

Pandemic influenza preparedness and mitigation in refugee and displaced populations

WHO guidelines for humanitarian agencies

Second edition

Geneva, 2008

DISEASE CONTROL IN HUMANITARIAN EMERGENCIES

EPIDEMIC AND PANDEMIC ALERT AND RESPONSE



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These guidelines may need to be updated in 18 months–2 years as the epidemiological information evolves or as new information emerges.

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1. RATIONALE

An influenza pandemic occurs when a novel influenza virus appears against which the human population has limited or no immunity, and which transmits efficiently from person to person, resulting in several simultaneous epidemics worldwide with the potential for considerable morbidity and mortality. With the increase in global transport and communications, as well as in urbanization and overcrowded conditions, epidemics caused by the new influenza virus are likely to quickly take hold around the world. The impact of a novel pandemic influenza virus on refugee and displaced populations is expected to be severe. Risk factors for increased morbidity and mortality from pandemic influenza in these populations include:

- overcrowding, particularly in camp settings;
- poor access to basic health-care services that will be accentuated by a pandemic;
- limited or no access to hospitals for supportive care and treatment of complications;
- high prevalence of malnutrition;
- high incidence/prevalence of other communicable diseases, e.g. acute respiratory illnesses, malaria, diarrhoeal diseases;
- logistic challenges resulting from often remote locations or ongoing active conflict;
- lack of adequate surveillance/early warning systems to detect cases or clusters;
- poor links to national disease surveillance systems;
- possible exclusion from national influenza preparedness and response activities;
- lack of trained and equipped staff to investigate outbreaks and manage ill persons.

While WHO and the United Nations (UN) have encouraged each country to create a national pandemic preparedness plan (PPP), these national plans, developed by government ministries including health and agriculture, may not take sufficiently into account refugee and displaced populations. This is particularly of concern in countries where health-care programmes for these populations are implemented by humanitarian agencies, often coordinated by UN organizations. This gap could leave these populations more vulnerable to the impact of a pandemic.

Target audience

These practical field-based guidelines are intended for use by humanitarian agencies, e.g. nongovernmental organizations (NGOs), UN organizations coordinating these services, and donor agencies providing financial support for the populations concerned. They also target ministry of health staff working with refugee and displaced populations at local and national levels. They are intended not only for camp settings but also for open settings with displaced populations living dispersed among local communities.

WHO recommends that each agency develop a locally-relevant PPP that specifically addresses the current capacity and anticipated needs on the ground. Where possible these targeted PPPs should be linked to existing national ones. A targeted PPP should enable a systematic sequence of actions in preparation for and response to a pandemic. Where there is no national PPP in place, the organization should work closely with the relevant authorities to formulate practical strategies for addressing the threat of pandemic influenza.

Structure of the document

This document provides background information on pandemic influenza, describes WHO pandemic phases and strategies to deal with a pandemic according to phase, and outlines preparedness activities needed during the prepandemic period. The remainder of the document focuses on response during an influenza pandemic to mitigate its effects.

Key principles

1. Although influenza pandemics are recurring and well-documented phenomena, it is not possible to predict either the onset of the next pandemic or its specific viral cause.
2. Pandemic preparedness efforts, though targeting a future event, can strengthen public health systems and improve health-care worker safety now.
3. Known public health measures taken by individuals and communities, such as social distancing, respiratory etiquette, hand hygiene, and household ventilation, are currently the most feasible measures available to reduce or delay disease (morbidity) and death (mortality) caused by pandemic influenza.
4. Pandemic preparedness efforts should complement and reinforce other disease programmes and not divert existing health-care resources from humanitarian programmes.
5. The primary goal of pandemic preparedness is to mitigate the local impact of a pandemic.
6. Containment of an emerging pandemic strain, once detected, is a separate activity that will be coordinated by WHO and implemented through and with national governments.
7. A system of triage and prioritization should be in place for each health-care setting to maximize impact and to focus efforts on the most effective interventions in the event of a pandemic.

2. Background

2.1 How a novel influenza virus could cause a pandemic

2.1.1 Avian influenza infections in birds

Avian influenza, or “bird flu”, is a contagious disease of animals caused by viruses that normally infect only birds and usually grow in their gastrointestinal tracts. In domestic poultry, infection with avian influenza viruses causes two main forms of disease, distinguished by low and high levels of virulence. The so-called “low pathogenic” form commonly causes only mild symptoms and may easily go undetected. The highly pathogenic form spreads rapidly through poultry flocks, causes disease affecting multiple internal organs and has a mortality rate that may approach 100%, often within 48 hours. These viruses are transmitted between birds through their respiratory droplets or through their faeces.

2.1.2 Avian influenza infections in humans

Avian influenza viruses have on rare occasions infected other species, e.g. humans. This is known as crossing the species barrier. When this occurs, severe human disease may result owing to lack of immunity to the novel virus. The more there is close contact between birds and humans, the higher the chance that this novel avian influenza virus will jump from birds to infect humans. Avian influenza caused by highly pathogenic A(H5N1) virus in humans is a rare but severe disease that must be closely watched and studied because of the potential of the virus to evolve in ways that might start a pandemic.

2.1.3 Pandemic influenza

A pandemic is a worldwide epidemic caused by a novel virus that affects most or all age groups within a period of months. It may be viewed as hundreds of large epidemics occurring in many different countries at the same time. A pandemic may occur if three conditions are met:

- a new influenza virus emerges (such as avian influenza H5N1);
- the virus infects humans (this has occurred with H5N1, although it is still relatively rare);
- the virus spreads efficiently and in a sustained manner from human to human.

When these prerequisites are present, the virus has become a human influenza virus, and humans will no longer require contact with birds to be infected. The disease may spread widely and rapidly around the world as humans have no immunity against the new virus. It is an influenza pandemic.

2.1.4 Seasonal human influenza

As more and more people are exposed to a pandemic virus, population immunity develops and there are fewer new cases. This pandemic virus, now a human influenza virus, does not disappear entirely; rather, it undergoes small changes in its surface proteins (antigenic drift) that enable it to evade the immunity that humans may have developed after previous infections with such viruses, or in response to vaccinations, and thus seasonal influenza outbreaks may occur. Seasonal human influenza affects 1 in 5 people and is responsible for an estimated 250 000 deaths every year.

2.2 Epidemiology of human influenza viruses

Transmission

Understanding the transmission of human influenza viruses is crucial to understanding recommended control measures.

- The transmission of human influenza viruses is thought to occur largely through exposure to respiratory droplets at distances of less than 1–2 m, through direct inhalation. Large-particle ($> 5 \mu\text{m}$) respiratory droplet transmission is common among close contacts (within 1 m) and likely to account for the majority of transmission. Large-particle respiratory droplets travel only short distances (usually 1 m or less) and do not remain suspended in the air, and thus require close contact between the source (a sick person who coughs or sneezes) and the recipient (a well person who inhales the respiratory droplets).
- Infection through large-particle respiratory droplets landing directly onto conjunctiva may also be possible, but is likely to be less important than direct inhalation of these droplets.
- The transmission of influenza viruses through small-particle aerosols ($< 5 \mu\text{m}$) may also occur over short distances (1 m or less). However, in both cases (large-particle droplets and small-particle aerosols), long-distance transmission (at distances over 1–2 m) has not been clearly demonstrated.
- Small-particle (aerosol) transmission of influenza at several metres, where respiratory particles may be suspended as small particles in the air, might occur with special medical procedures such as endotracheal intubation, nebulizer treatment, suctioning, or surgery and autopsy where high-speed devices (such as drills/saws) are used.
- Self-contamination after touching an influenza virus-contaminated object or surface through hand-to-nose, hand-to-eye or hand-to-mouth transmission may also occur, but it is likely to be less important than inhalation of large-particle respiratory droplets.

Close contact with a case is defined as:

- intimate contact (within 1 m)
- providing care
- living in the same household
- direct contact with respiratory secretions (saliva droplets of a suspected case, coughing or sneezing), body fluids and/or excretions (e.g. faeces).

Incubation period:

- the incubation period for seasonal human influenza is around 2 days and ranges from 1–4 days
- the incubation period for a novel pandemic virus is as yet unknown
- current data for H5N1 avian influenza infection in humans indicate an incubation period ranging from 2 to 5 days and possibly as long as 8 days.

Infectious period:

- in adults, the infectious period of seasonal human influenza is approximately up to 5 days from the onset of illness in adults
- the infectious period in children may be 10 days or more
- the duration of viral replication, and hence possible infectiousness, is longer with A(H5N1) and perhaps other novel virus infections, and may extend up to 2–3 weeks
- a small proportion of patients may be infectious just before symptoms appear.

Attack rates:

- available data from previous pandemics and from seasonal human influenza studies suggest an attack rate of 15–35%
- this may be higher in densely populated sites, for example up to 50–60%, as crowding may facilitate the transmission of influenza viruses.

Hospitalization rates:

- estimates from the more severe past pandemics suggest rates of severe illness (requiring hospitalization) of 1–2% of those who fall ill
- it is hypothesized that hospitalization rates during a future pandemic may reach up to 10% in vulnerable populations and poorly-resourced settings.

Case-fatality rates:

- estimates from the more severe past pandemics suggest that a case-fatality rate of 1–2% of those who fall ill may occur
- this may reach up to 4% or more in poorly-resourced settings in a future pandemic.

Rate of secondary bacterial infection:

- to date, pneumonias occurring in humans infected with avian influenza H5N1 have been primarily viral. However, data from military training camps during the 1918 pandemic indicated that 50 % of all pneumonias were bacterial.
- the potential effect of malnutrition and coinfection with other pathogens (HIV, malaria, etc.) on the clinical picture is unclear. WHO will update the clinical epidemiology as it becomes available.
- it is estimated that 5–10% of all pandemic influenza patients will develop pneumonia; this may be higher in vulnerable populations. In this document, it is hypothesized that 10–20% of all pandemic influenza patients will develop pneumonia, of which 50% will be secondary bacterial pneumonia (thus 5–10% of those who fall ill are estimated to develop secondary bacterial pneumonia).
- See Table 1 for a summary of estimates of epidemiological indicators for a future pandemic.

Cleaning and disinfection:

- seasonal human influenza viruses are readily inactivated by alcohol and by chlorine, soap and water, and a variety of disinfectants
- cleaning of environmental surfaces with soap and water may reduce contact transmission (touching the contaminated surface then touching the mouth or nose).

