



# Public health measures during the influenza A(H1N1)2009 pandemic

## MEETING REPORT

### WHO Technical Consultation

26–28 October 2010, Gammarth, Tunisia



World Health  
Organization



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# Executive Summary

In order to learn from the experiences of Member States in the implementation of public health measures during the influenza A(H1N1)2009 pandemic, the WHO Global Influenza Programme held a workshop in Gammarth, Tunisia, 26–28 October 2010. Information and findings from this workshop will inform the revision of the pandemic preparedness and response guidance. Experiences were shared by 15 Member States, five UN agencies and three International Organizations.

Key themes emerged from the discussions.

- The need and usefulness of inter-sectoral collaboration involving all stakeholders during the planning, implementation and evaluation of all intervention activities was stressed.
- The experiences shared demonstrated the wide variety of governance structures and resources available. Guidance should take these differing structures into consideration.
- While well-prepared national plans were generally available, sub-national plans were not always available nor linked across sub-national areas, leading to conflicting messages and inconsistent application of measures.
- The mild nature of the influenza A(H1N1)2009 pandemic and its low mortality rate clearly affected the use of guidance which was designed for response to a more severe disease.
- The evaluation of implemented measures varied by methodology and used different indicators with largely subjective outcomes.
- There was a strong desire to follow up on evaluation of measures with the development of standardized evaluation tools, taking into consideration current surveillance systems in the Member States.
- A methodology for measuring the economic costs of interventions and the overall pandemic should be taken into account during pandemic preparedness.
- Implementing interventions throughout the crisis reinforced the capacity of Member States' response agencies and coordination mechanisms.
- It was recognized that preparation, training and making necessary provisions had a positive effect on the development of mass gathering events. WHO guidance was used extensively in planning.
- Guidance needs to be tailored to the specific mass gathering event, taking into account the dynamics of varying types of gatherings, their settings and their associated risks.
- In the case of sporting events, H1N1 was considered a potential 'game stopper', with enormous social, political and economic implications along with potential effects resulting from player illness. However, advance planning and interventions resulted in highly successful events.
- There is a need to know much more about respiratory infection risks associated with mass gatherings.



- Evaluating the effectiveness of border health/temperature screening during the pandemic was difficult, especially in the absence of counterfactual analyses; i.e., analyses of what would have happened if the intervention had not occurred.
- Points-of-entry temperature screening was the most controversial intervention, with significant human resource implications and variable effectiveness evaluations ranging from of little usefulness to highly effective.
- Public information and communication strategies are crucial in any response to a pandemic. This could well determine the public response. The sharing of best practices, particularly in dissemination of public messages could be time and cost saving.

# Background

Influenza epidemics and pandemics can result in substantial health (clinical illness, hospitalization, deaths) and socioeconomic (absenteeism, decrease in productivity, decrease in travel and trade) impacts. With globalization, diseases tend to spread rapidly; when they become pandemics, they can quickly affect large populations to greatly multiply these impacts across countries and regions. This was demonstrated by the severe acute respiratory syndrome (SARS) outbreak in 2003 and the influenza A(H1N1)2009 pandemic, both of which were caused by novel viruses. In both cases, international travel was significant for the global dissemination of the virus.

At the time when the novel A(H1N1)2009 virus emerged, experts initially looked into, and relied on, measures to delay or contain the spread, hoping to minimize the impact while efforts were ongoing to better understand the epidemiology, clinical course, treatment and its outcomes, as well as the potential development of a vaccine.

Early in the influenza A(H1N1)2009 outbreak, the World Health Organization (WHO) issued guidance on public health measures that could be applied to reduce or delay the transmission of the outbreak at individual/household and community levels and in situations where individuals may congregate such as schools or mass gatherings. In guiding Member States on pandemic influenza preparedness and response, WHO developed a full range of guidance documents to comprehensively address these measures using a consultative approach.<sup>1,2,3,4,5,6,7,8,9</sup> They range from information contained in specific guidance documents such as the pandemic influenza preparedness and response guidance and the International Health Regulations (IHR 2005) to tools and strategies developed from expert scientific consultative meetings.

As WHO undertakes planning to prepare for the revision of the pandemic preparedness guidance, it is imperative to take stock of lessons learned by Member States and experts who implemented or researched specific public health measures during the influenza A(H1N1)2009 pandemic.

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- <sup>1</sup> *Pandemic influenza preparedness and response. WHO guidance document.* Geneva, World Health Organization, 2009.
- <sup>2</sup> *Reducing transmission of pandemic (H1N1) 2009 in school settings: A framework for national and local planning and response.* Geneva, World Health Organization, 2009.
- <sup>3</sup> *WHO Consultation on suspension of classes and restriction of mass gatherings to mitigate the impact of epidemics caused by the new influenza A (H1N1). Summary of the third scientific teleconference on influenza A (H1N1).* Geneva, World Health Organization, 2009 ([http://www.who.int/csr/resources/publications/swineflu/who\\_consultation\\_20090624\\_en.pdf](http://www.who.int/csr/resources/publications/swineflu/who_consultation_20090624_en.pdf), accessed 12 October 2011).
- <sup>4</sup> *WHO and UNICEF. Behavioural interventions for reducing the transmission and impact of influenza A(H1N1) virus: A framework for communication strategies.* Geneva, World Health Organization, 2009.
- <sup>5</sup> *WHO checklist for influenza pandemic preparedness planning.* Geneva, World Health Organization, 2005.
- <sup>6</sup> *International Health Regulations (2005), 2nd ed.* Geneva, World Health Organization, 2008.
- <sup>7</sup> *Advice on the use of masks in the community setting in Influenza A (H1N1) outbreaks: Interim guidance.* Geneva, World Health Organization, 2009 (<http://www.who.int/csr/resources/publications/Adviceusemaskscommunityrevised.pdf>, accessed 12 October 2011).
- <sup>8</sup> Statement by the WHO Director-General, Dr Margaret Chan, 27 April 2009 ([http://www.who.int/mediacentre/news/statements/2009/h1n1\\_20090427/en/index.html](http://www.who.int/mediacentre/news/statements/2009/h1n1_20090427/en/index.html), accessed 12 October 2011).
- <sup>9</sup> Is it safe to travel? 27 November 2009 ([http://www.who.int/csr/disease/swineflu/frequently\\_asked\\_questions/travel/en/](http://www.who.int/csr/disease/swineflu/frequently_asked_questions/travel/en/), accessed 12 October 2011).



It is in this light that the WHO Global influenza Programme held a meeting to bring together public health experts who were engaged in implementing the different public health measures during the influenza A(H1N1)2009 pandemic.

The objectives of the meeting were to:

- collate information on public health measures implemented during the influenza A(H1N1)2009 pandemic by providing a forum for stakeholders to share data and experiences,
- collect information that will inform the updating of the WHO preparedness and response guidance on public health measures during an influenza pandemic and
- identify gaps in knowledge of public health measures that require further studies.

Ultimately, the inputs from the forum would not only enrich the pandemic preparedness guidance revision process but also ensure the finished product adequately addresses the experiences of the Member States in their efforts to manage pandemic influenza.

The workshop covered four broad areas: mass gatherings, travel and trade interventions, school-based interventions and behavioural interventions.

# Mass gatherings

## 1. Key factors/observations

The definition of a mass gathering is generally accepted to be an organized event of more than 1000 (from 1000 to 25000 or more)<sup>1</sup> people at a specific location for a specific purpose for a defined period of time. Mass gatherings can be classified into various types according to whether they are spontaneous (e.g. a state funeral) or planned – recurrent at different locations (e.g. the Olympics) or recurrent at the same location (e.g. Wimbledon, Hajj).

While mass gatherings represent challenges to public health, they nonetheless provide an opportunity for improving public health planning overall and for enhancing preparedness and health promotion around a number of areas, including physical activity, anti-tobacco and disease specific awareness raising. The challenges posed include unusual population increases in constricted spaces, a stress on the routine public health infrastructure, high crowd density and international visitors along with the presence of temporary catering and accommodation facilities. Risk communication may also be a challenge in terms of culture, language, media and political pressure due to the international spotlight on these events.

## 2. Current guidance

The general objectives of interventions for mass gatherings are to detect index cases, prevent outbreaks, reduce spread, establish a decision-making process that allows rapid decisions regarding the event, monitor the situation and its evolution, diagnose and treat infected individuals and disseminate relevant public health messages.<sup>1</sup> The specific aims of interventions during the pandemic were to detect and monitor event-related pandemic influenza cases, to reduce its spread, to manage and treat ill persons and to keep the public informed.

