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## 8 Public health response: Non-pharmaceutical interventions during the Pandemic (Phase 6)

### 8.1 Introduction

This chapter provides advice on the non-pharmaceutical public health interventions to implement during Phase 6 of an influenza pandemic. It is recognised that there are difficulties in planning interventions in advance of knowing the characteristics of novel influenza strains, such as infectivity, clinical severity etc. As information on the epidemiology of influenza transmission, the effectiveness of non-pharmaceutical public health interventions and their costs are developed, the guidance will be updated. The purpose of this advice however, is to promote a consistent approach to population based measures to be taken at WHO Pandemic Phase 6 such as school closures and other social distancing measures, and also to measures aimed at individuals in the community to reduce their risk of infection.

The nature and duration of the interventions recommended by the Expert Group will depend on the severity of the pandemic. **The Expert Group advises that Ireland adopts the Pandemic Severity Index, a planning tool developed in the United States to characterise the severity of a pandemic, and that interventions are implemented according to the levels of severity experienced.**<sup>(1)</sup>

In deriving this guidance, the non-pharmaceutical public health interventions recommended by the World Health Organisation were reviewed, as well as the “ECDC Menu”.<sup>(2)</sup>

It is important to note that implementation of these recommendations, if adopted, will not only apply within the health services, but also across other government departments and services.

### 8.2 Aim of non-pharmaceutical interventions

The principal aims of non-pharmaceutical public health interventions are to:

- slow the spread of infection, thereby gaining some time to allow for development, production and administration of vaccine and antiviral agents against the pandemic strain
- decrease the epidemic peak
- reduce the total number of cases

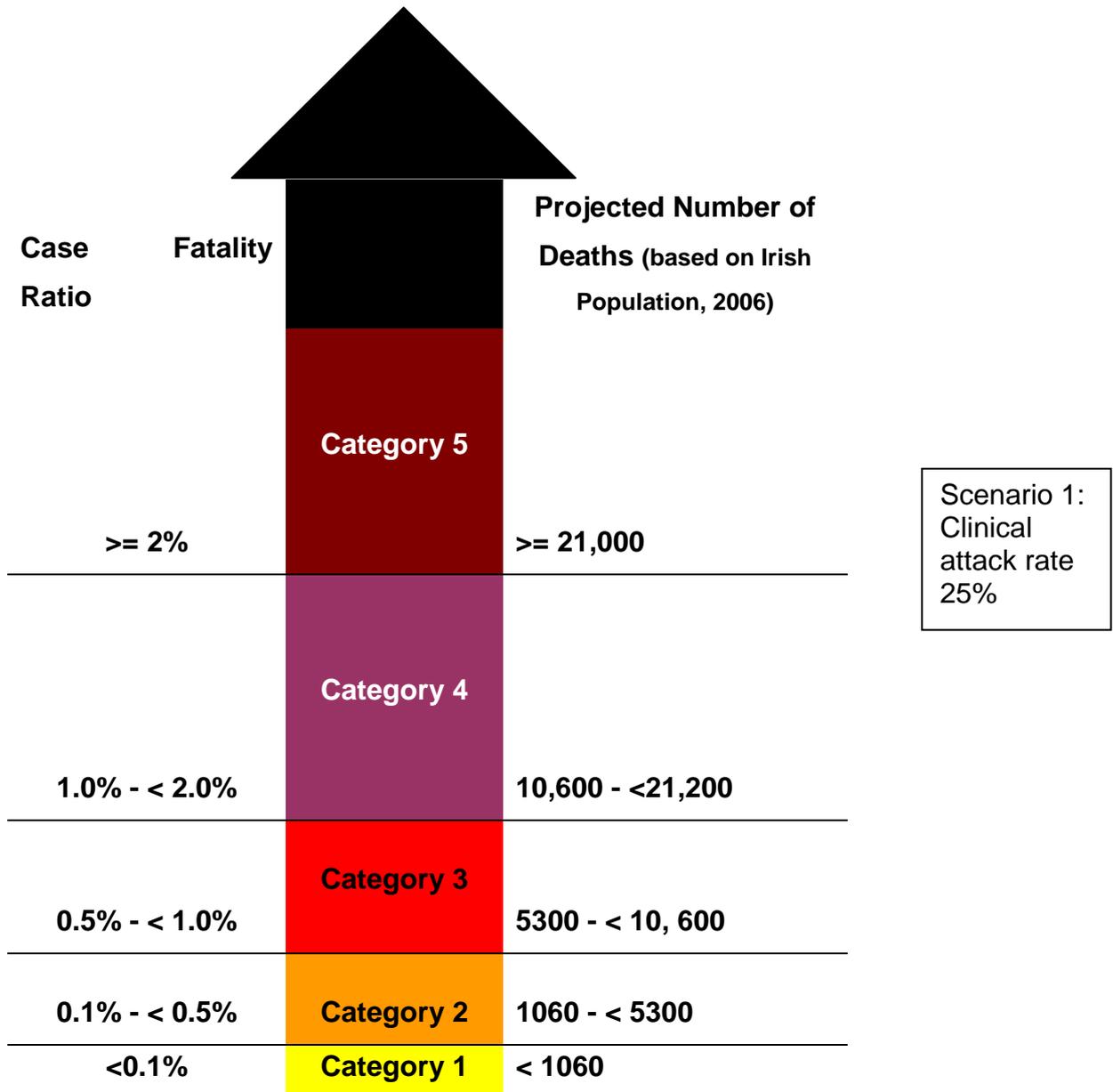
It is recognised that many of the interventions may have their greatest potential role during Phases 4 and 5 when there will be evidence of human-to-human transmission, with increasing adaptation to humans, but as yet the novel virus will not be fully transmissible. Their effectiveness during Phase 6 when human-to-human transmission is highly efficient may be less.