Table 1: Epidemiological indicators for pandemic influenza

Indicators	Estimates from past pandemics	Estimates for crowded, low-resource settings
Attack rate	15–35% (of the general population)	Up to 50–60%
Secondary bacterial pneumonia	2.5–5% (of those ill)	5–10%
Health-care seeking - outpatients	30–50% (of those ill)	30–50%
Hospitalization rate - inpatients	1–2% (of those ill)	Up to 10%
Case-fatality rate	1–2% (of those ill)	4% or more

2.3 Consequences of an influenza pandemic

In the past, new strains have generated pandemics causing high death rates and a great deal of social disruption. In the 20th century, the greatest influenza pandemic occurred in 1918–1919 and caused an estimated 40–50 million deaths worldwide. Overcrowding, malnutrition and poor access to health-care services in some settings are likely to lead to higher morbidity and mortality rates among refugee and displaced populations.

Preparedness plans should anticipate and address the following scenarios. If an influenza pandemic occurs:

- Once a fully contagious virus emerges, its global spread is considered inevitable. The pandemics of the previous century encircled the globe in 6–9 months. Given the speed and volume of international air travel today, the virus could spread more rapidly, possibly reaching all continents in less than 3 months.
- Successive waves: the pandemic is likely to return to a region in 2–3 waves, for example for 2–3 months each year over 2–3 years.
- Because most people will have no immunity to the pandemic virus, widespread illness will result.
- Health facilities are likely to be overwhelmed, not only by large numbers of people who suddenly fall ill but also by the "worried well" who seek health care.
- The number of deaths will be determined by how many people become infected, the virulence of the virus, the underlying characteristics and vulnerability of affected populations, the effectiveness of preventive measures and the speed with which they are put into place, as well as the quality of health care. Caring for the sick will become critical. Deaths will occur not only from influenza but also from other usual causes of mortality in the area, and therefore

care for other major causes of morbidity and mortality should also be planned for and provided during a pandemic.

- Economic and social disruption may occur depending on the severity of the pandemic.
- Absenteeism due to illness will increase social disruption.
- Essential services such as health care, food supply, safe water, sanitation, power, transportation, communications and security/protection services may be disrupted to varying degrees depending on the rates of absenteeism and whether contingency plans have already been developed and are rapidly implemented.
- The effect of influenza on individual communities will be relatively prolonged when compared with other outbreaks, as it is expected that outbreaks will reoccur. Past pandemics have spread globally in two and sometimes three waves; in the 1918–1919 pandemic, the second wave was more severe in terms of mortality. Not all parts of the world or of a single country are expected to be severely affected at the same time.
- A pandemic may affect local and regional security because of the economic impact and depletion of local water and food supplies. Refugees and internally displaced persons (IDPs) will need to be protected in the event of insecurity. Local communities should be included in preparedness activities to minimize disparities with refugees/IDPs.

Table 2 provides an estimate of the number of persons likely to be affected by pandemic influenza in a given population of 10 000, in a crowded, low-resource setting. Note that this does not estimate incidence for other causes of illness during the pandemic. Other causes of morbidity and mortality such as malaria, diarrhoeal diseases, TB, HIV/AIDs, etc. will continue to represent a burden for health-care services during this period.

Table 2: Estimated number of persons affected by pandemic influenza in a population of 10 000 in a crowded, low-resource setting

Description	Estimated rates	Number of persons affected over a 2–3 month pandemic wave	Number of persons affected per day
Ill from influenza	Up to 50–60% (of the general population)	Up to 5000–6000	56–100
Secondary bacterial pneumonia (needing antibiotics)	5–10% (of those ill)	250–600	3–10
Health-care seeking for influenza (outpatients)	30–50% (of those ill)	1500–3000	17–50
Severe cases of influenza needing hospitalization (inpatients)	Up to 10% (of those ill)	500–600	6–10
Deaths from influenza (includes community and health facilities)	4% or more (of those ill)	200–240	2–4 or more

3. WHO phases for pandemic influenza

WHO phases are designed as a system for informing the world of the seriousness of the threat of pandemic influenza and to facilitate pandemic planning.

Table 3: WHO phases for pandemic influenza

Inter-pandemic phase - New virus in animals, no human cases	Low risk of human cases	1
	Higher risk of human cases	2
Pandemic alert - New virus causes human cases	No, or very limited, human-to-human transmission	3
	Evidence of increased human-to-human transmission	4
	Evidence of significant human-to-human transmission	5
Pandemic	Efficient and sustained human-to-human transmission	6

Table 4: WHO pandemic phases and planning goals

PHASES	PUBLIC HEALTH GOALS
Inter-pandemic phase	
<i>Phase 1</i> No new influenza virus subtypes have been detected in humans. An influenza virus subtype that has caused infection may be present in animals. If present in animals, the risk of human infection or disease is considered to be low	Strengthen influenza pandemic preparedness at the global, regional, national, subnational and local levels.
<i>Phase 2</i> No new influenza virus subtypes have been detected in humans. However, a circulating animal influenza virus subtype poses a substantial risk of human disease.	Minimize the risk of transmission to humans; detect and report such transmission rapidly if it occurs.

Pandemic alert	
<p><i>Phase 3</i></p> <p>Human infection(s) with a new subtype, but no human-to-human spread, or at most rare instances of spread to a close contact.</p>	<p>Ensure rapid characterization of the new virus subtype and early detection, notification and response to additional cases.</p>
<p><i>Phase 4</i></p> <p>Small cluster(s) with limited human-to-human transmission but spread is highly localized, suggesting that the virus is not well adapted to humans.</p>	<p>Contain the new virus within limited foci or delay spread to gain time to implement preparedness measures, including vaccine development.</p>
<p><i>Phase 5</i></p> <p>Larger cluster(s) but human-to human spread still localized, suggesting that the virus is becoming increasingly better adapted to humans, but may not yet be fully transmissible (substantial pandemic risk).</p>	<p>Maximize efforts to contain or delay spread, to possibly avert a pandemic and to gain time to implement pandemic response measures.</p>
Pandemic	
<p><i>Phase 6</i></p> <p>Pandemic: increased and sustained transmission in the general population.</p>	<p>Minimize the impact of the pandemic.</p>

4. Pandemic preparedness and mitigation: the role of humanitarian agencies

WHO currently promotes five key strategic actions to address pandemic influenza that are underpinned by the themes prevention, preparedness, early detection, response:

1. *Reduce human exposure to H5N1*

Humanitarian agencies should aim to reduce human exposure to avian influenza A(H5N1) by informing communities of risks of exposure to sick or dead animals (particularly poultry/birds) and risk avoidance.

Agencies should support such efforts through integration of these activities into other field programmes dealing with agriculture, livelihood activities, food security, water and sanitation.

2. *Strengthen the early warning system*

Humanitarian agencies should facilitate the early detection, notification and early response to the initial suspected cases/clusters in humans of a novel pandemic influenza virus with reporting to relevant authorities and WHO.

3. *Intensify rapid containment operations*

Humanitarian agencies should facilitate rapid containment operations under coordination of the ministry of health and WHO in the event of sustained human-to-human transmission of a novel pandemic influenza virus.

4. *Build capacity to cope with a pandemic*

Once a pandemic has started, the most important task will be to mitigate its effects. Therefore, the main focus of pandemic preparedness efforts should be directed towards this objective. Preparedness planning to build capacity to cope with an influenza pandemic aims to:

- minimize the impact of pandemic influenza by implementing public health measures that reduce morbidity (measures decreasing transmission) and mortality (case management);
- implement previously-developed communication plans, health education messages and social mobilization activities to improve compliance with recommended public health measures;
- minimize shortages of essential services such as health care (including for usual burden of disease), access to food, safe water, sanitation, power, communications and security/protection;
- minimize social disruption;
- prioritize countries in the UN consolidated appeals process (CAP) list of countries as these populations will be the most vulnerable in the event of a pandemic;
- consider potential disparities between the care provided to refugees and displaced populations and that provided to the surrounding communities;
- strengthen partnerships with governments to ensure the coordination of activities between agencies and with local communities.

5. *Coordinate global science and accelerate vaccine development and expansion of production capacity*

Humanitarian agencies, in coordination with national or local public health authorities, may be requested to collect and transport samples from suspected cases to appropriate laboratories for virus characterization. WHO would provide the necessary technical and operational assistance with the relevant ministry of health.

5. Preparedness during the pandemic alert period

5.1 General measures

Key general preparedness measures should be undertaken during the pandemic alert period to prepare for the pandemic. Annex 1 provides a checklist with more detail on pandemic preparedness in refugee/displaced population settings. However, the key general steps are summarized below. Specific measures related to health-care facilities are detailed under pandemic mitigation in chapter 6.

Coordination

Coordination with national and local authorities, including emergency services if present, and with WHO and UN coordination mechanisms, e.g. the office of the UN System Influenza Coordination (UNSIC) and the UN Office for the Coordination of Humanitarian Affairs (OCHA), is crucial in ensuring:

- consistency with national preparedness and response activities;
- rapid two-way flow of information between authorities, WHO, agencies and health facilities;
- consistency in risk-communication messages being disseminated;
- movement of specimens and referral of patients if necessary.

Communication mechanisms should be set up in advance to serve these purposes.

Identify critical functions and back-up capacity

The pandemic alert period should be used to identify critical functions that will need to continue during the pandemic (for at least 8–12 weeks) and the people that will perform them. The operational capacity of humanitarian agencies may diminish owing to staff illness and absenteeism (potentially 30% or more for the duration of the first wave, as not only may staff fall ill but they may also need to stay at home to look after their sick relatives). Therefore, identifying first- and second-line (back-up) staff, particularly national staff and community volunteers, will be critical to ensure continuation of essential services.

It should be noted that rates of illness and absenteeism may not occur evenly over the period of the pandemic wave, but may follow the shape of an epidemic curve, with few staff ill in the first week and increasing to a peak that may well exceed a staff illness rate of 30% in the middle week of the pandemic wave.

Non-essential functions that will be temporarily halted also need to be identified as staff currently assigned to these activities can be used to back up essential functions.

International staff may be evacuated to their countries of origin, and thus ensuring local capacity is of prime importance.

The “recovered ill” – those who fall ill in the first wave of the pandemic and recover – should also be identified for surge capacity in the second and third waves of the pandemic, as they may have developed immunity to the virus.

Ensure a stockpile of food, water, medications, fuel, gas, oil for cooking, vehicles, generators

A sufficient stockpile will be needed for the population, staff and their families to keep essential functions running for the period of the pandemic. A buffer stock should also be kept so that others seeking care who are not normally served by the agency are not excluded.

Security for the population, health-care facility and staff

Security for the population and agency staff, as well as for health-care facilities and storage areas for food, medicines and supplies is crucial. Mass panic caused by widespread illness, perceived differences in treatment of one group versus another, or exclusion of some groups from distribution of available resources, may lead to clashes. Open access to care, early social mobilization and transparency in risk communication may help to minimize this possibility.

Travel restrictions

Decisions regarding phase changes will be made by WHO; further advice on travel restrictions will be issued concurrently. It is important that agencies have agreements in place for the deferral of non-essential travel during phases 4–5. Although general travel restrictions are not recommended by WHO in phase 6, it is likely that governments may impose such restrictions, and this should be taken into account in advance. An agency-specific policy for repatriation of international staff should be elaborated in advance.