Risks posed by mass gatherings are those due to the concentration of a large number of people and include the likelihood of disease transmission from person to person, possible introduction of non-endemic diseases, rapid geographical spread due to population dispersal during and after the event and export of endemic diseases back to non-immune populations.

Risk assessment is crucially important as the basis for deciding whether or not to go ahead with a particular mass gathering. Decisions depend on inputs from a wide variety of sources and involve a wide range of stakeholders due to the multi-sectoral nature of mass gathering events. Risk assessment should be based on certain factors including the number of participants, the population density, whether the event takes place indoors or outdoors, its duration, the nature of the accommodation provided and the country's/city's ability to address the risk.

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<sup>1</sup> *Interim planning considerations for mass gatherings in the context of pandemic (H1N1) 2009 influenza*. Geneva, World Health Organization, 2009 ([http://www.who.int/csr/resources/publications/swineflu/cp002\\_2009-0511\\_planning\\_considerations\\_for\\_mass\\_gatherings.pdf](http://www.who.int/csr/resources/publications/swineflu/cp002_2009-0511_planning_considerations_for_mass_gatherings.pdf), accessed 12 October 2011).

### 3. Range of events – interventions

Experiences from a range of mass gatherings coinciding with the influenza A(H1N1)2009 pandemic were shared. The mass gatherings that were discussed included planned recurrent events at different locations such as the Universiade in Serbia, the IPL Cricket Tournament, the FIFA World Cup 2010 in South Africa as well as planned recurrent events at the same location such as the EXIT music festival in Serbia and the Zion Christian Church Easter celebration in South Africa.

In the case of the sporting events, H1N1 was a potential ‘game stopper’, with enormous social, political and economic implications along with potential effects resulting from player illness. In other mass gatherings, planning aimed at setting criteria for cancellation and for isolating suspect cases, as well as promulgating recommendations for travellers and delegations coming to the event.

In the risk assessment conducted for the FIFA World Cup, concerns were mitigated somewhat by the fact that the matches took place outdoors in well-ventilated spaces. The 2010 World Cup, in particular, coincided directly with the flu season, with an increase in influenza detection and cases of H1N1 beginning in July 2010 immediately after the event ended. It would be interesting to determine why this increase occurred and whether it can be traced to the World Cup specifically or the re-opening of schools<sup>1</sup> following the event.

Specific mass gathering interventions implemented during the FIFA World Cup included school closure during the event to ease traffic congestion, behavioural interventions, cancellation or postponement of travel and other events, pre-travel health advisories including recommendations for vaccination for teams and visitors, enhanced H1N1 surveillance, deployment of vaccine and development of vaccination strategies and post-travel health advisories. There was also border screening, health self-monitoring and compulsory reporting to an event doctor. Messages included staying away if ill, practising hand hygiene and respiratory etiquette, isolating ill persons, maintaining self-isolation and reducing crowding.

More specific interventions included writing to delegates and sports teams to inform them not to travel if ill; setting criteria for cancellation (e.g. 1% of the population diagnosed with H1N1, a case of Acute Respiratory Distress Syndrome, a death in a confirmed case); and requiring health declarations from delegates 24 hours prior to departure from their country, during travel and then daily for the duration of the event. In other mass gatherings, medical teams and Red Cross teams were involved, as was the Military Medical Academy in screening and surveillance of the sporting participants.

For the FIFA World Cup, the influenza pandemic overall had little impact in 2010. It may be hypothesised that interventions applied by well-informed and vigilant populations, as well as immunity due to the A(H1N1) infections of 2009 contributed to reducing influenza transmission.

In Serbia, more cases were identified at non-sporting mass gatherings, perhaps because high density and minimal social distancing are characteristic of these types of events (music festivals).

### 4. Effectiveness measures

In a systematic literature review conducted by the United Kingdom Health Protection Agency, historical evidence indicated that there is a statistically significant reduction in influenza transmission when mass gatherings are restricted in conjunction with other interventions such as social distancing, school closures and isolation measures.<sup>2</sup> It was not possible, however, to extract intervention-specific data to attribute effect.

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<sup>1</sup> Schools had been closed to ease traffic congestion.

<sup>2</sup> Presented by Phin N. Could influenza transmission be reduced by restricting mass gatherings? A review of scientific evidence. Health Protection Agency, United Kingdom. Gammarth, Tunisia, 2010.

**CASE STUDY – SERBIA**

**IN JULY 2009**, Serbia hosted two mass gatherings: an international sports event (Universiade) and a big music festival (the 10th EXIT festival), both of which coincided with the pandemic.

The overall objectives of the measures taken for these events were to detect the first cases, reduce spread and monitor the situation and its evolution as well as to diagnose and treat affected individuals. There was significant multi-stakeholder planning for both events, with high level participation and cross ministerial representation. Planning included determining the triggers for the closure of either event.

Plans were aimed at setting criteria for cancellation and for isolating suspect cases, along with promulgating recommendations for travellers and delegations coming to the Universiade.

Specific advice was given for delegations and travellers to the events as well as for the sporting teams and a daily reporting system (including zero reporting) was established.

In relation to cases, most of the seven confirmed cases associated with the sporting event were among athletes, while for the music festival 60 cases were identified, four of which were staff working at the site, 15 were imported, and the remainder were national attendees at the event.

It is unknown whether cancelling either event would have had an impact on the course of the pandemic in Serbia, but it is likely that the EXIT festival amplified transmission locally.

It is difficult to measure effects of individual interventions. Limited planning for evaluations, a lack of counterfactual information, and the mildness of the pandemic all presented complex challenges for measuring effectiveness. This may also explain why there were very few evaluations associated with mass gatherings. Those Member States that did evaluate their interventions assessed effectiveness by considering the number of confirmed cases.

Depending on the timing of the mass gathering in the pandemic wave/s at the national level, the virus was transmitting among international visitors before the disease presented itself in locals, suggesting that imported cases may seed local outbreaks.

## **5. Available evidence**

Limited information on the effectiveness of interventions during mass gatherings is available from the literature. The objectives of a literature review<sup>1</sup> conducted on mass gatherings were to determine if there was an association between mass gatherings and the outbreak and spread of influenza. It also assessed whether there were particular characteristics of mass gatherings that influence transmission of influenza; and whether restricting mass gatherings reduced the spread of influenza within the community compared with no restriction or other interventions.

18 articles were retained for review: five observational studies (Hajj), six outbreak reports, three historical analyses, three event surveillance reports and one quasi-experimental study (Hajj)). There was some evidence that mass gatherings increase transmission and, moreover, can 'seed' new viral strains into the host area or instigate community transmission early in the pandemic.

There was some evidence that restricting mass gatherings in conjunction with other isolation measures may reduce disease spread but it was not possible to determine the effects of restricting mass gatherings as a measure taken on its own. It was difficult to obtain evidence from the literature review on the effect of restriction of mass gatherings. However, the influence of the disease seemed

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<sup>1</sup> Presented by Phin N. Could influenza transmission be reduced by restricting mass gatherings? A review of scientific evidence. Health Protection Agency, United Kingdom. Gammarth, Tunisia, 2010.

to be greater on the athletes, musicians and support staff associated with mass gatherings, rather than on the attendees.

## 6. Lessons learned

It was recognized that WHO guidelines were used extensively in planning for the events and that preparations, training and making necessary provisions had a positive effect on the development of interventions for the mass gathering events. It was stressed that the planning process needs to involve all stakeholders at all stages.

Guidance needs to be tailored to the event, taking into account the hierarchy of different types of gatherings based on the characteristics of the event, including crowd density, duration and location i.e. whether the mass gathering is to be held indoors or outdoors, as key factors to consider in assessing risk.

For the range of possible interventions for mass gatherings for all risks, general guidance proved often to be as useful as guidance devised specifically for influenza. It was concluded that general guidance is useful but needs to be more practical and more easily adapted to each country's circumstances. It is also important for WHO to acknowledge the limitations of any guidance.

Guidance should be based on a systematic risk assessment and on interventions that should stop short of cancellation, as organizers of mass gatherings often face the impossibility of cancelling events. Appropriate recommendations should be included in the guidance accordingly. The severity of the disease and its mortality rate affect the use of guidance in decision-making.

Limitations on human resources need to be taken into account when planning implementation of public health measures. Modalities for cost efficiency during implementation, such as task sharing and human resource costs, must be kept in mind.