During a pandemic, it is also likely that interventions will not be undertaken in isolation, and that strategies will be adopted of using several pharmaceutical and non pharmaceutical public health interventions in combination, so called **defense in depth**, or **layering of measures**. Combining several partially effective interventions may have an overall greater effect than each one on its own.

### *8.2.1 The Pandemic Severity Index*

This index is designed to enable estimation of the severity of a pandemic on a population level. Pandemics are assigned to one of five discrete categories of increasing severity (Category 1 to Category 5). The category the pandemic is classified as largely determines the type of interventions to implement, and their duration of implementation. For category 4 or category 5 pandemics (Scenario 1), all available non pharmaceutical interventions are recommended and for up to 12 weeks duration. For category 2 and category 3 pandemics, social distancing measures should be implemented only if local crisis management teams determine that their use is warranted due to the characteristics of the pandemic in their community. If social distancing measures are to be used, then they should last for 4 weeks or less. For category 1 pandemics, voluntary home isolation of sick patients is the only community wide recommendation, though again local communities may

choose to apply some social distancing measures, if local epidemiology, surge capacity issues etc indicate that this would be beneficial.



Note: The Pandemic Severity Index is based on a clinical attack rate of 25%. If the clinical attack rate was higher, this would lead to more deaths in the population at a given case fatality ratio, and the index would need to be adjusted accordingly.

### 8.3 Triggers for initiating use of non-pharmaceutical interventions

Timing of initiation of these measures is difficult. Implementation needs to be early enough to prevent the initial steep upsurge in cases and long enough to cover the peak of the epidemic curve, whilst avoiding being so long as to be no longer feasible to maintain. The primary trigger for intervention is the

arrival and transmission of the pandemic virus. This is defined as a laboratory confirmed cluster of infection with a novel virus, and evidence of community transmission. It is recognised that defining what is meant by a community is not necessarily easy to do, given commuting patterns, and other non geographical links that exist.