5.2 Early warning surveillance and response

5.2.1 Objectives

Early warning surveillance is intended to detect initial cases of avian influenza A(H5N1) or other influenza viruses of pandemic potential in humans, when human-to-human transmission is not efficient and not sustained (i.e. WHO phases 3–5).

Application of simplified case definitions adapted to the local circumstances at community and health-care facility levels will promote:

- Early detection of initial cases/clusters or deaths, during the pandemic alert period (WHO phases 3–5) caused by avian influenza H5N1 or other influenza viruses of pandemic potential.
- The first indication of human cases of avian influenza or the start of a pandemic may be sick health-care workers or an increase in the number of patients with unexplained acute respiratory illness and fever or pneumonia of unknown origin. The case/cluster definition given in section 5.2.2 below will help in determining whether human-to-human transmission is occurring.

An outbreak coordination team (OCT) should be organized by the lead health agency in advance, and will be necessary in the pandemic alert period for the initial case/cluster investigation and the implementation of containment measures (see section 5.2.2). The OCT will also be needed during the pandemic, the size, scope and responsibilities of which will need to be much broader, for coordination of essential services, implementation of public health measures, managing public health information and limiting social disruption.

5.2.2 Sample case/cluster definition

The following case/cluster definition may be used to identify suspected cases of human-transmissible novel influenza virus, and may be included in the ongoing disease surveillance system. The detection of a cluster that meets the definition shown in the box below should be reported immediately to the OCT.

A cluster of 3 or more sick people or deaths, with onsets of illness within 7–10 days of each other, and who live within a defined geographical area

with

Unexplained¹ moderate-to-severe acute respiratory illness²

1. Unexplained: clinical, epidemiological, or laboratory evaluation does not determine a cause or etiological agent, such as a routine community-acquired pneumonia.
2. Moderate-to-severe respiratory illness: temperature > 38 °C, and either cough or shortness of breath or difficulty breathing, with or without clinical or radiological evidence of pneumonia.

If the above case/cluster definition is met during the pandemic alert period (WHO phases 3–5), a history of the following exposures should be elicited to help in detection of avian influenza A(H5N1) or other influenza viruses of pandemic potential in humans:

- travel to or residence in an area affected by avian influenza outbreaks in birds or other animals;
- direct contact with dead or sick birds or other animals in an affected area;
- close contact with a person (living or deceased) with unexplained severe acute respiratory illness;
- possible occupational exposure, through employment as an animal culler, veterinarian, laboratory worker or health-care worker.

However, any cluster of deaths from respiratory disease of unexplained cause should result in immediate reporting, regardless of contact history.

Features that may differ from normal seasonal human influenza include:

- unusual distribution by age group (e.g. younger age group, previously healthy);
- severe illness in adults in the absence of chronic disease;
- disease affecting health-care workers;
- excess deaths.

Animal surveillance

This document focuses on human cases only. However, communities should be sensitized to report any flock of sick or dead birds or animals (and especially the combination of sick bird/animal and sick owner) to the national authorities.

5.2.3 Response to detection of initial suspected cases

Fig. 1 illustrates the response to the detection of initial suspected cases.

Fig. 1 Case detection ^a

During WHO phases 3 to 5	During WHO phase 6
<ol style="list-style-type: none">1. Report suspected cluster immediately to relevant authorities/lead health agency and to WHO influenza@who.int and outbreak@who.int.2. Isolate suspected cases – all suspected cases should wear tightly-fitting masks when in close contact with others.3. Isolate those who have had close contact with suspected cases.4. Use descriptive epidemiology to characterize patients by person, place and time.5. Characterize the illness in terms of clinical presentation, severity and outcomes.6. Trace and follow up contacts of cases to detect additional cases.7. Initiate intensified case-finding to detect additional people with severe respiratory illness, especially those closely associated in time and place with the initial cluster of cases.8. Carry out risk communication and health education of community to promote respiratory etiquette and hand hygiene.9. Support national authorities and WHO in sample collection and transport/shipment within 48 hours (see guidance note below).	<ol style="list-style-type: none">1. Report to relevant authorities /health coordinator.2. Begin implementation of pandemic mitigation measures (see chapter 6).

^a Initial cluster of cases/deaths from fever and moderate-severe acute respiratory illness e.g. in refugee/IDP settings.

GUIDANCE NOTE

Specimen collection, storage and transport ^a

- The aim of sample collection is to detect and characterize the virus itself.
- Collection and shipment of specimens for testing is highly specialized.
- Nasopharyngeal and throat sampling with a Dacron swab is recommended.
- Full PPE, including particulate respirator mask (e.g. fit-tested NIOSH-certified N95, EU FFP2 or equivalent), gown, gloves and eye protection should be worn in phases 3–5.
- For isolation of the virus, storage and transport should be at -70 °C, which requires dry ice, a specialized shipping container, and a specialized shipping protocol as approved by the International Air Transport Association (IATA).
- Sampling, packing, shipping and testing of specimens should be arranged in liaison with national laboratories, the ministry of health and WHO.

^a Details may be found in Collecting, preserving and shipping specimens for the diagnosis of avian influenza A(H5N1) virus infection (ref. 5).

The WHO rapid containment strategy

If there is timely detection of human-to-human transmission of cases (phase 4), WHO may attempt activities to control or delay the spread of the virus. This will only happen in phase 4 as by the time phase 5 is declared, cases will be too widespread to contain. Modelling studies have indicated that a rapid response to initial cases using antivirals, isolation and quarantine may at least delay the spread of the virus. This delay could allow more time for production of vaccine and for other control measures to be put in place. A strategy of this type has never been attempted, and the obstacles to its successful implementation are formidable. Details are outlined in the document *Interim protocol: rapid operations to contain the initial emergence of pandemic influenza* (ref. 3).

Detection, investigation and reporting of the first cases should take place quickly for rapid containment of a pandemic to be possible. National authorities and WHO would jointly assess all relevant technical, operational and political factors to determine whether: (1) there is compelling evidence to suggest that a novel influenza virus has gained the ability to transmit easily enough from person to person to initiate and sustain community-level outbreaks; and, if so (2) there are any compelling reasons to defer a containment operation. Ultimately, the decision to launch a containment operation lies with national authorities.

The most important role of humanitarian agencies in the rapid operations strategy is a high index of suspicion and early detection, implementation of initial infection-control measures and reporting to the appropriate authorities.

The rapid containment strategy is a geographically-based approach in which antiviral medicines and non-pharmaceutical measures are used in a defined area surrounding the initial cases (i.e. Containment Zone) to restrict the virus from spreading beyond the Containment Zone. Intensive

surveillance for possible “break-through” cases would be done in a Buffer Zone surrounding the Containment Zone to evaluate whether the containment operation is succeeding.

Key measures in the Containment Zone:

- use of antiviral drugs for treatment and prophylaxis;
- movement restrictions in and out of the Containment Zone;
- use of additional non-pharmaceutical interventions.

Key measures in both Containment and Buffer zones:

- surveillance and laboratory testing;
- containment communications.

Major activities to be undertaken during the rapid response investigation of the index cluster in the Containment and Buffer zones during rapid containment are shown in Table 3.

Table 3: Major activities during the rapid response investigation of index cluster

	Initial cluster of cases	Containment Zone	Buffer Zone
Isolation and treatment of cases	Yes	Yes	Yes
Contact-tracing	Yes	Not routinely ^a	Yes
Antiviral prophylaxis	Contacts	Everyone	Contacts
Voluntary quarantine	Contacts	Contacts	Contacts
Respiratory/hand hygiene	Yes	Yes	Yes
Social distancing	No	Yes	No
Perimeter control	No	Yes	No
Surveillance strategy	Active surveillance: laboratory confirm all cases	Active and passive surveillance ^b : laboratory confirm sample of cases	Active and complete surveillance: laboratory confirm all cases

^a All contacts of possible cases identified after antiviral prophylaxis in the Containment Zone is completed should be traced.

^b Depending on the number of cases in the Containment Zone, both active and passive surveillance and a sampling scheme to laboratory-confirm cases may need to be used. After antiviral prophylaxis in the Containment Zone is completed, active and complete surveillance and laboratory-confirmation of all cases should be done.

Source: *Interim protocol: rapid operations to contain the initial emergence of pandemic influenza (ref. 3).*

5.3 Health communication during the pandemic alert period

5.3.1 Avian influenza and pandemic preparedness

The disease remains largely a disease of poultry which occasionally spreads to humans. Therefore, control of the disease at source in poultry is a priority and will in turn reduce the risks of human exposure and infection. Close collaboration and coordination between the agriculture and health sectors is required to ensure that communication interventions address risk-reduction practices that cover both animal and human health.

Objectives

1. To reduce animal exposure to avian influenza such as A(H5N1) by providing information to communities and promoting practices that avoid/reduce risks of backyard poultry becoming infected.
 - Avoid exposure/practices that expose healthy poultry to infected/dead animals and environments/surfaces that have had contact with infected/dead animals.
2. To reduce human exposure to avian influenza such as A(H5N1) by providing information to communities and promoting practices that reduce/avoid risks of exposure and infection.
 - Avoid exposure/practices that expose people to infected/dead animals and the environments/surfaces that have had contact with infected/dead animals.
 - Avoid exposure to contaminated food:
 - Properly cooked eggs and poultry meat are safe to consume.
 - Food preparation surfaces should be cleaned. Soap and water are sufficient.
3. To reinforce universal hygiene behaviours.
 - Respiratory etiquette (covering coughs and sneezes) and hand hygiene are crucial in limiting transmission before and during a pandemic, and also prevent transmission of a variety of waterborne and respiratory illnesses now.

5.3.2 Key behavioural messages for reducing animal-to-animal and animal-to-human transmission of avian influenza such as A(H5N1)

Report

- Report unusual sickness/death among poultry, wild birds and other animals immediately to the authorities.
- Report and seek treatment immediately if you have fever after contact with sick birds.

Separate

- Separate poultry:
 - (i) new stock kept apart for 2 weeks;
 - (ii) from wild birds;
 - (iii) from each other by species;
 - (iv) from living areas;
 - (v) from children.
- Burn and/or bury dead birds safely.

Wash

- Wash hands with running water and soap (or ash if soap not available) often, especially after touching birds, and before and after food preparation.
- Clean clothes, footwear, vehicles and cages with soap or disinfectant.

Cook

- Handle, prepare and consume poultry safely (i.e. cook poultry thoroughly until there is no pink flesh or blood, and cook eggs until they are no longer runny;
- before re-use, wash surfaces and utensils thoroughly with soap and water that have been used to prepare the poultry).