It is still uncertain whether cancelling the mass gatherings would have had any significant impact on the evolution of the influenza A(H1N1)2009 pandemic. There is little direct evidence to support banning mass gatherings outright, yet voluntary restrictions may help if they are part of a package of other public health measures.

## 7. Conclusions and next steps

- Mass gatherings are not homogenous, so it is important to adopt a common terminology for describing them and to develop a hierarchy for decision-making based on risk assessment factors.
- It is necessary to take account of socioeconomic and cultural factors when designing guidelines.
- There is a need to know much more about respiratory infection risks associated with different types of mass gatherings.
- It was generally agreed by the group that more flexible tools for risk assessment need to be developed, taking into account the need to reconcile differing guidance and tools from different international organizations.
- There is a need for tools and resources for evaluating and measuring the effectiveness of interventions, including appropriate use of existing surveillance systems.
- There also needs to be a specific methodology for estimating the economic costs both of interventions conducted during mass gathering events and of cancelling such events.

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# Travel and Trade

## 1. General observations

The SARS and Avian A(H5N1) Influenza outbreaks have raised awareness of the effects of infectious disease outbreaks on the travel and tourism industry. Estimates have shown that the economic burden of the influenza A(H1N1)2009 pandemic on this sector has been disproportionately high, representing 50% of the economic burden overall.<sup>1</sup> Travel and tourism has issues specific to it and the economic effects on the industry in countries are widespread.

For the implementation of screening at points of entry there are many considerations that need to be taken into account, such as providing equipment, providing dedicated ambulances, appointing nodal persons, identifying isolation hospitals, developing screening forms and deploying manpower to the points of entry.

The importance of clearly defining the goal of implementing any measures, i.e. political concerns, buying time, confidence building, medical issues, etc., was highlighted by the participants.

## 2. Current guidance

The International Health Regulations (IHR 2005) constitute a legally binding framework specifying and standardizing responses to contain public health emergencies in ways that avoid unnecessary interference with international traffic and trade. The IHR 2005 contain provisions for temporary recommendations, standing recommendations, health measures and additional measures to be taken in the event of a Public Health Emergency of International Concern (PHEIC). General measures include arrival and departure monitoring, yellow fever vaccination, conveyance disinfection, among others. The IHR 2005 operate on the principle that additional health measures implemented by states parties must achieve the same or greater health protection as WHO recommendations while meeting international law and legal obligations and must not be more restrictive on trade or travel than reasonably available alternatives that achieve the same level of protection. These measures should be based on scientific principles and on WHO guidance. If a trade or travel measure exceeds WHO recommendations, the Member State concerned is then requested to detail the intervention and provide a justification for its implementation. During the influenza A(H1N1)2009 pandemic, interventions detected through the monitoring system established to track implemented measures included: suspension of flights, travellers turned back, unjustified quarantine, discriminatory measures vis à vis travellers from selected countries, suspension of visas, refusal of entry at the point of entry, suspension of international travel, passengers held on a vessel and vessels held.

The guidance issued under the IHR 2005 is utilized by the United Nations World Tourism Organization (UNWTO), which has set up the Tourism Emergency Response Network (TERN) which helps to coordinate the response to emergencies. The network members hold meetings via teleconfer-

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<sup>1</sup> Evaluación preliminar del impacto en México de la influenza AH1N1. Documento elaborado por el equipo conjunto CEPAL/OPS-OMS a solicitud y con el apoyo del Gobierno de México. LC/MEX/L.958 [Preliminary evaluation of the impact of influenza AH1N1 in Mexico]. Mexico, Estados Unidos Mexicanos, CEPAL and Pan-American Health Organization, 2010 (<http://www.eclac.cl/cgi-bin/getProd.asp?xml=/publicaciones/xml/4/38894/P38894.xml&xsl=/mexico/tpl/p9f.xsl&base=/mexico/tpl/top-bottom.xslt>, accessed 15 May 2011).

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ence and a representative of WHO-IHR Geneva coordination team is always present. The UNWTO established influenza focal points with two-way communication and conducted simulation exercises as a basis for planning. TERN is also used for the dissemination of travel-specific messages issued by WHO to the tourism industry. For example, UNWTO implemented messages concerning responsible travel, e.g. that travel when sick is not responsible but that travel when healthy is highly recommended.

### **3. International guidance at country level**

The IHR 2005 forms the basis for signatory States Parties' activities at designated points of entry. In order to implement measures under the IHR 2005, there should be an established legal framework for public health measures at points of entry. In most Member States, all designated international points of entry are covered by a system of sanitary control and surveillance. The strategy for implementing travel and trade measures during the pandemic was to keep the virus out of the country and then to keep it from spreading once it arrived. The principles used were early detection, rapid reporting, early quarantine and timely treatment.

### **4. Range of interventions and considerations**

The measures implemented depend on many factors that include availability of resources, information, preparedness and planning. They must be adapted according to changing disease epidemiology.

Health screening methods used for both entry and exit included screening of travellers from affected areas, case-reporting aboard conveyances, parking conveyances in isolated areas, examination of symptomatic patients, hospitalization of all cases, obtaining contact details for fellow passengers, quarantine on board, completing health declaration forms, temperature screening, visual screening of travellers for signs of disease, management of exposed travellers, daily report of cases, the use of face masks, use of alcohol-based hand rubs, gowns and other personal protective equipment, and disinfection. There was also health advice provided along with alerts for travellers and clinical sample collection and transportation to laboratories for testing. Contact tracing and advice to exposed contacts was also conducted.

In most examples given, interventions changed when community transmission commenced: temperature screening was stopped; cases on board conveyances were still examined by physicians and hospitalized if severe; prophylaxis was provided for fellow passengers and there was increased emphasis on health education messages.

There were huge manpower requirements. Health professionals from the ministries of health manned the control and screening at points of entry. In many Member States, the health workforce was severely stretched according to the degree of screening.

There was an emphasis on point-of-entry screening. In one instance, a Member State stated that these screening efforts delayed the entry of the disease into the country by as much as a month and a half, giving people time to make better preparations for its arrival. In another Member State, however, evaluation revealed that 84% of cases with a travel history were not picked up at the airport. It was noted that there were no follow-up studies of these cases by using swabbing and laboratory confirmation and that the choice of denominator in the statistical analyses was a crucial element.

Evaluating the effectiveness of health screening during the pandemic was difficult, especially in the absence of counterfactual analyses. It is also difficult to evaluate the effectiveness of individual measures when, as is often the case, they are combined with other interventions. Moreover, in the case of the influenza A(H1N1)2009 pandemic, the mildness of the disease made any assessment, based on measurement or not, a difficult proposition. Participants were in agreement that only confirmed cases should be taken into account when measuring effectiveness.

**CASE STUDY – INDIA**

**UPON DECLARATION OF PHASE FOUR**, India commenced border screening at its 22 international airports. During the period from 29 April to 31 August 2009, India manually screened and recorded the temperatures of over five million incoming passengers. These screening procedures included taking histories and doing physical examinations, mandatory temperature recordings, isolating and testing suspect cases and treating confirmed cases.

From 1st September to 15th January 2010, following the commencement of community transmission in mid-June, the health interventions were removed and passenger temperature recording was done via thermal scanners. In total, throughout the two periods, over 10 million passengers were screened.

In the first phase of screening, 939 suspect cases were identified, of which 10.5% were laboratory-confirmed A(H1N1).

In order to implement this scale of intervention, 224 doctors, 151 nurses/paramedics and 100 support staff were deployed.

Community-acquired cases were not seen until 6 weeks after the declaration of Phase 4 and that thermal scanners were the only tool available for mass temperature screening.

Tools need to be developed to help in assessing effectiveness, but how this is to be done is unclear. One option is to consider economic effects as a key indicator.

The UNWTO provided estimates that while trade in Mexico declined by 12% during the pandemic, tourism declined by only 4%. Tourism was considered to have successfully weathered the pandemic.<sup>1</sup>

Given its visibility and quantifiability, border screening was an easy political decision to make despite controversy over its effectiveness. Overall it was thought that the measures implemented may have had the effect of delaying community transmission by about a week in most cases and that entry screening could help delay community spread.<sup>2</sup> Thermal scanners are believed to be the only tool available for mass temperature screening, although further research is necessary to evaluate the effectiveness of this equipment.