## **8.4 Recommendations for non-pharmaceutical public health interventions**

### *8.4.1 WHO priority Public Health interventions*

The WHO undertook a broad ranging consultation exercise in 2004 on the public health interventions that could be used before and during an influenza pandemic, and from this <sup>(3)</sup> consultation process, it identified 12 possible non pharmaceutical interventions which could be used, and the stage(s) and circumstances during which it would be appropriate to use them. These measures were described in more detail in Chapter 7.

### *8.4.2 ECDC Menu*

ECDC published 3 documents in 2007 outlining a Menu of the public health measures that can be taken to reduce the impact of a pandemic during Phase 6.<sup>(2)</sup> These measures are grouped into personal actions (hand washing and mask wearing) and pharmaceutical interventions (antivirals, human avian influenza vaccines and late in the pandemic specific vaccines) as well as community social distancing measures. The ECDC document sets out the public health and scientific information on what is known or can be said about their likely effectiveness, costs (direct and indirect), their acceptability, public expectations and other practical considerations.

### *8.4.3 Irish guidance on use of non-pharmaceutical interventions at Phase 6*

The Irish guidance has been developed, taking into consideration both the WHO recommendations and ECDC menu. It also incorporates the US Pandemic Severity Index. The Expert Group considers that this tool helps planners to predict the impact, and to recommend interventions matched to the severity of the pandemic.

## **8.5 Measures at the national level**

### **8.5.1 Public Health information, communications**

There is good evidence that risk communication during outbreaks can affect outbreak control. In 2005, the WHO published evidence based field-tested communication guidance.<sup>(4)</sup> This guidance contains a short list of best practice for outbreak communication as follows:

#### **Trust**

The overriding goal for outbreak communication is to communicate with the public in ways that build, maintain or restore trust. This is true in every type of system.

#### **Announcing early**

Trust is established in the first official announcement of the outbreak. This message's timing, candour and comprehensiveness make it the most important of all communications.

#### **Transparency**

Maintaining the public's trust throughout an outbreak requires transparency. This means communication that is candid, easily understood, complete and factually accurate. Transparency allows the public to view the information gathering, risk assessing and decision making processes associated with outbreak control

#### **Talking with the public**

Understanding the public is critical to effective communication. It is usually difficult to change pre-existing beliefs unless those beliefs are explicitly addressed. It is nearly impossible to design successful messages that bridge the gap between the expert and the public without knowing what the public thinks

#### **Planning**

The decisions and actions of public health officials have more effect on trust and public risk perception than communication. In what you do, and what actions you take, you have a risk communication impact. Risk communication is therefore most effective when it is integrated with risk analysis and risk

management. Risk communication should be integrated into preparedness planning for major events and outbreak response.

**The Expert Group advises that the WHO outbreak communications approach be taken to all risk communication activities in relation to pandemic influenza in Phase 6.**

8.5.1.1 Information for the public and health professionals on risks and risk avoidance (tailored to target populations)

**The Expert Group advises that information should be available for the public and for health professionals on risks and risk avoidance during the pandemic.** This information should be tailored to different target populations and should include general information on the pandemic, its phases, and how to reduce the risk of infection.

8.5.1.2 Advice on universal hygiene behaviour

**The Expert Group advises that information on respiratory hygiene should be promoted, including public campaigns and respiratory hygiene in healthcare settings, during Phase 6.** This includes advising the public to cover the nose and mouth with a tissue when coughing or sneezing, and to dispose of tissues promptly in bins after use. Hand washing using soap and warm water is effective in reducing the risk of respiratory diseases, and should be encouraged. Alternatively alcohol based hand rubs can be used.

8.5.2 *Measures to reduce the risk of cases transmitting infection*

8.5.2.1 Confinement/isolation of cases

Voluntary confinement of ill patients to a single dedicated room for the duration of their symptoms reduces transmission by reducing contact between cases and uninfected persons. There is no published evidence on effectiveness available from trials, though it is supported in modelling studies by Ferguson.<sup>(5)</sup> There are practical implications in implementing this and consideration needs to be given to ensuring that support (social, physical and other) is available to patients and their caregivers. It is likely that compliance with a recommendation to voluntarily confine oneself if sick would be high.