These priority messages and behavioural interventions need to be adapted in order to be culturally appropriate and context-specific as part of broader planned health communication interventions. For example, different routes of transmission and different practices require different messages for different population groups.

5.3.3 Reinforcing universal hygiene behaviours

Respiratory etiquette

- Cover coughs and sneezes (mask, tissue or cough/sneeze into sleeve, but not hands);
- do not spit in public;
- if using masks (or scarves), dispose of them (or wash them with soap and water and dry in the sun).

Wash hands

- Wash hands with soap and clean water carefully and often;
- clean surfaces.

5.4 Planning health communication during the pandemic alert period

Epidemics, in particular, cause confusion and often severe disruption to community life – however, they are not isolated events but happen within an existing social, cultural, political and economic setting. These settings and experiences will greatly influence what individuals believe and understand about the situation, and ultimately how they will respond to proposed (at times enforced) public health interventions. How local communities react and cope with a pandemic may be the decisive and critical dimension to limiting spread and reducing mortality. Planning can lay the groundwork for rapid communication in a time of crisis, prepare communities to take appropriate action and promote compliance with health measures.

There are a number of field-tested, evidence-based approaches and methodologies available that are communication-specific or have a strong health communication component, such as health promotion, health education, behaviour change communication, programme communication and social mobilization. The most familiar methods should be used however.

They should:

- be based on communication and behavioural theory and research;
- be informed by the sociocultural, economic and political context of the setting;
- be planned early with local authorities and communities;
- build on previous successful social mobilization campaigns and current related activities and programmes.

In addition:

- a handful of realistic and measurable behaviours should be identified;
- communication objectives should be identified and messages developed to help achieve these behaviours for different audiences;
- a communication plan should be set out with stakeholders, with clear coordination, management and implementation mechanisms;
- a blend of communication interventions should be integrated;
- results should be monitored and evaluated.

Five key action areas for effective social mobilization and communication*

1. Political and administrative mobilization/advocacy. Put the health risk and required behavioural interventions on the public agenda. Mobilize the publicly-expressed support of decision-makers and managers in the public and private sectors.
2. Community mobilization. Include participatory research, meetings, school activities, traditional media, music, song and dance, road shows, community drama, leaflets, posters, pamphlets, videos and home visits.
3. Sustained appropriate advertising. Using the available media, engage and remind people to review the merits of the recommended behaviour compared to the “cost” of carrying it out.
4. Interpersonal communication/counselling. Allow for careful listening to people’s concerns and address them.
5. Point-of-service promotion. Emphasize easily accessible and readily available outbreak response and treatment services.

* Based on the WHO communication for behavioural impact (COMBI) methodology.

See Annex 2B for key health communication activities during the pandemic alert period. More detailed health communication guidelines from the WHO/FAO/UNICEF meeting on behavioural interventions for avian influenza risk reduction, 14–16 March 2006, may be found at http://www.who.int/csr/disease/avian_influenza/adhocsummaryreport.pdf.

5.5 Health-facility planning

Health-facility planning should consider the following areas:

- Conferring with national health authorities regarding the national strategy for treatment and response in pandemic influenza -referral of patients (from any cause) is likely to be very difficult as a result of travel restrictions, and should be minimized.
- Assessing existing inpatient treatment capacity with regard to staff and facilities.

- Preparing for a rapid increase in demand for services during a pandemic, specifically regarding:
 - Surge capacity of health-care workers (national and international):
 - anticipation of absenteeism among staff;
 - anticipation of sick staff;
 - availability of back-up staff as needed, including trusted community members/volunteers and the recovered ill.
 - Infection-control infrastructure, including inpatient isolation facilities, protocols (see Annexes 3 & 4):
 - identification of a completely separate building or structure, e.g. a school, for use as a temporary respiratory illness health-care facility if feasible;
 - if a separate building unfeasible, creation of separate waiting areas for patients with fever/respiratory illness with triage protocols to ensure separation of patients with respiratory illness from other patients as well as the identification of severe cases for admission;
 - creation of a respiratory inpatient ward for patients with severe respiratory illness;
 - mechanisms to increase ventilation in wards and distancing between beds;
 - assessment of the inventory of existing personal protective equipment (PPE), with standard protocols for use and disposal;
 - protocol for waste management and environmental cleaning/disinfection;
 - training of health-care workers.
- Preparing treatment, referral and discharge protocols for influenza, and reviewing with staff as needed.
 - Stockpiling of:
 - soap and disinfectants;
 - antibiotics, intravenous (IV) fluids, other supportive treatments such as oxygen and antipyretics;
 - PPE (masks, goggles, gloves, waste-disposal bags, etc.);
 - tents for additional isolation areas as needed;
 - health education materials.

See Annex 6 for a PPE checklist.

- Protocols and prioritization strategy for vaccine and antiviral medication use, if available (see section 5.6.4 and Annex 7).
- Management of dead bodies (see section 6.6.6).

5.6 Protection of staff

Rigorous attention to standard precautions (see glossary) is required to reduce the opportunities for transmission in the health-care setting. Mechanisms for procuring (and/or stockpiling) antibiotics, PPE, antivirals and vaccines (when/if available) should be considered, with protocols and prioritization for their use.

Priority recipients will include those involved in direct clinical contact with patients, and those staff required to maintain essential functions.

Source control (i.e. of the ill person) is crucial, as this can prevent opportunities for transmission; the patient must be encouraged at all times to cough/sneeze into a tissue/cloth or into their sleeve.

A referral strategy for treatment of ill health-care workers should be in place addressing when, where and how staff referral would be implemented.

5.6.1 Masks

Use of masks should be prioritized to ensure that those at highest risk of exposure have access to available protection. Masks do not have to be worn at all times as they may become uncomfortable, particularly in hot climates. They should be worn by health-care workers and caregivers, and other essential staff when in close contact with sick patients (< 1 m distance). See section 5.6.4 for guidance on prioritization of masks among staff, and section 6.4.5 for guidance notes on masks and personal protective equipment.

5.6.2 Antibiotics and antivirals

Antibiotics.

Consideration should be given to stockpiling quantities of antibiotics sufficient to treat secondary bacterial pneumonia in at least 5–10% of total staff and dependents (see Table 1 in section 2.2).

Antivirals.

If feasible and where quantities are available, agencies should stockpile sufficient oseltamivir to provide for treatment and prophylaxis of staff. The stockpile amounts may be increased as resources allow and based upon specific agency considerations.

The order of priority for antiviral use should be:

- treatment of sick health-care and essential staff;
- treatment of sick individuals;
- post-exposure prophylaxis for critical staff with unprotected, high-risk exposure;
- pre-exposure prophylaxis for 8 weeks for critical staff with anticipated high-risk exposure.

See section 5.6.4 for guidance on prioritization of antivirals among staff, and Annex 7 for antiviral use and dosages.

5.6.3 Vaccines

- Seasonal human influenza vaccine is currently recommended annually for all staff working in health facilities to protect against seasonal human influenza.
- An H5N1 prototype vaccine might become available for selected use in the future.
- Pandemic vaccines may be used to prevent disease due to a novel pandemic virus. Vaccine production may take 2–6 months as it can commence only once a novel pandemic virus is sampled and characterized, and therefore vaccine is likely to be deployed only from the second wave of the pandemic. Mass deployment of vaccine is being planned in the second wave of the pandemic and plans for mass distribution of vaccine and mass vaccination may need to be

elaborated. However, quantities of vaccine are likely to be limited and insufficient to cover the global population.

See section 5.6.4 for guidance on prioritization of vaccine.

5.6.4 Prioritization for use of masks, antivirals and vaccine among staff

Group	Rationale
Health-care workers	<ul style="list-style-type: none"> ▪ Health-care workers are the highest risk group for infection. ▪ Health-care workers, if infected, may transmit illness to vulnerable patients. ▪ Health-care staff provide essential care for the sick that may reduce morbidity and mortality.
Essential staff	<ul style="list-style-type: none"> ▪ To maintain essential services. ▪ Includes security guards, food preparers and distributors, water handlers – i.e. any person who may potentially have close contact with groups of people and therefore be at increased risk of exposure to an infected individual and contracting influenza, and then be potentially able to transmit it to others.

5.6.5 Management of ill staff

- Screen for symptoms of influenza-like illness among staff reporting for duty (fever, cough).
- Staff with direct patient contact should self-monitor for fever (twice-daily temperature) and cough for 7 days after time of last exposure (in practice, this may be for the entire duration of the pandemic).
- If symptoms occur, staff should limit contact with others and notify infection-control team/hospital authorities or the health coordinator immediately.
- Staff members who are unwell should not be involved in direct patient care.
- A staff member who has fever (> 38 °C) and who has direct patient care should stop working and should ideally be immediately treated with an antiviral (see Annex 7).
- Other staff members who fall ill and who do not have direct patient-care responsibilities should wear a simple surgical or procedure mask in order to limit the spread of the virus. They should also stop working and be treated as other patients.
- Only if stocks allow, consider antiviral post-exposure prophylaxis for critical staff with frequent high-risk exposure (see Annex 7). Self-monitor for fever (twice daily temperature) and cough for 7 days from time of last exposure (in practice, this may be for the entire duration of the pandemic).

5.6.6 Referrals

- Movement of patients should be minimized as much as possible.
- Standard operating procedures should be developed for the transportation, admission and management of ill staff.
- Local medical facilities should be identified for care of ill staff.
- Medical evacuation (including for international staff) may not be feasible as a result of travel restrictions imposed by governments, but should be considered to meet the health-care needs of the individual.

5.6.7 Evacuation/repatriation of international staff

- Each agency is responsible for formulating an evacuation policy for international staff. Agencies should also consider the impact of potential evacuation of international staff on

overall programme capacity. Preparedness measures should therefore necessarily emphasize the primary role of local staff in pandemic mitigation efforts.

6. Pandemic mitigation: minimizing impact during the pandemic (WHO phase 6)

6.1 Key measures

Known public health measures taken by individuals and communities, such as social distancing, respiratory etiquette, hand hygiene, and household ventilation, are the most feasible measures currently available to reduce or delay disease (morbidity) and death (mortality) caused by pandemic influenza.

Antiviral treatment decreases the duration of virus excretion, severity of illness and risk of complications in seasonal influenza. However, global availability of antiviral agents is insufficient and it is unknown how effective they would be against pandemic influenza caused by a novel human strain.

Pandemic vaccines may be used to prevent disease. However, vaccine production and distribution could take 2–6 months or longer because it can only commence once a pandemic virus is sampled and characterized. Quantities of vaccine would also be insufficient to cover the global population.