## 5. Available evidence

A survey<sup>3</sup> was carried out by the IHR Geneva coordination team in conjunction with collaborating agencies. It was a questionnaire survey undertaken with public health authorities, international airports, international airlines and the international maritime industry, and its main components included examinations of measures applied, effectiveness, resource requirements and the impact on international travel and transport, with questions tailored specifically to each sector.

The survey of interventions found that traveller health declarations increased to 76% of responders from a baseline of 53%, visual inspection increased from 35% to 76% and temperature screening increased from 29% pre-pandemic to 94% during the pandemic. Detection rates varied from

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<sup>1</sup> Evaluación preliminar del impacto en México de la influenza AH1N1. Documento elaborado por el equipo conjunto CEPAL/OPS-OMS a solicitud y con el apoyo del Gobierno de México. LC/MEX/L.958 [Preliminary evaluation of the impact of influenza AH1N1 in Mexico]. Mexico, Estados Unidos Mexicanos, CEPAL and Pan-American Health Organization, 2010 (<http://www.eclac.cl/cgi-bin/getProd.asp?xml=/publicaciones/xml/4/38894/P38894.xml&xsl=/mexico/tpl/p9f.xsl&base=/mexico/tpl/top-bottom.xslt>, accessed 15 May 2011).

<sup>2</sup> Appropriate studies are required to verify the interaction between entry screening and delay in community transmission.

<sup>3</sup> Presented by Gau G. Assessment of public health measures at entry points: a joint assessment. WHO, CDC, IATA, Clia, iSF, ACI, ICAO, Hamburg Port Center, Germany, Institute of Occupational Health and Maritime Medicine, Germany. Gammarth, Tunisia, 2010.

0.2/10000 to 2/10000, and overall aggregate detection rates were in the range of four cases per million passengers screened.

## 6. Lessons learned

The IHR 2005 is a useful framework and there has been improved sharing of experience internationally, as well as an upgrading of trained personnel. Decision-making should be based on risk assessment as well as on the number of cases, evidence of community transmission and the capacity to respond. It was recognised that there was a need to shift resources from containment to mitigation as the pandemic progressed.

The decision by WHO not to recommend restricting travel was seen to have had a decisive effect that was crucial to the interests of the tourism industry. Less emphasis on border screening also had a positive effect.

The biggest challenge identified was deployment of human resources for health over the course of the pandemic. Human resources deployment over a long period of time is required for point-of-entry interventions and exerts constant pressure on health and ancillary staff.

There was significant variation in the timing of interventions at points of entry. For many Member States, health screening began on 29 April and continued throughout the year, with variable triggers to terminate screening. While interventions at points of entry were highly visible and helped enhance public confidence, the impact and effectiveness in this area are not clear as lack of protocols and methodologies for effectiveness studies made any comparison of evaluations extremely difficult.

Identified problems with implementing points-of-entry measures included non-declaration of illness and self-medication to reduce fever prior to arrival, long queues for treatment and screening and passenger discontent, compounded by public expectations and pressure from the media. The focus on aviation also excluded the majority of travellers.

It was also recognized that while communication is a key element in the effort, it can promote both beneficial and negative perceptions. Because travel and trade is based on trust and belief, it is extremely important to avoid inconsistencies in communications and to be careful in the terminology used. Pandemic influenza (initially called 'swine flu') had a higher impact on the trade industry than on the tourism sector. It was also recognized that not everyone in the travel industry was cooperative with the public health efforts.

## 7. Conclusions and next steps

- The guidance offered focused too much on severe disease and, while it was useful on a national scale, it was difficult to apply at the sub-national level. The guidance available was often misinterpreted by both the public and the media.
- Points of entry have an important role in the international spread of disease and act as important sentinel sites for the early detection of infectious diseases. Point-of-entry measures can slow the spread of influenza and have contributed to early detection. It was also agreed that border screening may have been effective in delaying entry of the virus in specific countries. Screening, however, proved not to be the best tool for surveillance at points of entry and was focused on aviation, often to the exclusion of land travellers.
- WHO should design its guidelines to be more flexible and practical, promote better awareness and emphasize the need to have a plan for dealing with the secondary consequences of interventions throughout the pandemic. In addition, WHO guidance for contingency planning should continue to be developed. Plans should be updated based on scientific research and experience.
- There is a need for cooperative risk assessment and communication among designated international points of entry including a system for sharing information rapidly among Member States.

Possibilities should be explored for communication and collaboration on strategies among point-of-entry experts.

- There is a need to examine the efficacy and appropriateness of fever detection portals and thermal cameras as well as to ascertain the effectiveness of the interventions implemented. Additional studies should be designed to evaluate the health measures applied.
- WHO should revise the triggers for starting interventions and provide a protocol for terminating measures.
- There is a need for consistency in communications and especially for branding new diseases in a consistent way through a process of pre-agreed, tested names that are unrelated to any country, region or sector.
- There is a need for real-time assessment to be done during the implementation stage of public health measures. Tools and guidance on evaluation should be developed. The severity of the disease affects the effectiveness of measures and must be factored into any assessment.
- Member States should continue to strengthen their core capacities for implementation and compliance with the IHR 2005.

# School Measures

## 1. Introduction – general observations

It is important to note that the pandemic did not affect all countries the same way. Concerning measures implemented in school settings, Member States' experiences ranged from never considering closing schools to having a strong tradition of reactive school closings. Not all countries endorsed school closings at a national level.

The primary aim of school closures is to prevent disease transmission to those at high risk in that school and the surrounding community. School closings are not a stand-alone issue but are linked to an understanding that children gather together in different settings depending on their age. Closings were either proactive, triggered by WHO phases, such as an extension of school holidays, or reactive and local, generally of short duration (one or two weeks), based on absentee rates. Previous experience with school closures seemed to be important in the decision-making process.

When considering school closures the following issues were highlighted as important for the influenza A(H1N1)2009 pandemic: children as transmission focal points due to higher and longer viral shedding and as the target of higher attack rates due to lower immunity; the greater risk of complications, especially child deaths and the effect they have on the community; the possibility of spread to the wider community due to closer contact with adults and variable adherence to public health measures; the lack of clarity of the evidence concerning school closures; socioeconomic consequences of closing schools; the need to act early on in the pandemic; and the need to make sure that school measures are consistent with the evolution of the pandemic and with other public health interventions. School closures are only useful if the disease has not spread to the community; if it has, there is little justification to close the schools.

The ad hoc effects of school closures need to be considered and these include the fact that other sectors are also affected by closing schools. Kindergarten closures, for example, affect health care structures due to parents' staying home (especially nurses) and raise the issue of who cares for the children if they are not in school. Prolonged school closures affect those students who are academically challenged and interfere with the provision of school meals which provide a nutrition base without which some students are at risk. Other consequences of school closures include the possibility that school-based programs are unavailable, key exams are missed, there is pressure on essential services and an economic impact on caregivers and educators through loss of work. There is also the possibility that panic levels increase. Such measures may also become more difficult to enforce over a long period of time.

On the other hand, school closures may buy time, as was reported for Serbia where it appeared to delay community transmission by three weeks.

## 2. Current guidance

Pre-pandemic guidance from 2005<sup>1</sup> states that school closures are just one public health measure, among others, and that there needs to be a strong legal and educational basis for deciding to imple-

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<sup>1</sup> WHO global influenza preparedness plan. The role of WHO and recommendations for national measures before and during pandemics. Geneva, World Health Organization, 2005.

ment them. Likewise, there has to be good sharing of information associated with such a decision, with communication strategies to school staff, school nurses, parents and students.

During the influenza A(H1N1)2009 pandemic, WHO published a consultation report<sup>1</sup> that suggested determining the legal authority for school closures as well as recommending consideration of class suspension as an alternative. The report also counselled developing personal hygiene strategies and ensuring good communication. The overall plan for reducing transmission in schools involved a combination of advanced planning, implementation of public health measures and assessment for both class suspensions and school closures. Recommended measures included keeping sick pupils home, isolation of confirmed cases and those becoming ill at school, hand hygiene, crowd reduction, proper building cleaning and ventilation, wide dissemination of health messages and guarantees for essential services and supplies.

In terms of decision-making, WHO suggested that it be consistent, well-documented and non-discriminatory. The severity of the outbreak should be considered along with timing of implementation, student reactions, alternative activities for students, duration of the intervention and triggers both for starting and stopping the measure. The possible negative consequences should also be considered, and care must be taken to avoid discrimination. In addition, it is necessary to take the different ages of the children into account along with the different levels and characteristics of schools involved.