**The Expert Group advises voluntary isolation of pandemic influenza cases when symptomatic.** For those who do not require hospitalisation this will usually be at home, but could be elsewhere if the circumstances at home are not suitable.

#### 8.5.2.2 Measures to reduce transmission of infection

Simple infection control advice can help reduce transmission of infection. This advice is:

- Cover nose and mouth with disposable single-use tissues when sneezing, coughing, wiping and blowing nose
- Dispose of used tissues in the nearest waste bin
- Wash hands after coughing, sneezing, using tissues, or contact with respiratory secretions and contaminated objects
- Keep hands away from the mucous membranes of the eyes and mouth
- If sick with flu, stay at home to avoid spreading infection to others

The advice aims to reduce transmission from person to person by indirect contact, and also to interrupt droplet transmission. Hand washing using soap and warm water is effective in reducing the risk of respiratory diseases, and should be encouraged. Alternatively alcohol based hand rubs can be used. Influenza viruses survive in the environment, and can pass from surfaces to the hands and cause infection. They can survive on tissues also, and cause infection. Tissues should be disposed of after use. Potentially contaminated surfaces should be cleaned using household disinfectants. Widespread environmental decontamination or air decontamination is not recommended. [Further guidance on infection control and disinfection can be found in the infection control supplement (Supplement 10)].

In many settings it is quite difficult to wash hands regularly and to increase hand washing would require considerable investment in schools and other settings. This might be the main limiting factor in implementing this recommendation. With regard to use of tissues, supplies are available, and it

is likely that this practical measure would be accepted and implemented by the community.

#### 8.5.2.3 Respiratory hygiene in healthcare facilities

A universal respiratory hygiene strategy is a series of measures designed to reduce transmission of infection in healthcare facilities. These are outlined in Appendix A. These measures are not specific to influenza, but will likely also reduce the incidence of other respiratory pathogens. They include the use of facemasks by symptomatic patients when waiting for assessment in waiting rooms. There is however no evidence from trials regarding the effectiveness of respiratory hygiene strategies. This intervention would probably be well accepted by the public.

**The Expert Group advises that infection control measures (hand washing and respiratory hygiene) are promoted for the public during the pandemic, and that a universal respiratory hygiene strategy should be adopted in all health care facilities.**

#### 8.5.2.4 Public use of facemasks

The aim of this intervention is the reduction of transmission in public places, the workplace and schools. There is very little evidence on the effect of use of facemasks in public (e.g. when in close contact with others on crowded public transport, cities etc) in preventing influenza transmission. There is some limited evidence of their effectiveness from two case-control studies carried out in Beijing and Hong Kong during SARS. In these studies, wearing masks in public was independently associated with protection from SARS in a multivariate analysis.<sup>(6;7)</sup> WHO has recommended that mask use by the public should be based on risk, including frequency of exposure and closeness of contact with potentially infectious persons. This could be interpreted as supporting mask use in crowded settings such as public transport. Although the unit cost is low, if used for the duration of the pandemic, the supply costs would be huge, and security of supply might be an issue. There would also need to be training in the proper use of masks

**The Expert Group advises that the evidence at this point does not support a recommendation for public use of facemasks during Phase 6 as a measure to prevent transmission of disease.**

### *8.5.3 Measures to reduce the risk that contacts of cases transmit infection*

#### 8.5.3.1 Contact tracing and quarantine

In the early stages of Phase 6, efficient human-to-human transmission of the pandemic strain of influenza may not yet have been established in Ireland. In this context, there is merit in aggressively tracing initial contacts and isolating and treating them with antiviral drugs if available in order to prevent wider spread. The potential difficulties with successful contact tracing include the short incubation period, being infectious for 24 hours prior to onset of symptoms, and a high rate of asymptomatic illness, leading to a limited ability to identify all contacts in the time required.