Once a pandemic has started, i.e. there is increasing and sustained transmission in the general population of even one country:

- Worldwide spread is considered virtually inevitable, and the public health response would focus on reducing impact and delaying spread through the early and sustained implementation of non-pharmacological measures such as social distancing, respiratory etiquette and hand hygiene.
- Evidence and experience suggest that interventions to isolate patients and quarantine contacts (once the first patients have already been detected in a community) would probably be ineffective, not a good use of limited health resources, and socially disruptive.
- In the setting of sustained transmission in the general population, ill people should as far as possible be cared for at home by a designated caregiver (with appropriate home-care instructions communicated in advance) and advised not to attend health facilities unless they develop general danger signs so as not to overwhelm health facilities (see guidance note in section 6.5.2).
- Measures to increase social distance (see section 6.4.2 for guidance note on social distancing) should be considered in affected communities, depending on the epidemiology of transmission, severity of disease (case-fatality ratio) and risk groups affected (consult WHO for up-to-date advice at the time).
- Respiratory etiquette and hand hygiene should be routine for all and strongly encouraged in public health messages even prior to the pandemic being declared.
- WHO has recommended that mask use should be based on risk, including frequency of exposure and closeness of contact with potentially infectious people. Routine mask use in public places should be permitted but is not expected to have an impact.
- Household surfaces likely to have been contaminated by infectious secretions should be cleaned with soap and water.

6.2 Maintenance of essential services

Critical functions

Critical functions (and who performs them) that will continue during the pandemic should have been identified in the pandemic alert phase.

They include:

- delivery of food and safe water;
- provision of essential health services;
- supplying essential materials such as soap and essential medicines/supplies;
- ensuring security/protection for the population, staff and good/supplies;
- ensuring fuel/other supplies to enable cooking, functioning of generators, etc.;
- ensuring that appropriate and timely information is available to inform decision-making and response through regular communication with external networks and agencies.

6.3 Surveillance

Pandemic influenza introduced into crowded refugee/displaced population settings may be expected to spread quickly.

During pandemic transmission of a novel influenza virus, impact mitigation activities should take precedence over surveillance activities.

However, some surveillance functions will be important:

1. Detecting the initial cases of suspected pandemic influenza in a particular community will be a key function of the surveillance system.
 - The initial suspected cases should be reported to the relevant public health authorities and WHO. Confirmatory testing will be at the discretion of the national authorities/WHO.
2. Monitoring the spread of cases
 - Case definitions may be expected to change as the pandemic evolves; surveillance itself is of limited value during peak transmission.
 - Cases and deaths from suspected influenza should be counted as long as practicable, using aggregate data.
 - Final estimates of mortality may rely on census data.
3. Monitoring availability of health care and other essential services.

6.4 Infection control in the health-care facility and at home¹

6.4.1 Respiratory etiquette and hand hygiene

Given that transmission of influenza predominantly occurs through inhalation of respiratory droplets produced when people cough or sneeze, preventive respiratory etiquette should be reinforced generally. This "source control" is a priority, and respiratory etiquette involves covering coughs/sneezes with a tissue/cloth or coughing/sneezing into one's sleeve to prevent the dispersion of respiratory droplets into the air. In refugee and IDP settings, where overcrowding is often present, this preventive measure is all the more important.

When someone coughs or sneezes, respiratory droplets that contain viruses may also land on their hands, their clothes, surfaces (tables, door knobs/handles, plates, cups, etc.). Thus touching someone's hands or clothes, or surfaces, and then touching the mouth or nose or eye without washing hands first, or using utensils without washing them, may also transmit the virus. This is another way, but probably less important than inhalation of respiratory droplets, of transmitting influenza. Thus hand washing/hygiene may also help prevent transmission.

GUIDANCE NOTE

Respiratory etiquette and hand hygiene

- As transmission of influenza occurs mainly through inhalation of respiratory droplets produced when someone coughs and sneezes, covering coughs and sneezes with a cloth/tissue or coughing/sneezing into one's sleeve may help to reduce the spray of respiratory droplets that carry the virus.
- As respiratory droplets may land on someone's hand or clothes when they cough/sneeze, hands must be washed after direct contact with other people (i.e. if you have touched their hands or clothes).
- As respiratory droplets may land on a surface and survive for several days (depending on the ambient temperature), hands should be washed and surfaces cleaned regularly to avoid self-contamination (by touching a surface then touching your mouth or nose or eyes).
- Water and soap are sufficient to kill the virus. Alcohol-based rubs may also be used and may be easier to implement in some settings such as health-care facilities.
- Hand hygiene is a key measure to prevent the spread of many infections within a health-care facility. Ensuring an adequate supply of soap and water for washing is crucial.
- Hands should be cleaned by washing with soap and water for 20 seconds before rinsing, or by means of hand rubbing with an alcohol-based preparation until hands are dry (see Annex 3).
- Hand hygiene must be performed after all patient contact, after removing PPE, after cleaning, after handling soiled linen and waste, and after contact with laboratory specimens.

¹ For more details see *Infection prevention and control of epidemic- and pandemic-prone acute respiratory diseases in health care (ref. 1)*.

6.4.2 Social distancing

If the physical distance that people maintain from each other during their daily lives is small, the likelihood of transmitting influenza when someone coughs or sneezes is high. Thus crowding is a major risk factor for influenza transmission, and efforts to relieve overcrowding and minimize gatherings of people should be attempted (this is called "social distancing" – see guidance note below).

GUIDANCE NOTE

Social distancing

- Transmission of influenza is highest when there is close contact between people i.e. when they are within 1m of each other.
- People should try to maintain at least 1m distance from others to avoid contracting influenza or transmitting it to others.
- Ill people should be encouraged to remain at home as soon as symptoms develop and restrict close contact with others.
- Gatherings, owing to the close proximity of people, offer an opportunity for transmission and should be discouraged, e.g. schools may need to be closed, sporting events deferred, mourners at funerals might reduce transmission by wearing masks/scarves, etc.
- Food and water distribution in camps should be decentralized as much as possible, again to discourage large gatherings of people. Delivery of goods and services to the place of residence, if possible, is optimal. One designated healthy member of a household might be assigned to water/food collection.
- Population movements should generally be discouraged:
 - halt movement to and from transit camps;
 - movement of symptomatic patients and staff should be avoided.
- Essential health-care services, including therapeutic feeding centres, must be continued. However, measures to increase space between patients and beds should be implemented (including head-to-toe positioning of patients when space is limited in order to maximize distance between heads of patients).

6.4.3 Ventilation

If houses/tents are well ventilated, transmission of respiratory droplets will also be greatly reduced. Thus houses/tents should be kept as open as possible to allow a good flow of air. This is particularly important in overcrowded refugee and IDP settings. Ventilation of houses will obviously be much easier in hot compared to colder climates.

6.4.4 Key infection-control principles for reducing influenza transmission in health-care facilities

There are four main principles to limit the spread of respiratory infection in the health-care facility:

Reduction/elimination at the source (the patient)

This involves limiting dispersion of infectious droplets from the patient or "source control":

- promotion of respiratory etiquette and hand hygiene at all times (patient covers coughs and sneezes by wearing a mask when in close contact with others, and washes hands before and after activities to limit dispersion of infectious particles);
- treatment of patient to render the patient non-infectious.

Environmental controls

These include methods to reduce the concentration of infectious respiratory aerosols in the air and to reduce the presence of contaminated surfaces and items:

- adequate ventilation to ensure good air flow and prevent concentration of respiratory particles;
- separating influenza patients from other patients to reduce the risk of transmission of infection from the source patient to others by reducing direct or indirect contact transmission;
- limiting contact between infected and uninfected people, such as nonessential health-care workers and visitors, reduces the risk of transmission to susceptible individuals;
- spatial separation (> 1 m) between patients including head-to-toe positioning of patient beds if space is limited;
- cleaning and disinfection of contaminated surfaces and items.

Administrative controls

These include establishing an appropriate infection-control infrastructure and implementation of appropriate infection-control measures:

- standard and droplet precautions (see below);
- regular supplies and organization of services (e.g. creation of patient triage system and placement);
- staff planning to promote an adequate patient-to-staff ratio, short shifts of 4–6 hours (maximum of 8 hours) to prevent errors, and back-up staff to take over essential duties when first-tier staff are sick;
- staff health programmes (e.g. vaccination, prophylaxis) to enhance the general health of health-care workers.

Personal protective equipment (PPE)

The above strategies reduce, but do not eliminate the possibility of exposure to biological risks. Therefore, to further reduce these risks to health-care workers and other persons interacting with patients in the health-care facility, PPE should be used together with the above strategies in specific situations that pose an increased risk of pathogen transmission:

- PPE use should be defined according to risk of exposure to the influenza virus.
- The effectiveness of PPE is dependent on adequate and regular supplies, adequate staff training, proper hand hygiene, and appropriate human behaviour.

For human influenza, both standard and droplet precautions are recommended.

Standard Precautions are routine infection-control precautions that should apply to **all** patients in **all** health-care settings. They involve:

- respiratory etiquette and hygiene (cover coughs and sneezes);
- handwashing;
- use of PPE when handling blood, body substances, excretions and secretions, including eyewear if splashes onto eye mucosa are anticipated. Eye protection is not necessary for those not directly attending patients;
- prevention of needle-stick/sharp injuries;
- appropriate handling of patient-care equipment and soiled linen;
- thorough cleaning of surfaces likely to be contaminated by infectious secretions (environmental cleaning and spills management);
- appropriate handling of waste.

Droplet Precautions (as compared to Standard Precautions) require the additional use of surgical or procedure masks for routine care of influenza patients.

Any aerosol-generating procedure associated with increased risk of disease transmission however should require use of full PPE – particulate respirator masks (e.g. NIOSH-certified N95, EU FFP2 or equivalent masks), goggles, gowns and gloves. Such procedures include endotracheal intubation, nebulizer treatment, suctioning, or surgery and autopsy where high-speed devices (such as drills/saws) are used. For more details see: Infection prevention and control of epidemic- and pandemic-prone acute respiratory diseases in health care (ref. 1). See Annex 3 for further details on infection-control procedures in the health-care facility.

6.4.5 Use of PPE

GUIDANCE NOTE

Use of masks during an influenza pandemic

- Masks, if properly worn, are likely to be the most effective of all PPE used in a pandemic.
- Priority for use of masks in health-care facilities is as follows: (a) protect caregivers and health-care staff, i.e. those in close contact with patients; (b) control transmission at the source (the patient).
- Surgical masks (usually with tie-ons) or procedure masks (usually with ear loops) are recommended for routine care provided by health-care workers, other essential staff and caregivers, when they are in close contact with patients (i.e. < 1 m away). They are not necessary when not in close contact with patients.
- If sufficient stocks exist, surgical/procedure masks are recommended for patients when they are in close contact with others (i.e. < 1 m away). This may not always be feasible (e.g. when the patient is on oxygen therapy) and thus patients must be encouraged to cover coughs/sneezes with a cloth or to cough/sneeze into their sleeve at all times.