### 3. Policy

Before the pandemic, WHO guidance on schools was limited and national guidelines applied only to the national level. Once the pandemic started, national guidelines were used more extensively and adapted to local situations. Specific WHO advice concerning school closures was published in September 2009 emphasizing immediate action within schools such as isolation of ill students and staff and general hygiene measures, in addition to consideration of closing schools. Guidelines used in formulating interventions were a mixture of national and global ones. It is difficult to link severity to decision-making on school closures early in the pandemic, since severity is difficult to assess and can be population specific.

The decision to close a school was taken differently according to local settings, sometimes being made by the Department of Health and sometimes by the Department of Education.

The procedures for reopening schools seem to be much less well-defined than those for closing them. Decisions on closing schools were based on trends in influenza activity, such as the number of illness visits to school nurses for respiratory illness or a sudden increase in absenteeism.

### 4. Range of interventions

School closures were implemented in various ways, i.e., closing whole schools or just some classes to non-closure; most closures were reactive. Triggers were variable, closure times were based on incubation period, disease spread and severity, and often did not include protocols to reopen schools. Interventions included hand hygiene and cough etiquette, isolation and self-isolation, exclusion of sick children, use of masks and teacher training in hygiene. Other interventions included self-quarantine of students after travel, daily temperature screenings, public announcement of the outbreak and recommendations for parental isolation. Overall, schools were closed for 7–35 days.

Hygiene measures included emphasis on washing or sanitizing hands often, avoiding touching the nose and mouth, covering coughs and sneezes, making sure that bathrooms were stocked with soap and towels and sending letters to parents advising them to keep their children at home when ill. After reopening, students were monitored. In New York City, for instance, if fever and one other

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<sup>1</sup> *Reducing transmission of pandemic (H1N1) 2009 in school settings: A framework for national and local planning and response.* Geneva, World Health Organization, 2009.

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symptom were found, the student was put into house isolation. If the student had respiratory symptoms but no fever, he or she remained in the classroom but wore a mask. In Japan, school excursions requiring extensive travel were prohibited and use of air conditioning in the school was reduced in preference to open windows.

Triggers were incremental. In some countries 10–20% absenteeism in one class caused suspension of that class, while two or more classes closed in a grade caused that grade to be closed and if two or more grades were affected the school was closed. Pressure from parents was a dominant trigger in many schools, especially in big city and private schools.

## 5. Evaluations of interventions

A study of school winter holidays from 2005–9 was conducted in Argentina to estimate the potential impact of school closures and the effect of winter breaks on disease transmission in the community.<sup>1</sup> The study methodology used the observed incidence of influenza-like illness (ILI) and estimated the seasonal trends, identifying the incidence rate ratios for the weeks before, during and after the school breaks.

Preliminary results of the Argentinean study indicated that the greatest reduction of transmission among children occurred during the first week of the break, with significant reduction among all age groups during the second week. Patterns returned to normal around 3–4 weeks after schools reopened. School breaks were associated with significant reductions in ILI among children in the 5–14 year old age group. In Canada, a decrease in rotavirus infection was observed following hygiene interventions for influenza in schools. There is some evidence that school closure worked, resulting in a small decrease in ILI cases.

In other national evaluations of school measures, the effectiveness of interventions was inconsistently measured with some evaluations using ILI and others using hospitalization rates or laboratory-confirmed cases. For example, Japan carried out rigorous epidemiological analyses, the UK undertook descriptive studies of transmission patterns while New York compared closed schools with those that had influenza-like illness cases but didn't close.<sup>2,3,4</sup>

Japan concluded that it had contained H1N1 successfully at an early stage because of its proactive school closures along with event closure that provided less opportunity for people to get together. Another ingredient in this success was self-restriction and strengthened personal hygiene. Proactive school closures reduced the incidence of the disease during the first wave, giving a month's respite before the onset of the second wave, allowing time to reorganize the medical infrastructure. Despite this success, however, social and economic losses were incurred. Cost-effectiveness was analysed according to the entire cost of the disease and not just on the basis of effects on gross domestic product. For example, the cost of school closures on the 204 768 families affected was estimated at 20.84 billion yen, in addition to the loss of expenditure on public transport, tourism, the cost of rumours, and the direct economic losses which were estimated as 238.3 billion yen.

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<sup>1</sup> Presented by Echenique H. The impact of winter school breaks on the incidence of influenza-like illness in Argentina, 2005–2009, Ministry of Health, Argentina. Gammarth, Tunisia, 2010.

<sup>2</sup> Presented by Sunagawa T. Experience of proactive school closures as a part of public health interventions during early influenza (H1N1 2009) pandemic in western part of Japan. Infectious Disease Surveillance Center, National Institute of Infectious Diseases, Japan. Gammarth, Tunisia, 2010.

<sup>3</sup> Presented by Weisfuse IB. Reducing transmission of pandemic A (H1N1) 2009 in school settings: New York City. New York City Department of Health and Mental Hygiene. Gammarth, Tunisia, 2010.

<sup>4</sup> Presented by Cowling B. Summary of H1N1 school closure meeting (Angers II) – October 20th 2010, European Centre for Disease Prevention and Control (ECDC). Impact of school closures in Hong Kong. Hong Kong University. Gammarth, Tunisia, 2010.

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**CASE STUDY – NEW YORK CITY**

**SCHOOL CLOSURES WERE INCLUDED** in the pandemic preparedness guidance for New York City, which focused on a severe pandemic and school closures for up to 90 days. The concept of partial closure or class/grade closure was not considered.

Due to the large number of students returning from their vacations in Mexico, the schools were hit with the pandemic very early and had to implement measures before national policy caught up.

Communication with the 2600 schools in the district, which included producing messages in nine languages for students, school nurses, staff unions, principals and families, was a major challenge for public health officials since relevant channels had not been established prior to the pandemic.

Decisions on class and grade closure were based on surveillance of absenteeism data provided by school nurses on a daily basis. School nurses were overwhelmed by their additional tasks of health and hygiene promotion and compiling student absentee rates. Data was only available late in the day to be used for decisions concerning closures the following day. Communication with parents could therefore not be achieved through distribution of school notes taken home – the Ministry of Education preferred method – and had to be done via the media and word of mouth.

Under-reporting was a problem, as were the lack of standard indicators and the simultaneous occurrence of confounding measures. The effect of school closures on public confidence needs to be investigated.

The unevenness of the relevant data available was noted, as was the lack of data from associated sectors. There is a need to decide more clearly on what is being measured and how it is to be done. It is difficult to study the effectiveness of the measures implemented in part because this was not a priority during the response. A key message seems to be that it is essential to build evaluation of measures into the implementation of interventions.

## 6. Available evidence

In a literature review<sup>1</sup> of interventions conducted in schools during the pandemic, it was observed that measures were approached differently at different levels of government. The literature review findings indicate that school closures were either proactive – triggered by WHO phases – or reactive – based on school absentee rates determined throughout the pandemic. Other measures included self-quarantine, daily temperature screening, public announcements and parental isolation recommendations. There were few evidence-based implementation and termination triggers documented in the available literature and there were no standardized benchmarks for decision-making for re-opening schools.

The impact of the measures implemented is the subject of an on-going review. Meanwhile, a study by the European Centre for Disease Control and Prevention came to the preliminary conclusion that school closures can reduce transmission of influenza among children if implemented early enough. However, there is not enough evidence that school closures impact transmission in other age groups.<sup>2</sup> Analyses of impact must consider the effect of measures which was greater during peak periods of disease spread and the context of implementation, including socioeconomic conditions and other factors.

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<sup>1</sup> *Public health measures implemented during the influenza 2009 A(H1N1) pandemic: A literature review* (draft). Geneva, World Health Organization, 2010.

<sup>2</sup> Work by Jackson C, Mangtani P and Vynnycky E; LSHTM and HPA, presented by Nicoll A. Review of epidemiological and modelling studies on school measures. ECDC. Gammarth, Tunisia, 2010.

## 7. Lessons learned

There is a danger of over-generalizing the influenza A(H1N1)2009 pandemic experience by overlooking the intense specificity of some of its elements. It is difficult to talk about school closures without being very specific concerning locale, context, circumstances and history.

Global and national pandemic planning did not consider different levels of severity, while school closure was generally overlooked in planning. Generally, countries with experience in and a history of closing schools found communications and implementation easier than in others with no such history. Coordination with sub-national regions, although difficult because of differing governance structures, allowed for agreed and homogenous control measures that contributed to building the communities' trust.