**The Expert Group advises that initial cases occurring during the pandemic should be interviewed in depth and all contacts should be identified, contact traced and asked to go into voluntary home quarantine by the local Department of Public Health.**

If this measure were continued during the pandemic, modelling studies suggest that it would result in significant numbers of people being quarantined, on several occasions during the pandemic. This would have huge costs and adverse effects in the wider economy. Once efficient transmission has been demonstrated in Ireland, consideration should be given to continuing voluntary home quarantine, and other social distancing measures, where feasible, particularly in a category 4 or 5 pandemic.

### *8.5.4 Measures to increase social distance*

#### 8.5.4.1 Closure of educational facilities

The aim of this intervention is to reduce spread in those settings where transmission is occurring. Despite the propensity of influenza epidemics to be amplified in primary schools, data on the effectiveness of school closures are

limited.<sup>(8)</sup> The knowledge base in this area consists primarily of historical and contemporary observations and modelling studies, rather than controlled studies of evaluation interventions. A recent review article on non-pharmaceutical interventions for pandemic influenza by a WHO Writing Group concluded that no data or analyses exist for recommending illness thresholds or rates of change that should lead to considering closing or reopening schools.<sup>(9)</sup>

Some quantitative evidence is available from Israel where a recent retrospective cohort study of 186,094 children aged 6-12 years was undertaken during a flu outbreak. As a result of a national strike, elementary schools closed for a period of two weeks. Children were cared for mainly at home. There were significant reductions in visits to the doctor, and in diagnoses of respiratory tract infections during the strike. School closure was temporally associated with decreased morbidity from respiratory infections.<sup>(10)</sup>

**The Expert Group advises that all schools should have ready access to information on influenza, and how to reduce the risk of infection.** This information should also be available in the workplace and other settings where groups of people spend time together and use communal facilities.

All schools and day care institutions should have a plan for how they could close in an emergency. This plan should have input and involvement of teachers, parents and carers.

The Pandemic Severity Index will be used when considering implementing school closure. **For Category 4 and 5 pandemics, the Expert Group advises that school/college/educational institution closure should be strongly considered on a national basis.** For category 2 and 3 pandemics, decisions to implement school closures locally may be made taking the following factors into consideration:

- Epidemiology of cases: age groups affected, where infected, attack rate by age group, by institution, time since index case first identified, number of transmission cycles, severity of cases etc.
- Evidence of recent transmission occurring in a school or institution, and there is otherwise no widespread transmission in the community.
- The morbidity and mortality among children
- Urban versus rural school. In a rural setting, it could be the main mode of transmission, but less likely to be in urban settings
- The potential consequences to the workforce of closing schools, as working parents might need to take time off work to care for their children

For category 1 pandemics, school closure is not recommended.

If a decision is taken to close a school, then ideally, criteria for reopening the school should as far as is possible be agreed in advance.

#### 8.5.4.2 Population-wide measures to reduce mixing of adults

**The Expert Group advises that population-wide measures to reduce mixing of adults (close workplaces, initiate leave of absence for non essential workers, discourage mass gatherings) should be strongly considered on a national basis for category 4 and 5 pandemics.** In addition, other political and economic considerations will influence these decisions. For category 2 and 3 pandemics, decisions may be taken on a local level if local characteristics of the pandemic determine that their use is warranted. For category 1 pandemics, these interventions are not recommended.

*Mass gatherings are settings or situations where there is the potential for transmission of infection to many persons, and where it may be possible to delay or slow the spread of infection if they are restricted.*

Mass gatherings may provide opportunities for transmission and dissemination of influenza, and may leave patients sick, when away from home. Cancellation of all events would however be very costly. The

discouragement or banning of mass gatherings is under consideration and may be reviewed following guidance from the World Health Organisation, and others.