- Particulate respirator masks (e.g. NIOSH-certified N95, EU FFP2 or equivalent masks) are recommended for aerosol-generating situations/procedures associated with an increased risk of respiratory disease transmission (endotracheal intubation, nebulizer treatment, suctioning, or surgery and autopsy where high-speed devices such as drills/saws are used), along with goggles, gowns and gloves. Particulate respirator masks should be used according to the manufacturer's instructions and the user should perform a seal check before each use, for which training is required. When particulate respirators are not used properly, their effectiveness may be no greater than surgical or procedure masks.
- All medical masks (particulate respirator, surgical, procedure) should fit the user's face tightly, covering the mouth and nose, and be discarded immediately after use. If the mask gets wet or dirty with secretions, it must be changed immediately. After removing or changing masks, hand hygiene should be performed.
- It is unknown to what extent scarves provide protection, and different types of fabric may change the level of protection. However, if masks run out, it is suggested that tightly-fitting scarves covering the mouth and nose be used as a last resort by health-care workers, other essential staff and caregivers providing routine care. For patients, wearing scarves (as with masks) may not be feasible in health-care facilities (limited stocks or on therapy with oxygen in inpatient ward) and therefore patients must be encouraged to cover coughs/sneezes with a cloth or to cough/sneeze into their sleeve at all times.
- The scarf or cloth, tied behind the head, must cover the mouth and nose and fit tightly around the face and chin area to prevent gaps, and be discarded as with masks after use or when wet or visibly soiled. These may be washed with soap and water and dried in the sun to reuse.
- Care must be taken not to touch the face or mask with the hands in order to avoid contamination from droplets that may be on the outside of the mask.
- Any respiratory aerosol-generating procedures (as described above) should be performed with full PPE, including particulate respirator masks, eye protection, gloves and gowns, whenever possible.
- PPE items must be disposed of appropriately after each use and within the patient's room before exiting.

See Annex 3 for instructions on putting on and removing masks; see Annex 6 for sample stockpile calculations and available masks.

GUIDANCE NOTE

Use of other PPE

- Routinely assess the risk of exposure to body substances or contaminated surfaces before any anticipated health-care activity.
 - Select PPE based on the assessment of risk.
 - Have appropriate PPE available in the event of an unexpected emergency.
- *Eye protection* with goggles or a visor should also be used in conjunction with masks when in direct close contact with a patient (1 m or less), and sprays of secretions onto the eye mucosa are anticipated. Eye protection is not necessary when not in close contact with patients.
- *Gloves* should be worn if contact with blood, body fluids, respiratory secretions, excretions, mucous membranes or non-intact skin is anticipated, including during aerosol-generating procedures associated with a definite risk of pathogen transmission.
 - Gloves do not provide full protection against hand contamination: hand hygiene should be performed immediately after glove removal.
 - Change gloves between tasks and procedures on the same patient after contact with potentially infectious material.
 - Remove gloves after use, before touching non-contaminated items and surfaces, and before going to another patient.
 - Perform hand hygiene immediately after glove removal.
- *Gowns* should be worn to protect skin and prevent soiling of clothing during activities that are likely to generate splashes or sprays of blood, body fluids, secretions or excretions.
 - Select a gown that is appropriate for the activity and amount of fluid likely to be encountered. If the gown in use is not fluid-resistant, a waterproof apron should be worn over the gown if splashing or spraying of potentially infectious material is anticipated.
 - Remove soiled gown as soon as possible, place it in a waste or laundry receptacle (as appropriate), and perform hand hygiene.

See Annex 3 for instructions on putting on and removing PPE.

6.4.6 Infection control in outpatient areas

Outpatient departments should expect large numbers of influenza patients. Separation of patients to limit potential transmission will be necessary. Annex 4 provides a sample configuration of a respiratory health-care facility. The following measures should be in place:

Separation

- A completely separate building or structure if possible, for use as a temporary respiratory health-care facility (e.g. school, open tent) with:
 - a separate outpatient waiting facility, "respiratory waiting room" or "respiratory clinic" for patients with suspected influenza (acute respiratory illness); and
 - a separate respiratory inpatient ward (see section 6.4.7).
- Spatial separation between patients within the respiratory clinic (at least 1 m distance).
- Spatial separation between the respiratory clinic and other waiting areas.
- Good ventilation to encourage air flow from the facility.

Triage within health-care facilities

- A pre-agreed triage mechanism, so that patients with acute respiratory illnesses attending outpatient facilities may be directed to the "respiratory clinic", to avoid contact with other patients. This should occur before entering usual outpatient department waiting areas through:
 - signs or posters directing people with fever/acute respiratory symptoms (cough or shortness of breath) to appropriate waiting areas;
 - monitoring of correct use of triage case-definitions and waiting areas (see below).

Suggested triage case definition

(For screening to determine if access to respiratory clinic is appropriate)

Triage definition: fever ≥ 38 °C + acute onset of cough or shortness of breath.

Action: give patients surgical or procedure masks and put in the separate "respiratory" waiting area or clinic for assessment, and promote at least 1m distance between patients.

Encourage respiratory etiquette at all times (cover coughs and sneezes or cough/sneeze into sleeve if no masks are available).

Plan for surge capacity

- There should be ability to expand the respiratory health-care facility quickly if there is a surge of patients.

PPE according to risk

- Encouragement of respiratory etiquette at all times (cover coughs and sneezes).
- Masks given to all patients in the respiratory clinic if available.
- Masks given to anyone in close contact with patients (1 m or less).
- Access to soap/towels, alcohol handrub, PPE as required.
- PPE and clinical waste disposal mechanisms (see section 6.4.9).
- Handwashing facilities with adequate water (see Annex 3 for handwash/handrub procedure).

Patient transfer

- Although a large proportion of patients may be dealt with at the outpatient level during the pandemic, hospitalization may still be required for severely-ill patients.

- Ideally, only severe cases likely to benefit from available supportive care should be admitted to the respiratory inpatient ward. Other cases should be sent home with home-care instructions. A palliative-care inpatient ward may be warranted depending on local customs.
- Patient-flow mechanisms in place, to ensure:
 - one-way flow of people;
 - discharged patients have minimal contact with other patients on their way out;
 - patients being admitted to respiratory inpatient ward can be moved without going through other general wards.

6.4.7 Infection control in the respiratory inpatient ward

A separate structure for inpatient treatment is necessary for treatment of severe cases, and should be identified in advance. This may be within the separate respiratory health-care facility or in a school or tent, depending on available space. The following measures should be in place in the inpatient ward:

- Capacity for rapid expansion of the respiratory inpatient ward or an overflow area if there is a surge of severely-ill patients.
- Good ventilation to encourage air flow.
- Limited number of visitors.
- Minimal number of entries and exits to the respiratory inpatient ward.
- Ideally an 8-hour shift limit for health-care workers on duty in the respiratory inpatient ward, if feasible.
- Placement of clean PPE on a trolley outside the ward.
- Means to dispose of used PPE, other waste and used linen inside the ward.
- Dedicated ward equipment if possible (such as blood-pressure cuffs, stethoscopes, oxygen masks and tubing).
- Ward free of excessive equipment or furniture.

If a very large surge in cases occurs, special respiratory inpatient wards may not be practicable and health facilities should be arranged to:

- ensure as much spatial separation between patients as possible (at least 1 m distance);
- ensure head-to-toe alignment of patient beds if space is restricted.

Annex 3 provides further detailed infection-control procedures in a respiratory inpatient ward.

6.4.8 Infection control at home

The patient should:

- Follow respiratory etiquette – i.e. cover the mouth and nose with a tissue or cloth when coughing or sneezing (or cough/sneeze into sleeve) (see sample health education messages in Annex 2A).
- Ensure proper hand hygiene.
- Avoid close contact with uninfected people until the end of the infectious period (this is unknown for a novel pandemic influenza virus and may be from 5 days after the onset of symptoms for adults and up to 10 days or more after the onset of symptoms in children – more accurate information can only be provided when virus epidemiology is characterized after the start of a pandemic).

The caregiver should:

- Be advised to take proper precautions (hand hygiene and respiratory etiquette measures, covering their mouth and nose with a mask (if available), or scarf as a last resort, tied at the back of the head when in close contact with patients. Use of masks at the household level may be difficult as training is required and appropriate disposal bags must be provided and incineration arranged. See Annex 3 for removal and disposal of masks, and section 6.4.9 for waste management. If wet or dirty with secretions, dispose of masks (if available), or wash scarf with soap and water. Reuse of scarves has a risk of transmission and therefore, if scarves are reused, they must be washed and dried thoroughly and hand hygiene performed afterwards.
- Perform hand hygiene frequently.
- Avoid close contact (< 1 m) with uninfected people if they develop a fever or cough.
- Facilitate air circulation (open windows or tent when climate allows).
- Wash clothes, bed-linen and scarves that have been in contact with patients' respiratory secretions or stools. Running water and soap should be used for washing, and hands should be washed thoroughly afterwards with soap and water. Dry clothes/bed-linen/scarves in the sun.

Additionally, households should be provided with:

- Information for family members regarding adequate hygiene measures (see Annex 2A), steps to take after exposure, etc. This might include pamphlets or other material with key health education messages in local language.
- Community leaders and traditional healers can play a crucial role as information providers, especially in populations with low literacy levels.

6.4.9 Clinical waste management

- Follow routine procedures for waste generated at health facilities.
 - Masks and goggles/visors are only necessary if close contact with a patient is anticipated during waste collection.
 - Clinical (infectious) waste is defined as sharps used for patient care (needles), tissue residues from wound care, placenta/organs/etc., and PPE items used for patient care.
 - Clinical waste generated in the care of influenza patients should be disposed of in suitable "biohazard" bags inside the room where the waste was generated; needles should be disposed of in sharps boxes.
 - Incineration is the preferred method of clinical waste disposal; tissue/placenta/organs should be buried.
 - Goggles are reusable and should not be discarded – they should be cleaned prior to sterilization and reuse.
 - Gloves must be worn when removing waste bags.
 - Hand hygiene must be performed after handling clinical waste.
- Waste collectors and those in charge of waste incineration should be appropriately trained.

6.4.10 Environmental cleaning and disinfection

- Clean and disinfect patient areas daily, with particular attention to frequently touched surfaces such as counter tops, door handles and medical equipment.

- The following PPE must be worn during cleaning: heavy duty gloves, boots, gown and waterproof apron.
- Masks and goggles/visors are only necessary if close contact with a patient is anticipated during the cleaning process.
- It is important to clean first then disinfect, using two buckets – one for washing and one for rinsing.
- Bleach (sodium hypochlorite) 500 ppm or 0.05% should be used for disinfection of material contaminated with body fluids:
- several concentrations may be marketed (e.g. 1%, 2.5%, 5%) which need to be diluted to the required concentration above (see Annex 5 for method of dilution).
- Bleaching powder (7g/1 litre water, i.e. 70% available chlorine) should be used for disinfection of toilets/bathrooms.