It was recognized that had it been a more severe pandemic, interventions might have been different.

Reactive school closures were frequently implemented by closing schools for a period of time leading up to scheduled holidays, thus extending the holiday absence period. They were considered highly effective by those implementing them, especially early in the pandemic, where closure of schools early, but for a short period only, was less disruptive than closing later in the middle of school term.

Child deaths in a community seem to trigger easier decision-making for closing schools due to the need and desire to protect children.

It appeared that public acceptance of school closures was in general very high. However, the acceptability of a measure needs to be assessed at the local level since public backlash was not tested, nor were the resilience and capacity of social services. Non-influenza related positive effects included overall improvement of hygiene facilities, improvement of awareness of hygiene and cleaning methods and opportunities for health education.

There is often a lack of resources in school settings to implement health interventions. For instance, in some places there is no or limited water for hand hygiene and often no paper tissue for coughs. Provisions must be made for essential supplies to support public health measures. The possible effect on academic attainment was also noted since long-term closures can impact most on struggling students and may also interrupt school-based nutrition programs. School closures impact heavily on other sectors such as health care, because many health staff are also parents.

Measuring effectiveness was difficult in part because of under-reporting, confounding factors and a lack of standard indicators. While documentation is very spotty and not rigorously produced, it appears that school closures in the absence of other interventions are somewhat effective, although the real impact remains unclear. However, there are significant socioeconomic consequences associated with such interventions. While there was a lot of information collected during the influenza A(H1N1)2009 pandemic, there is a need to gather better data earlier on in the epidemiological cycle to help with timely decision-making.

Risk communication to the public was often challenging. It was especially difficult to communicate changes in policy as the pandemic evolved. Changing strategies might give the public a perception of authorities not being sure of their decisions, while the reality is the need to change interventions as the pandemic evolves and changes character within a certain locality.

Models can be useful but not enough to ensure a swift response and are generally simplifications. Mathematical models need to be updated on the basis of evidence from 2009 and statistical methods should be improved to control for confounders.

## 8. Conclusions and next steps

- Interventions should be linked to possible desired outcomes and to the local epidemiological situation. Any recommendation at the local level needs to be specific and flexible, and pay attention to special-needs populations. Successful implementation in any geographical area depends on the culture and population, specific to the area.
- School closures should be placed within the context of wider social distancing measures and efforts should be made to understand how these interact. These measures would include personal protective hygiene measures and continuing infection control within the schools. Triggers for school closures and re-opening need to be reviewed and incorporated into guidance.
- Implementers and local stakeholders across sectors should be involved in guideline development. The responsibility of who will make decisions at the level of the local authorities should be decided in advance of the next pandemic, while decision-making guidance should include references to the evidence in support of recommendations.
- The overriding messages can be pre-agreed, and evaluated and adjusted to the local setting, with messages developed in advance for different audiences. Messages should include the rationale for the measures being recommended. Likewise, indicators need to be revised and coupled with interventions. Mechanisms for assessing local severity should be developed, to ensure the interventions are appropriate to the local experience. More severe pandemics may require more drastic interventions, so nothing should be excluded from the tool box.
- The existence of ‘epidemic overshoot’ should be investigated to determine whether stopping an intervention accelerates the spread of the disease. A difficulty might arise in isolating the effects of stopping a particular intervention when that intervention takes place in conjunction with others.
- An operational matrix for national planning should be designed and set up along with indicators for process and impact assessment for different settings, especially in areas where resources are limited.

# Behavioural interventions

## 1. Guidance

Guidance was built on previous inter-agency experiences and consisted of technically-informed, overarching recommendations.<sup>1,2</sup> The recommendations concerning core behaviours consisted of advising that Flu-WISE and Flu-CARE<sup>3</sup> procedures be followed, with the objective of reducing both transmission and mortality. These behaviours are designed to lessen the transmission of the virus and reduce its health impact.

Guidelines used included national guidance that already existed for seasonal influenza or other respiratory viruses. New national guidance was drafted as well and was used in conjunction with guidance from UNICEF-WHO and IFRC.<sup>4</sup>

## 2. Policy

Canada provided an example of policy difficulties. Because of its federal structure and separate provincial health responsibilities, consensus among the various provincial health departments and that of the national government was slow in coming. The wide variety of communities within the federation, with their cultural and historical diversity, required tailoring communications to specific locales.

The Canadian experience highlighted the importance of all stakeholders being involved in the planning, with regular meetings and workshops.

## 3. Interventions

In resource-limited countries, preparedness plans were not always finished by the time the pandemic struck, in part due to challenges in multi-sectoral and multi-level collaboration. Inadequate public health infrastructure hampered efforts considerably.

In many examples given, multi-sectoral task forces for coordination of interventions were set up, collaboration took place with external partners for support and risk communications and public outreach was implemented. The decision-making process included national and regional governments and non-governmental bodies such as companies and NGOs.

Measures addressing behavioural interventions to reduce transmission, including hand hygiene promotion and hand sanitizer installation, cough etiquette, staying at home with fever, social dis-

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<sup>1</sup> *Pandemic influenza preparedness and response. WHO guidance document.* Geneva, World Health Organization, 2009.

<sup>2</sup> *WHO and UNICEF. Behavioural interventions for reducing the transmission and impact of influenza A(H1N1) virus: A framework for communication strategies.* Geneva, World Health Organization, 2009.

<sup>3</sup> *WHO/UNICEF Informal discussion on behavioural interventions for the next influenza pandemic.* Bangkok, World Health Organization and UNICEF, 2006 ([http://www.unicef.org/avianflu/files/WHO\\_UNICEF\\_API\\_Mtg\\_Bangkok\\_Dec\\_06.pdf](http://www.unicef.org/avianflu/files/WHO_UNICEF_API_Mtg_Bangkok_Dec_06.pdf), accessed 23 November 2010).

<sup>4</sup> For example *Pandemic influenza counseling cards for health workers and volunteers: Learn about influenza.* Geneva, Humanitarian Pandemic Preparedness (H2P) Initiative, 2009 ([http://www.pandemicpreparedness.org/uploads/H1N1Eng\\_CueCards\\_6063.pdf](http://www.pandemicpreparedness.org/uploads/H1N1Eng_CueCards_6063.pdf), accessed 9 May 2011).

tancing, home disinfection, family care, disinfection of public places, home mask use, mask use in public, business closure and community infection control were implemented with inclusion of a rationale for all interventions. Infection control in the community involved making messages simple, specific and easy to implement.

Broadly speaking, there were two types of community-level communication interventions undertaken: mass media campaigns and fact sheets distributed to health care workers. The campaigns included a range of interventions from hand hygiene to pandemic vaccine use. Important issues concerning all communications included information-sharing among countries, the role of the media, the need to 'speak with one voice', the variety of intervention types and the importance of messages being delivered by prominent people in the community.

Some countries such as Canada emphasized personal responsibility in the prevention of disease, including measures for personal hygiene. The responsibility for measures on public transport was an issue in terms of personal or a public responsibility. It was noted that increased disinfection on public transport should be a focus of further research because transmission of disease on public transport could pose a major issue for cities.

#### **4. Risk communications**

Risk communication aims to promote a positive social response to pandemic interventions. It also aims to induce preventive action and appropriate behaviour change among populations.

The strategies utilized during the influenza pandemic 2009 included 'speaking with one voice', involving academic experts and government officials in the effort, and targeting core groups of at-risk populations. The activities were awareness campaigns, advocacy, call centres, on-line response capacities and multi-ministerial, NGO and private sector partnerships.

In the assessment of risk communication in the Republic of Korea it was found that it had been consistent, well-targeted and coordinated. There is still a need for specific guidelines and manuals and a need for care in naming the disease in order to avoid creating anxiety and panic. The formation of an on-line response team took more time than anticipated.

#### **5. Effectiveness**

The effectiveness of individual measures was hard to assess because it was difficult to determine what to measure even though some data were available and cross-sectional surveys of knowledge, attitudes and practices were undertaken. These data indicated that increased hand hygiene, cough etiquette and home care can work. In addition, consecutive hygiene campaigns have seen an increase in washing of hands, comfort with cough etiquette, the use of hand rubs in schools and the value of telephone advice. Overall, it was evident that the interventions resulted in some behaviour change. Having telephone advice available was also useful.