#### *8.5.5 Measures to decrease the interval between symptom onset and patient isolation*

##### 8.5.5.1 Public campaign to encourage prompt self-diagnosis

**The Expert Group advises that the public should be informed of the symptoms of influenza, how to recognise if they might have it, and advised of practical issues such as the value of having a thermometer at home.**

##### 8.5.5.2 Public advice and medical help lines

**The Expert Group advises that a national medical helpline should be established to deal with individual queries or concerns, and to direct those with symptoms to the appropriate location for care and treatment.**

This helpline will be resource intensive, as was seen during the SARS outbreak in Toronto.<sup>(11)</sup> However its implementation will be critically important to reducing the burden on primary care and will reduce face to face contacts.

#### *8.5.6 Measures for persons entering or exiting an affected area in Ireland during Phase 6*

It is anticipated that during pandemic Phase 6 most persons will voluntarily restrict travel to and from affected areas. Enforcement of travel restrictions is considered impractical, as is the imposition of a cordon sanitaire around affected areas. For public health purposes, disinfection of clothing, shoes or other objects of persons exiting an affected area is not recommended.

#### *8.5.7 Measures at the international level*

In a recent WHO review of international non-pharmaceutical public health interventions, it concluded, based on experience from past influenza pandemics, that screening and quarantine of entering travellers at international borders did not substantially delay introduction of pandemic influenza, except in some island countries.<sup>(12)</sup> In addition it also stated that

similar policies, even if they could be implemented in time and regardless of expense, are unlikely to be more effective given extensive international air travel. **WHO does not recommend at any Phase that individual countries be quarantined or that international borders be closed.**<sup>(13)</sup> This is further supported by Ferguson's modelling work which showed that border restrictions and/or internal travel restrictions were unlikely to delay spread by more than 2 to three weeks unless more than 99% effective.<sup>(5)</sup>

#### 8.5.7.1 Travel Advice

**The Expert Group advises that during the pandemic, travellers should be advised to defer non-essential international travel to affected areas.**

#### 8.5.8 *Measures at borders for international travellers coming from or going to affected areas*

**The Expert Group advises:**

- 1. Health Alert Notices should be provided to all travellers to and from affected areas**
- 2. Travellers to and from affected areas should be advised to check themselves for fever and to self-report if they have illness.**
- 3. Exit screening for at-risk travellers – identified via health questionnaires or declaration notices - should be implemented**
- 4. All intending travellers who are ill should be recommended to postpone travel**

Entry screening such as screening for symptoms (visual detection of symptoms), health screening questionnaires, thermal screening, and medical examination should not be necessary. There is a lack of proven health benefit with these measures. However, if there is evidence that exit screening at the point of embarkation does not meet the standards expected, entry screening may be considered, following consultation with WHO and EU colleagues.

#### 8.5.9 *Measures for travellers on board international conveyances from affected areas*

The Expert Group advises the following measures for during phase 6:

1. Travellers should be asked to self-report flu like illness, and sick travellers should be separated on board, if possible.
2. The public health authorities in the destination and transit countries should be informed that there is an ill person on board

### **8.6 Public Health Surge capacity**

Non-pharmaceutical public health interventions may be the only tools available to slow spread of a pandemic virus in advance of sufficient quantities of antivirals and pandemic strain vaccine becoming available.

**The Expert Group considers it is crucial that consideration is given to the significant human resource implications of implementing these recommendations and that manpower planning for pandemic influenza also includes planning for a robust public health infrastructure and sufficient surge capacity for public health.**