6.5 Clinical management

The objectives of the management of infectious cases are to provide supportive health care and to minimize transmission. Given limited resources, it will be necessary to triage patients for treatment during a pandemic to maximize the impact of available treatment capacity. Essential medical services should be continued, while elective and non-essential medical services should be temporarily suspended. Patients are most likely to be managed in two distinct settings: in the health-care facility and at home.

6.5.1 Treatment in the health-care facility

- Admission criteria may change depending on bed availability, but should be reserved for those most likely to benefit from treatment.
- A caregiver, preferably an available family member, should be identified if possible to manage care of the ill patient in the home (or tent) if the patient is being discharged.
- Health facilities should anticipate a very high demand for treatment with supportive care, and should plan accordingly. Based on current estimates, agencies should anticipate that up to 10% of those who fall ill may require inpatient treatment in a refugee or IDP setting. In a population of 10 000, this could mean 500–600 persons requiring inpatient care for influenza alone over a period of 2–3 months, or approximately 6–10 patients per day. These figures are an average to assist calculations. Note that the number of patients affected per week may not be constant over the pandemic period: it is likely that there will be increasing numbers affected per week, reaching a peak in the middle of the pandemic (weeks 4–8) with decreasing numbers thereafter.

Ensure:

- availability of admission and discharge criteria (these are likely to change depending on treatment capacity);
- confinement in a separate respiratory ward for patients admitted with suspected pandemic influenza (see Annex 4);
- availability of case-management protocols;
- referral protocol, if feasible;
- adherence to Standard and Droplet Precautions (see section 6.4.4 and Annex 3).

Inpatient treatment in refugee and IDP settings should include:

- treatment of dehydration with IV or oral rehydration fluids;
- supplemental oxygen therapy (if available) by face mask rather than nasal prongs, for hypoxia;
- antibiotic (oral and parenteral) treatment of secondary bacterial infections (see guidance note below);
- non-aspirin antipyretics for pain and fever as needed;
- nutritional supplementation as needed.

Note: in HIV-infected individuals, a distinction between opportunistic pneumonia and secondary pneumonia from pandemic influenza may be difficult.

Antiviral medicines decrease the duration of virus excretion and the severity of illness when used for treatment of seasonal influenza, and may prevent illness when used for prophylaxis. However, global availability of antiviral agents is insufficient, and it is unknown how effective they may be against pandemic influenza caused by a novel human strain. If antivirals are available, criteria should be developed for their prioritization and use, and protocols and instructions for treatment of sick individuals should be made generally available. If only limited quantities are available, a strategy for prioritization of use should be in place according to national protocol (see 5.6.3 and 5.6.5). See Annex 7 for guidance on antiviral use and dosages.

Patient referral

- Limit movement and transport of patients as much as possible.
- Provide supplemental oxygen to patient if available and do not remove oxygen during transport.
- Place a surgical or procedure mask on the patient.
- Staff should wear a mask and goggle/visor (see guidance note on PPE in section 6.4.5) when in close contact with the patient.
- Staff should also wear gloves, gowns, aprons and boots as per Standard Precautions if contact with the patient's secretions/body fluids is anticipated.
- Surfaces in the ambulance must be cleaned and disinfected.

Patient discharge

- Ensure that the patient and family have been educated as to what precautions to take.
- The patient should avoid close contact with others up to 7 days after symptoms have disappeared (this period may need to be longer for children, although this may be difficult to achieve in practice).
- Family members should monitor themselves daily for fever and cough.
- Follow instructions for home-based care (see section 6.5.2).

GUIDANCE NOTE

Therapeutic feeding centres for the malnourished

- Malnutrition may be a major problem in many refugee and IDP settings. Therapeutic feeding for severely malnourished populations must continue throughout the pandemic. Supplementary feeding may be continued by advance collection of food.
- Therapeutic feeding centres should contain a separate isolation area for patients with suspected influenza and severe malnutrition.
- To minimize case-load, mechanisms to institute "home-based" therapeutic feeding might be established for malnourished children without other severe medical illness, using therapeutic feeding centre protocols.

GUIDANCE NOTE

Antibiotics*

- Pandemic transmission of a novel influenza strain is likely to be associated with pure viral, mixed viral/bacterial and secondary bacterial pneumonia. Antibiotics could be a life-saving intervention for secondary bacterial pneumonia.
- The goal of providing rapid outpatient antibiotic treatment is to reduce the number of cases of severe secondary bacterial infection requiring treatment in a hospital facility.
- Recommended antibiotics will depend on the type of bacteria causing the pneumonia, and its local antibiotic resistance patterns. Data from past pandemics show that most secondary bacterial pneumonia was caused by Gram-positive cocci such as *Streptococcus pneumoniae* followed by *Staphylococcus aureus*, and sometimes by Gram-negative rods such as *Haemophilus influenzae*.
- Antibiotics suggested in this case include:
 - first-line (oral): beta-lactams such as amoxicillin or amoxicillin/clavulanic acid; or macrolides such as erythromycin;
 - first-line (parenteral): beta-lactams such as ampicillin;
 - second-line (parenteral): third-generation cephalosporin such as ceftriaxone.
- *This information will be updated when more information becomes available. See Annex 6 for antibiotic posology and dosing.

6.5.2 Treatment at home

- During a pandemic, very high numbers of patients presenting to the health-care facility will necessitate home treatment.
- Trusted community leaders should be identified in advance for crowd control at the health-care facility and to address concerns among health-seeking refugees/IDPs and their caregivers.
- Ill people should be encouraged (through health messaging) to institute respiratory etiquette (cover coughs and sneezes or cough/sneeze into sleeve) and hand hygiene, and restrict close contact (< 1 m) with others as much as possible.
- Home confinement of ill people in crowded refugee/IDP settings may not be practicable. However, restricting contact with others should be encouraged.
- Adequate supervision within the household of the ill person should be ensured with preferably one caregiver per patient to limit potential exposure.
- Caregivers should cover their mouth and nose when in close contact with patients.
- Patients and caregivers should be trained to wear and dispose of masks during the infectious period of the patient, if supplies are available. Where supplies are limited, it is more important that in the home, the patient wears the mask when in close contact with others than the caregiver. Tightly-fitting scarves or a reusable mask made of cloth covering the mouth and nose could be used if masks are unavailable. They should be washed daily.
- The caregiver should always wash hands after patient contact.
- General support and advice should be given on the use of antipyretics (acetylsalicylic acid should be avoided in children), oral fluids, nutrition and bed rest.
- Instructions must be provided on the use of antibiotics (if necessary) for bacterial complications of influenza when prescribed.
- Instructions for further care in case of deterioration (if capacity exists) should be given (i.e. when there are symptoms of severe illness or dehydration – see guidance note below).
- Those who have recovered are no longer infectious and now immune (usually 2–3 weeks after the onset of illness), and can help in care of others: this will be particularly important in the second and third waves of the pandemic.
- Proper respiratory etiquette and hand hygiene must be promoted for all household members.
- Keep windows open and allow ventilation of the room/tent.

GUIDANCE NOTE

Referral to health-care facilities

- The majority of influenza cases may be cared for at home with the simple supportive care outlined above.
- However, if there is deterioration or severe symptoms, then patients may need to access a health-care facility.
- These symptoms may include: weakness/not able to stand, lethargy, unconsciousness, convulsions, very difficult/obstructed breathing or shortness of breath, inability to drink fluids and dehydration, high fever.
- It is important that specific instructions are provided according to the local context.

6.5.3 Kits for home caregivers

A kit of materials needed for home (or tent) care of these patients should be prepared in advance. This should facilitate a consistent approach to home care for patients who have been discharged from the health-care facility, or for patients who choose to remain at home. The kit may also be given in advance to encourage public health measures to decrease or delay transmission in the community. Proper use of the kits should be thoroughly explained in advance by community health workers.

Suggested materials for inclusion in the home-care kit:

- surgical or procedure masks or scarves for patients and caregivers, if sufficient quantities are available;
- instructions for use (and cleaning) of scarf if masks are unavailable;
- soap (and ensure provision of water);
- health education messages in picture or other format appropriate to setting.

6.5.4 Home visits by health workers

It is expected that home medical visits by trained staff or community health workers will not be feasible with the anticipated case-loads and potentially limited availability of healthy staff. Mechanisms, however, should be in place for the reinforcement of health education messages in the community.

6.5.5 Management of dead bodies

- Specific plans for the respectful and culturally appropriate disposal of the deceased should be made.
- A contingency plan should be in place to handle increased numbers of dead bodies.
- A site for burials should be identified in advance.
- Body handlers and burial teams and their remuneration should also be identified.
- Standard Precautions (see section 6.4.4) must be followed when caring for the deceased patient.
- Messages regarding collection, handling and burial of bodies must be prepared in advance.
- The body should be wrapped as culturally appropriate, and leaking of body fluids should be avoided.
- The body should be sealed in a waterproof body-bag prior to transfer to the mortuary or burial site. Once the body-bag is placed inside a coffin, the coffin may be handled in the usual way.
- Transfer to the mortuary or burial site should occur as soon as possible after death.
- There is no risk to the burial team if infection-control procedures are followed (see Annex 3).
- The burial team should be provided with heavy-duty reusable boots, non-sterile ambidextrous gloves, a waterproof gown or apron, and surgical or procedure masks.
- If splashing of body fluids is anticipated, use hair cover and goggles (preferably) or visors.
- After removing PPE, hand hygiene should be performed.
- If the family of the patient wishes to view the body or participate in the burial process, they may be allowed to do so. However, the number of people should be limited as much as possible and they should observe standard and droplet precautions. Family members participating in the burial process should wear surgical or procedure masks, gloves and gowns, and perform hand hygiene afterwards.

6.6 Health messages during a pandemic

The main objective of health messages during a pandemic is to inform communities and promote appropriate risk-reduction practices to limit influenza transmission. Disease and death can only be reduced if the population adopts such practices. Key communication principles involve:

- providing the best information available in a timely and easily understood fashion;
- promoting compliance with public health measures;
- identifying and addressing inaccuracies, rumours and misperceptions quickly and working to reduce stigmatization of affected groups;
- instilling and maintaining public confidence in the health system, while at the same time conveying realistic expectations about its ability to respond.

As current evidence states that transmission of influenza occurs mainly through direct inhalation of respiratory droplets produced when people cough or sneeze, preventive respiratory etiquette should be reinforced generally (see guidance note in section 6.4.1).

Advice should be provided on social distancing behaviours and their purpose (see guidance note in section 6.4.2).