There is a need for studies to document the effectiveness of washing of hands in preventing influenza, or the possibility of measuring the effects and impact of hygiene promotion by looking at alternative indicators such as decreases in diseases transmitted from hand to mouth.

#### **6. Available evidence**

An e-survey was undertaken by UNICEF to review the utilization of the behavioural guidance and provide lessons learned to better inform planning for future public health emergencies where guidance is required by communication professionals.<sup>1</sup> The conclusions from this survey recognized that

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<sup>1</sup> Presented by Lopez-Macedo J. e-survey behavioural guidance H1N1, (18 March to 26 May 2010). UNICEF, New York. Gammarth, Tunisia, 2010

**CASE STUDY – REPUBLIC OF KOREA**

**THE REPUBLIC OF KOREA** implemented an intensive programme of behavioural interventions in response to the pandemic based on a broad partnership between multiple ministries, NGOs and the private sector.

The process for implementation proceeded using risk communications principles along with the provision of materials, equipment and consumables. The risk communications strategy targeted messages to different stakeholders including the general population, high risk groups, medical personnel, institution managers, provincial leaders and the mass media.

A Knowledge Attitude Behaviour Practice (KAP) study was implemented to evaluate the effectiveness of the communications strategy. It was found that washing of hands after using the toilet increased from 60% in 2008 to 75% post implementation in September 2009, and by December 2009 there was a positive perception of the benefits of washing of hands among 87% of the population surveyed.

Key lessons learned were the importance of mobilizing all members of the community in the response, and the need to initiate an early response and to establish a rapid support system for supplying human resources, equipment, and consumables such as soap and hand sanitizers. It is also important to check public awareness at regular intervals in order to monitor the progress in adopting personal risk reduction behaviours.

the guidance was both clear and useful. There is a need, however, for the guidance to be updated regularly in order to take account of emerging knowledge and there is also a need to re-examine dissemination strategies. It was also recognized that the guidance constituted a crucial input to other H1N1 recommendations.

In a literature review<sup>1</sup> concerning the use of face masks, 15 studies were selected for assessment from a total of 5351 papers reviewed. Most of the observational studies had to do with SARS rather than with influenza. In five hospital-based and two community-based studies, the use of a mask and/or respirator was found to be independently associated with reduced risk of having had clinically or laboratory diagnosed SARS. The methodological quality of these studies was deficient, however, due to controls that lacked microbiological diagnosis as well as opportunities for bias.

From this review, none of the studies established a conclusive relationship between mask/respirator use and protection against influenza infection.

The difficulty interpreting these observational studies and the lack of many published studies with outcomes involving microbiologically proven influenza puts into question the generalizability of SARS studies for guiding policy on influenza.

However, conducting well designed studies in this field is challenging and a 'new' seasonal influenza may behave differently from the preceding seasonal or pandemic influenza. Due to ethical considerations, it may be difficult to design studies employing a control group that does not use any protective equipment including masks/respirators given such precautions are routinely recommended for pandemic and seasonal influenza.

Given the study limitations, the difficulties in conducting studies, and the fact that there are differences between the diseases that have already been studied and new emerging diseases, it is not possible to make real-time evidence-based recommendations without a larger evidence base.

Some evidence suggests that mask use is best undertaken as part of a package or 'bundle' of personal protection measures. Early initiation and regular wearing of masks/respirators and hand hygiene

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<sup>1</sup> Work by Chamberland M, bin-Reza F, Nicoll A and Lopez V, presented by Nicoll A. The use of masks and respirators during an influenza pandemic: A review of scientific evidence. ECDC and SpR. Gammarth, Tunisia, 2010.

may improve their effectiveness in health-care and household settings. The effectiveness of masks and respirators is likely to be linked to consistent and correct usage but this is a major challenge both in the context of a formal study and in everyday practice.

A Knowledge, Attitude, Practice (KAP) survey on the H1N1 response in Lao PDR found that communication interventions raised awareness of correct preventive practices. However, this knowledge did not automatically lead to behaviour change or to dispelling misconceptions about the disease, its severity and effective treatments (myths about antibiotics and herbal remedies, for example). The survey also found that health professionals are generally trusted over other sources of information.

## 7. Lessons learned

To sustain community preparedness, a central coordinating body is needed to maintain dialogue and planning among partners. Public awareness efforts were stronger when they involved multiple persons and organizations having high credibility with communities and were aligned with a strategic implementation plan. District plans were often inadequate with deficiencies in coverage at the periphery.

It is important to coordinate all national capacities to respond at the societal level as a whole, to initiate an early response and to establish a field support system. An integrated, multi-hazard approach can help build institutional and individual capacity. It is also very important to ensure consistency and rapidity in risk communication. Lack of trust in governments was a problem, along with problems in the perception of disease risk. Ongoing advocacy is needed to maintain attention to the disease threat. There needs to be a rationale offered to accompany every recommendation explaining to people why they are being asked to change their behaviour. This would make the recommendations easier to implement.

The influenza A(H1N1)2009 pandemic reiterated that information, education and communication materials need to be adapted, tested and approved for local use ahead of time. There needs to be an appropriate 'translation' of global messages so that they are culturally appropriate and tailored to different audiences. The absence of standardized, pre-tested messages was a challenge. Media strategies should be proactive rather than reactive. Research is needed into the cost-effectiveness of communication using different communication channels.

Communication planning is important and stakeholders should be included in planning and implementation. Bringing people together provides an opportunity to identify each other's roles and capabilities, while the communication planning process promotes a sense of community ownership and leadership. Community participation ensures support for focused communications and relevant materials targeting specific population groups. Research into participatory action is desirable in order to have a better understanding of people's behaviour toward emerging infectious diseases.

The local context is extremely important; there is a need to know the community, its culture, social arrangements and its economic conditions. This is important to be able to explain why people should believe the authorities and why they should change their ways. Countries also need to be aware of communication campaigns going on in neighbouring countries because this can influence their own campaigns. This is especially true when borders are porous.

There is a need to identify dissemination channels that people trust. For example, in the European region people tend to trust physicians, family and friends and to some extent the media, while in the African region radio, women's groups, community door-knocking and the word of the village chief seem to be the most effective channels for getting messages across. Influential people need to be targeted and brought into play in the communications effort.

It is also necessary to identify the most appropriate messages as well as potential barriers to implementation. For instance, in the workplace, inadequate compensation might deter acceptance of staying at home when ill, lack of soap and clean water might inhibit the washing of hands, while 'social



distancing' as a message is sometimes considered too vague and is easily misunderstood. Messages targeting public services and transport are also important.

Messages and approaches should be integrated into existing frameworks, for example, basic hygiene messages should be embedded in all regular public health programs. Health and hygiene curricula in schools could include experience and guidance on influenza pandemic.

Communication needs to be strongest in areas where there is the most controversy, such as staying at home when ill and with regard to vaccination campaigns. The concept of 'staying at home when ill' was communicated but not well taken up by the public. To combat this, alternative strategies need to be considered for implementation. Such strategies might include educating employers' groups about the importance of empowering their employees to take time off when sick, etc.

## **8. Conclusions and next steps**

- It is advisable to create a framework for evaluating the effectiveness of the various measures and to make a greater effort to understand community issues.
- To enhance the sustainability and impact of the measures, linking behavioural interventions to those used in other existing programs and with other diseases is important. This linkage should be at country level and spread across all UN agencies.
- There is a need for a communication framework and associated tools to be used at the national level along with implementation capacities suited to each level.
- There is a general need to strengthen risk communication skills in key responding staff.

# Workshop Summary

The rapporteur presented a summary of the workshop before closing, reiterating the common themes which had emerged. One of the key themes was the need to consider the severity of the disease more fully in the decision-making process even though severity is not always known early in a pandemic and can be subject to change over time. Likewise, planning needs to include a range of scenarios based on different levels of severity as well as a more precise definition of triggers for starting and stopping the implementation of interventions. Countries need to focus on their own situations while staying informed of WHO recommendations, especially since interventions need to be applied taking specific national circumstances into consideration. This is especially true with respect to taking account of each country's particular position in the epidemiological cycle.

Inconsistencies in evaluating effectiveness and difficulties encountered in doing so, make available research somewhat inadequate in supporting decision-making. The absence of counterfactual analyses was noted by all participants as an important gap.