	Category 1	Category 2	Category 3	Category 4	Category 5
<b>Measures at the national level</b>					
<b>Public health information, communications</b>					
Information for the public and health professionals	Recommend	Recommend	Recommend	Recommend	Recommend
Advice on universal hygiene behaviour	Recommend	Recommend	Recommend	Recommend	Recommend
<b>Measures to reduce the risk of cases transmitting infection</b>					
Confinement/isolation of cases	Recommend	Recommend	Recommend	Recommend	Recommend
<b>Measures to reduce transmission of infection</b>					
Measures for the public	Recommend	Recommend	Recommend	Recommend	Recommend
Respiratory hygiene in healthcare facilities	Recommend	Recommend	Recommend	Recommend	Recommend
<b>Measures to reduce the risk that contacts of cases transmit infection</b>					
Contact tracing and quarantine of early cases	Recommend	Recommend	Recommend	Recommend	Recommend
Quarantine of contacts during the pandemic	Generally not recommended	Generally not recommended	Generally not recommended	Consider	Consider
<b>Measures to increase social distance</b>					
Closure of educational facilities	Generally not recommended	Consider <= 4 weeks	Consider <= 4 weeks	Recommend	Recommend
Population wide measures to reduce mixing of adults	Generally not recommended	Consider <= 4 weeks	Consider <= 4 weeks	Recommend	Recommend
<b>Measures to decrease the interval between symptom onset and patient isolation</b>					
Public campaigns to encourage prompt self diagnosis	Recommend	Recommend	Recommend	Recommend	Recommend
Public advice and medical helplines	Recommend	Recommend	Recommend	Recommend	Recommend
<b>Measures for persons entering or exiting an affected area in Ireland</b>					
<b>Measures at the international level</b>					
<b>Travel advice</b>					
Advice to defer non essential international travel to affected areas	Recommend	Recommend	Recommend	Recommend	Recommend
<b>Measures at borders for international travellers coming from or going to affected areas</b>					
Health alert notices for all travellers to and from an affected area	Consider	Recommend	Recommend	Recommend	Recommend
Travellers to and from an affected areas should be advised to check themselves for fever and to self report if they have illness	Consider			Recommend	Recommend
Exit screening for at risk travellers - identified via HAN or declaration notices - should be implemented	Consider			Recommend	Recommend
All intending travellers who are ill should be advised to postpone travel	Recommend	Recommend	Recommend	Recommend	Recommend
<b>Measures for travellers on board international conveyances from affected areas</b>					
Travellers should be asked to report illness, and separated on the plane	Recommend	Recommend	Recommend	Recommend	Recommend
PH authorities to be informed of ill person(s) on board	Recommend	Recommend	Recommend	Recommend	Recommend

## 8.7 Reference List

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## **Appendices**

### **8.8 Appendix A Universal Respiratory Hygiene**

The following are components of a universal respiratory hygiene strategy to be adopted in all health care facilities.

- The posting of visual alerts at the entrances to all healthcare facilities, instructing patients and those who accompany them to:
  - Inform healthcare personnel of symptoms of a respiratory infection when they first register for care
  - Practice respiratory hygiene
  - Advise visitors with respiratory symptoms to defer their visit until symptoms have resolved
- All patients and visitors who have symptoms of an infectious respiratory illness (cough, runny nose, sore throat or sneezing) should be provided with a surgical mask and instructions on their proper use and disposal. They should also be provided with instructions on hand-hygiene.
- For those who cannot wear a mask, provide tissues and instructions on when to use them (i.e. when coughing, sneezing, or controlling nasal secretions), where they should be disposed of, and on the importance of hand-hygiene after using them.
- Waste bins should be readily available for disposal of tissues.
- Provide hand-hygiene materials in the waiting room areas and encourage persons with respiratory symptoms to perform hand-hygiene.
- Instruct registration, reception and triage staff of their risk of exposure to infections spread by droplets and to consider wearing masks whenever registering or assessing patients who have respiratory symptoms and are not wearing a mask. Instruct them to remain at least 3 feet from unmasked patients.
- Consider the use of Plexiglas barriers at the point of triage or registration to protect healthcare personnel from contact with respiratory droplets.

- Where possible, designate an area, cubicle or separate room in waiting areas where patients with respiratory symptoms can be segregated (ideally by at least 3 feet) from others without respiratory symptoms.
- Commonly used surfaces such as door handles, handrails, table surfaces etc. should be cleaned twice daily with disinfectant.
- Use droplet precautions to manage patients with respiratory symptoms until it is determined that the cause of the symptoms is not an infectious agent that requires more than standard precautions.