures may be lifted once the epidemic or pandemic peak is over.

Countries may need to develop and implement necessary policy and strategies to maximize the public health benefits and minimize the consequences of this measure, such as ensuring job security and minimizing income loss. The support of employers, political and business leaders is essential. Improving infection prevention and control practices in the workplace is necessary.
<table>
<thead>
<tr>
<th>Options/Purpose</th>
<th>Benefits/Advantages</th>
<th>Limitations/Disadvantages</th>
<th>Decision (Yes/No/Wait)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Restriction of public or mass gatherings&lt;br&gt;&lt;br&gt;<em>To reduce community transmission and delay the spread of disease in the community through deceasing the number of human contacts</em></td>
<td>• May reduce number of infections&lt;br&gt;• May reduce or delay the spread of disease in the community&lt;br&gt;• Historical data indicate that the measure might be effective if implemented in conjunction with other interventions as part of a package and in a timely manner (e.g. the 1918 pandemic in the United States)&lt;br&gt;• High compliance can be achieved if the disease is severe and high attack rates and case fatality ratios are observed</td>
<td>• Limited and conflicting evidence to support the measure (e.g. the 1918 pandemic in Canada)&lt;br&gt;• A review by the European Centre for Disease Prevention and Control (ECDC) in 2007 concluded that there was not enough data to make an informed decision on the measure&lt;br&gt;• May need legal authority to restrict gatherings&lt;br&gt;• May cause public anxiety, fear and even panic&lt;br&gt;• May cause social disruption and negative economic impact&lt;br&gt;• May not be sustainable if the pandemic wave is very long, especially if gatherings are considered &quot;essential&quot; (e.g. public transportation)&lt;br&gt;• Level of compliance depends on social and cultural context&lt;br&gt;• Some public gatherings are difficult to avoid (e.g. food markets)&lt;br&gt;• Restriction of all public or mass gathering is not feasible&lt;br&gt;• May need to identify compensation mechanisms for organizers and ticket holders of cancelled events</td>
<td></td>
</tr>
</tbody>
</table>

Comments and guidance:
Options for restricting public or mass gathering include:
- postponing, cancelling or modifying only selected and main types of public or mass gathering based on the assessed situations
- postponing, cancelling or modifying all public or mass gatherings when community-level outbreak is occurring.

Decreasing or limiting the number of human contacts should reduce the transmission of the disease. However, there is very limited evidence to show the effectiveness of restricting mass gatherings. Some data including modelling studies have shown conflicting evidence.

Factors to be considered include patterns of mass gatherings, venues (indoor or outdoor) and feasibility of restriction. Countries will need to make national decisions on the measure based on a balanced decision-making process and an assessment of the country situation. Countries will need to define triggers for starting this measure and mechanisms for stopping it. Different countries may have different patterns of public or mass gatherings. In general, indoor public gatherings cause more concern than outdoor gatherings due to potentially poor ventilation and air quality of indoor venues.

Public gatherings may include public (food/street) markets, entertainment events, religious gatherings, mass public transportation services such as public bus and subway, and other social events or venues where a large number of people gather indoors in close proximity.

Countries may decide to restrict, postpone, cancel or modify various types of public or mass gatherings when the local public health authority confirms that human-to-human transmission of influenza A(H1N1) is occurring in the community. Implementation of this measure requires effective risk communications to increase public awareness, public perception about benefits and risks.

Countries should plan and implement strategies and measures that will minimize the consequences of restricting public or mass gathering. Such measures may include:
- promoting universal precautionary measures (understanding the risk associated with overcrowding itself may encourage people to stay at home)
- implementing feasible alternative programmes to minimize disruptions of important social functions (e.g. broadcast programs to deliver religious services)
- adjusting working patterns to reduce the use of crowded public transportation (such as work from home, if feasible)
- identifying other measures to avoid unplanned or unexpected secondary "gatherings".
### 4. Domestic travel advisories and restriction

**To reduce or delay spread of the disease within a country**

<table>
<thead>
<tr>
<th>Options/Purpose</th>
<th>Benefits/Advantages</th>
<th>Limitations/Disadvantages</th>
<th>Decision (Yes/No/Wait)</th>
</tr>
</thead>
</table>
| Domestic travel advisories and restriction                                      | • Increase public awareness about the disease  
• Help reduce or delay the spread of the disease if a very large-scale travel restriction is implemented  
• Allow non-affected areas (e.g. city or provinces) to "buy time" to prepare and implement their community mitigation measures  
• May delay the introduction of the virus into areas with large numbers of high-risk residents | • Effectiveness is unknown and highly social and cultural context specific  
• The intervention is controversial  
• May have significant negative consequences at economic, societal and community levels  
• May cause public anxiety, fear and panic  
• Difficult to define "affected" areas in relation to influenza A(H1N1)  
• Difficult to determine when to lift restrictions (especially if total isolation has been implemented and area has remained disease free).  
• May need legal framework  
• Social stigmatization | Yes/No/Wait |

#### Comments and guidance:

Options for domestic travel advisories and restriction include:
- advisories discouraging ill individuals from travelling
- advisories discouraging non-essential travel to selected areas if large areas of a country remain unaffected
- restrictions of all travel from or to selected areas
- restrictions of all travel within a country
- delay in recovery.

Countries will need to decide triggers and options for domestic travel advisories and/or restrictions based on country risk assessment (including pandemic severity), social, economic and cultural context. The type and duration of travel advisories and/or restrictions may depend on local epidemiological information of the disease and specific geographical conditions (e.g. remote areas). Countries may decide to implement these measures before the disease in the country is demonstrated to be widespread. The likely effectiveness of measures based on restricting domestic travel is highly context specific. Once the virus is widespread, travel advisories and restrictions may be ineffective and unnecessary, as they will have little impact to control the disease in that country. Countries may only consider these measures when outbreaks or epidemics are severe and may cause severe impacts on population.

If countries decide to implement this measure when it is really needed, they will need to ensure measures that will maximize public health benefits and minimize negative consequences of travel advisory and restriction measures, such as:
• promoting universal precautionary measures and appropriate health-seeking behaviours (through risk communication programme)
• advising and promoting "healthy" travel if travel is unavoidable (e.g. avoiding contact with any ill persons and avoiding crowded places)
• advising travellers to monitor their health and report any illness (such as ILI and acute respiratory illness)
• develop and implement alternative activities (e.g. virtual meetings via teleconference, TV and Internet programmes)
• increase the frequency of local public transportation to decrease travel density
• reschedule working hours if possible to avoid overcrowding of the mass transport system
• allow work at home, if possible, to avoid overcrowding of the mass transport system
• increase social spacing when travelling.

In the face of the current situation of the new influenza A(H1N1), WHO does not currently recommend international border closures or international travel restrictions. It is considered prudent for people who are ill to delay international travel and for people developing symptoms following travel to seek medical attention. For updated advice, please visit the WHO website on the new influenza A(H1N1).