In response to this summation it was noted that WHO phases are linked to activities because Member State governments feel pressure to implement the recommended actions associated with each of the phases. Therefore a compelling evidence-based rationale for recommendations should be provided. With respect to evaluation, WHO should continue to give a range of options to Member States and provide scientific support and indicate under which circumstances each option should be implemented. It was also emphasized that countries themselves should do their own risk assessments. Furthermore, immediately available evidence will always be inadequate, requiring decisions to be made in a situation of some uncertainty.

It is important to recognize regional bodies such as the European Commission and Australian and South East Asian Nations and the support and guidance they provide to their Member States. It was suggested that WHO publish some of the large amount of evidence that will become available in the next six months because peer-reviewed journals will become less interested in publishing articles on H1N1 as time goes on. It is important especially to publish negative evaluations since those could orient preparations for the future.

An important question was whether the influenza A(H1N1)2009 pandemic was 'more different' than most other pandemics, given that all pandemics are different. It was noted that country experiences were extremely varied, with vast differences in implementation, decision-making processes, perceptions of policy-makers and the public, perceptions at both national and local levels and perceptions over time.

The discussion finished with the insight that Member States are very diverse, with additional diversities existing within countries which have different specific needs.

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## Next steps

There were multiple recommendations that came out of the discussions of each specific topic throughout the workshop. In addition, there were recommendations for the revision of the pandemic preparedness and response guidance. These include:

- For the revision of any guidance relating to pandemic influenza, there needs to be the elucidation of various scenarios based on severity to guide the approach to intervention implementation.
- There is a need for elucidating the triggers for commencement and cessation of measures.
- There is a need to develop a range of methodologies for evaluating the effectiveness of interventions.

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# Public Health Research Agenda for Influenza

Throughout the workshop there were recommendations for further research. These will be incorporated into the Public Health Research Agenda for Influenza which advocates and tracks research being conducted in the area. Specific topics for inclusion included:

- The investigation of transmission risk of respiratory disease, specifically influenza, in mass gatherings;
- The need for sound scientific analysis of the epidemiological and cost-effectiveness assessments of thermal screening at points of entry;
- The need to develop methodologies and to conduct exhaustive evaluations on the measures implemented to identify their effectiveness.

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# Annexes

Annex 1. Agenda

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Annex 2. List of Participants

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Annex 3. Declaration of Interests

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# Annex 1. Agenda

<b>Day 1. Tuesday, 26 October 2010</b>	
08:00–08:45	Registration
08:45–09:30	<b>Session 1: Welcome and opening remarks</b> <ul style="list-style-type: none"> <li>● Objectives of the meeting (Hande HARMANCI, WHO)</li> <li>● Introduction of participants</li> <li>● Review of declaration of interest</li> <li>● Adoption of agenda</li> <li>● Literature review methodology (Melody MILES)</li> </ul>
09:30–10:40	<b>Session 2: Reducing transmission of pandemic (H1N1) 2009 in mass gatherings</b> <ul style="list-style-type: none"> <li>● Overview of WHO guidance (Stephanie DAVIS, WHO)</li> <li>● Overview of literature review (Nicholas PHIN, HPA)</li> <li>● Country experiences (Serbia: Predrag KON, South Africa: Brett ARCHER)</li> </ul>
<b>10:40–11:10</b>	<b>Coffee break and group picture</b>
11:10–13:00	<b>Session 3: Issues related to international trade and travel during the influenza A(H1N1)2009 pandemic</b> <ul style="list-style-type: none"> <li>● Overview of WHO guidance and literature review (Gilles POUMEROL, WHO)</li> <li>● Overview of UNWTO's experiences (German PORRAS, UNWTO)</li> <li>● The international survey on public health measures taken at points of entry (Bettina GAU, Hamburg Port Health Centre)</li> <li>● Country experiences (China: Jianning ZHENG, Morocco: Abdelaziz BARKIA, India: Sita Ram AGRAWAL, Sujeet Kumar SINGH)</li> </ul>
<b>13:00–14:00</b>	<b>Lunch</b>
14:00–16:00	<b>Session 4: Group work on:</b> <ul style="list-style-type: none"> <li>● Introduction to the group work</li> <li>● Reducing transmission of pandemic A(H1N1)2009 in mass gatherings (Facilitator: Stephanie DAVIS / Nicholas PHIN)</li> <li>● Issues related to international trade and travel during the influenza A(H1N1)2009 pandemic (Facilitator: Gilles POUMEROL / Bettina GAU)</li> </ul>
<b>16:00–16:15</b>	<b>Coffee break</b>
16:15–17:05	<b>Session 5: Presentation of group work and discussions</b> <ul style="list-style-type: none"> <li>● Reducing transmission of pandemic A(H1N1)2009 in mass gatherings</li> </ul>
17:05–17:55	<ul style="list-style-type: none"> <li>● Issues related to international trade and travel during the influenza A(H1N1)2009 pandemic</li> </ul>
17:55–18:15	Assessment of the day
<b>18:30–19:30</b>	<b>Cocktail</b>



<b>Day 2. Wednesday, 27 October 2010</b>	
09:00–09:05	Review of agenda for the day
09:05–11:15	<p><b>Session 6: Reducing transmission of pandemic A(H1N1)2009 in school settings</b></p> <ul style="list-style-type: none"> <li>● Overview of WHO guidance (Hande HARMANCI, WHO)</li> <li>● Over view of literature review (Martin MUITA, WHO)</li> <li>● ECDC: Modelling and Schools Closures (Angus NICOLL, ECDC)</li> <li>● Country experiences (Japan: Tomimasa SUNAGAWA, USA: Isaac B. WEISFUSE, Thailand: Panithee THAMMAWIJAYA, Argentina: Horacio ECHENIQUE, Spain: Patricia SANTA OLALLA PERALTA)</li> </ul>
<b>11:15–11:30</b>	<b>Coffee break</b>
11:30–12:30	<b>Session 6 (continued)</b>
<b>12:30–13:30</b>	<b>Lunch</b>
13:30–16:00	<p><b>Session 7: Group work – Reducing transmission of pandemic A(H1N1)2009 in school settings</b></p> <ul style="list-style-type: none"> <li>● Introduction to the group work</li> <li>● Group work (Facilitator: Angus NICOLL / Walter HAAS / Katrin S. KOHL)</li> </ul>
<b>16:00–16:15</b>	<b>Coffee break</b>
16:15 –17:40	<b>Session 8: Presentation of group work and discussions</b>
17:40–18:00	Assessment of the day
<b>Day 3. Thursday, 28 October 2010</b>	
09:00–09:05	Review of agenda for the day
09:05–11:35	<p><b>Session 9: Behavioural interventions for reducing the transmission and impact of influenza A(H1N1) virus</b></p> <ul style="list-style-type: none"> <li>● Overview of WHO/UNICEF guidance (Jesus LOPEZ-MACEDO, UNICEF)</li> <li>● Overview of literature review (Martin MUITA, WHO / Angus NICOLL, ECDC)</li> <li>● Experiences with community-level interventions (IFRC: Vincent BRIAC-WARNON, AED: Cecilia M. LANTICAN)</li> <li>● Country experiences (Republic of Korea: J.W. KWON, Nepal: Shrestha ANAND KUMAR, Canada: Bonnie HENRY)</li> </ul>
<b>11:35–11:50</b>	<b>Coffee break</b>
11:50–13:00	<p><b>Session 10: Group work – Behavioural interventions for reducing the transmission and impact of influenza A(H1N1) virus</b></p> <ul style="list-style-type: none"> <li>● Introduction to the group work</li> <li>● Group work (Facilitator: Jesus LOPEZ-MACEDO / Allan BELL / Dee BENNETT )</li> </ul>
<b>13:00–14:00</b>	<b>Lunch</b>
14:00–15:30	<b>Group work: continued</b>
<b>15:30–15:45</b>	<b>Coffee break</b>
15:45–17:00	<b>Session 11: Presentation of group work and discussions</b>
17:00–18:00	<p><b>Session 12: Next steps and closure of the meeting</b></p> <ul style="list-style-type: none"> <li>● Report of the meeting summary (Rapporteur: Michael L. GORDY)</li> <li>● Next steps and discussion (Hande HARMANCI, WHO)</li> </ul>

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## Annex 2. List of Participants

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## Annex 3. Declaration of Interests

The workshop participants completed a WHO standard form for the declaration of interests. Before the workshop started, all participants were asked to confirm their interests and to provide any additional information relevant to the subject matter. In conformity with WHO procedures, the Secretariat reviewed and assessed the declarations by each participant.

The Secretariat concluded none of the participants had any significant conflict of interest with the subject matter of the workshop.

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