Hand hygiene should be reinforced, as evidence also suggests that contact transmission of influenza virus particles may also occur (see guidance note in section 6.4.1). All health-care workers, caregivers and patients should be provided with information, in the local language, regarding the illness and its symptoms, mode of transmission, treatment and possible consequences. Community leaders and traditional healers have a crucial role to play as messengers, particularly among populations with low literacy levels.

See *Annex 2A* for behavioural messages to reduce the risk of transmission of pandemic influenza, reduce mortality, and survive pandemic influenza; and *Annex 2B* for key health communication activities during a pandemic period.

Annex 1

Pandemic preparedness planning checklist for humanitarian agencies

General measures

Event coordination team	<ul style="list-style-type: none"> ▪ Establish an event coordination team for your programme/site that includes both health and non-health sectors and that can be activated in the event of a pandemic. This unit will include the outbreak control team (OCT) that will be responsible for detection and management of initial cases, but will have a broader remit to include: <ul style="list-style-type: none"> - coordination of essential services - implementation of public health measures - managing public health information - communications - health facility management - security.
Coordination with local and national authorities and other agencies	<ul style="list-style-type: none"> ▪ Identify agency focal point for pandemic preparedness activities at local level. ▪ Review country pandemic planning and response plan. ▪ Ensure links with ministry of health, WHO and UN country coordination mechanisms, e.g. OCHA, UNSIC for: <ul style="list-style-type: none"> - information flow; - consistency of risk communication/health education messages; - movement of specimens/diagnostic material, referral of patients.
Identification of critical functions	<ul style="list-style-type: none"> ▪ Identify critical functions that will need to continue during the pandemic (8–12 weeks) and those who will perform them (and identify non-essential functions that will be temporarily halted). ▪ Identify staff that may need to perform multiple roles.
Ensure stockpile of food, water, fuel, gas, oil for cooking, vehicles, generators	<ul style="list-style-type: none"> ▪ Ensure sufficient stockpile for population, all staff and their families. Consider 3-month stockpile and add 50% buffer stock for other populations seeking aid (i.e. 4.5 months).
Communications	<ul style="list-style-type: none"> ▪ Ensure means of communication throughout pandemic phase without physical movement to other areas.
Security for population, health-care facility (HCF) and staff	<ul style="list-style-type: none"> ▪ Ensure security at HCF to maintain triage. ▪ Ensure security of medicines, food and other supplies. ▪ Ensure security of staff. ▪ Ensure access to services by local communities not usually served.

General measures (cont.)	
Travel restrictions during pandemic phases 4–5	<ul style="list-style-type: none"> ▪ Decisions regarding phase changes will be made by WHO; further advice on travel restrictions will be issued concurrently. ▪ Ensure agreements in place for the deferral of non-essential travel. ▪ Information/advice to travellers entering affected area on risks and risk avoidance (public health information). ▪ Defer non-essential international travel to affected areas. ▪ Ensure repatriation policy for international staff.
Travellers to your area during pandemic	<ul style="list-style-type: none"> ▪ General travel restrictions are not recommended during the pandemic period. ▪ Ensure mechanism in place to provide information/advice to travellers entering the affected area on risks and risk avoidance (public health information) when the pandemic occurs.
Protection of staff	
Identification of essential staff	<ul style="list-style-type: none"> ▪ Prioritization for PPE use, vaccines and antivirals (if available). ▪ Identify back-up staff to take over tasks if illness occurs.
Management of ill staff	<ul style="list-style-type: none"> ▪ Protocols for management of ill staff. ▪ Strategy for referral/evacuation if necessary.
Repatriation/evacuation	<ul style="list-style-type: none"> ▪ Protocol for evacuation of international staff, ensuring that “medivac” contracts do not invoke exclusion clauses for new disease.
Vaccination	<ul style="list-style-type: none"> ▪ Vaccinate all essential staff with seasonal influenza vaccine.
Seasonal influenza vaccine	<ul style="list-style-type: none"> ▪ Use an H5N1 prototype vaccine (if and when available) according to prioritization protocol.
H5N1 prototype vaccine (when available)	<ul style="list-style-type: none"> ▪ Use pandemic vaccine (if and when available) according to prioritization protocol.
Pandemic vaccine	
Personal protective equipment (PPE)	<ul style="list-style-type: none"> ▪ Ensure prioritization protocol for PPE use. ▪ Ensure masks available at least for all staff working in HCFs.
Stockpiling	<ul style="list-style-type: none"> ▪ Antibiotics for secondary bacterial pneumonia, paracetamol and antivirals (if available). ▪ Ensure protocol for use.

Training of staff

Training of trainers	<ul style="list-style-type: none"> ▪ Risks and risk avoidance.
Training for direct health-care workers/community health workers	<ul style="list-style-type: none"> ▪ Public health information on hygiene behaviour. ▪ Communication/counselling skills. ▪ Surveillance case definition. ▪ Infection-control procedures. ▪ Triage case definition and management of patients. ▪ General admission criteria (depending on treatment capacity). ▪ Respiratory HCF procedures and patient flow. ▪ PPE use (when, method of placement, removal and disposal). ▪ Clinical management. ▪ Management of waste/linen/dead bodies. ▪ Fever monitoring, symptom reporting. ▪ Information management and reporting. ▪ Rapid training protocols for staff fulfilling multiple or new essential functions.

Health communication

Dissemination of information.	<ul style="list-style-type: none"> ▪ Health education to community on universal hygiene behaviour (respiratory etiquette and hand-washing); cleaning of potentially contaminated surfaces; washing of clothes/bed-linen and drying in sun.
Community outreach and liaison	<ul style="list-style-type: none"> ▪ Information to community on current risks and risk avoidance.
Rumour management	<ul style="list-style-type: none"> ▪ Information to health-care workers and staff on risks and risk avoidance. ▪ Ensure ongoing two-way communication with communities, other health facilities/agencies/ministry of health during pandemic.
Soap stockpile and distribution	<ul style="list-style-type: none"> ▪ Ensure sufficient soap for each individual for hand-washing, cleaning and clothes-washing purposes for a period of 2 months. Add 50% buffer stock.
Community alert surveillance	<ul style="list-style-type: none"> ▪ Ensure reporting by community leaders and community health workers of clusters of people with severe respiratory illness or deaths (phases 3–5) to health-care workers, authorities or camp managers as appropriate.
Social distancing measures	<ul style="list-style-type: none"> ▪ Plan for minimizing congregation at water and food distribution areas. ▪ Ensure effective communication mechanisms with community for the future postponement or minimization of large gatherings (sports events, schooling, funerals).

Health communication (cont.)

Management of dead bodies in the community

- Identify burial areas in advance.
- Identify staff for burials.
- Train body-handlers on appropriate corpse management.

PPE

- Ensure surgical or procedure masks available for providers of essential services such as health-care workers, and food- and water-handlers.
- Ensure protocol for use/disposal.

Surveillance

Surveillance and response during pandemic alert period (WHO phases 3–5)

- Application of simplified case definitions at community and HCF levels to promote:
 - Early detection of cases/clusters or deaths caused by avian influenza H5N1 or other influenza viruses of pandemic potential.
- An outbreak coordination team (OCT) should be organized to oversee:
 - Case/cluster investigation, rapid reporting to health coordinator and authorities/WHO and sample collection/transport in response to H5N1 avian influenza or other outbreaks of pandemic potential in humans, in support of national authorities and WHO as necessary.
 - Isolation of patients (and close contacts) while case investigation ongoing.
 - Infection control in HCF and use of PPE according to risk.
 - Communication to public of risk and risk avoidance, and implementation of universal hygiene behaviours.

Surveillance during pandemic (WHO phase 6)

- An OCT will be required for early detection of initial cases of a novel pandemic virus strain in refugee/displaced population settings once a pandemic starts (WHO phase 6).
- Monitor the spread of cases.
- Monitor the number of deaths.
- Monitor the number of hospitalizations.
- Monitor availability of health-care and other essential services.

Health-care facility

- Identify separate respiratory HCF.
- Identify respiratory outpatient waiting area and respiratory inpatient ward.
- Ensure capacity for surge of cases.
- Identify essential and non-essential functions.
- Ensure adequate staffing for essential services and back-up staff for absenteeism.
- Infection-control protocols.
- Clinical-management protocols.
- Staff illness and protection protocol.
- Stockpiles.

Infection control

Procedures	<ul style="list-style-type: none"> ▪ Reinforce infection-control procedures for all staff (phase 3 onwards).
Soap/alcohol handrub	<ul style="list-style-type: none"> ▪ Ensure soap/towels and alcohol handrub in HCFs. Order for 50% increase in current usage.
PPE (masks, gloves)	<ul style="list-style-type: none"> ▪ PPE protocol for staff and patients at outpatient and inpatient departments.
Respiratory HCF organization	<ul style="list-style-type: none"> ▪ Identify separate facility for admitted influenza patients. ▪ Triage definition in place for initial screening of patients. ▪ Ensure as much spatial separation between patients as possible. ▪ Criteria for admission (depending on capacity). ▪ Protocol for entry/exit of staff, visitors, support staff. ▪ PPE use and disposal protocol for staff and patients. ▪ Protocol for cooking for and supply of food to patients. ▪ Protocol for cleaning of equipment/linen used by patients. ▪ Criteria for discharge of patients (depending on capacity).
HCF overflow	<ul style="list-style-type: none"> ▪ Ensure overflow area if large numbers of patients. ▪ Maximize spatial separation between patients.

Clinical management	
<p>Management of ill individuals with suspected influenza</p> <p>(Admission, treatment and discharge protocols should be flexible, as criteria are likely to change depending on treatment capacity)</p>	<ul style="list-style-type: none"> ▪ Triage case definition in place. ▪ Triage and separation of people with respiratory symptoms from those with other symptoms. ▪ Surgical or procedure masks to be worn by all patients seeking care in respiratory HCF. ▪ Admission protocol to respiratory HCF. ▪ PPE use (when, method of placement, removal and disposal). ▪ Separation of severely ill. ▪ Case-management protocol. ▪ Patient-discharge protocol.
Management of contacts of patients	<ul style="list-style-type: none"> ▪ Self-health (daily fever and cough) monitoring and reporting if ill. ▪ Defer travel to unaffected areas.
Waste disposal	<ul style="list-style-type: none"> ▪ Plan for increased waste caused by increased turnover at HCF.
Mortuary	<ul style="list-style-type: none"> ▪ Plan for increased number of deaths. ▪ Assess/identify site for burials. ▪ Identify body-handlers and burial team. ▪ Ensure access to PPE. ▪ Ensure knowledge of modes of transmission and of standard precautions.
Referrals	<ul style="list-style-type: none"> ▪ Protocol for referrals (if feasible). ▪ Plan referral mechanism in coordination with authorities/other HCFs.
Transport/vehicles	<ul style="list-style-type: none"> ▪ Protocol for disinfection of contaminated surfaces after transporting sick individuals or contacts.
Treatment stockpiles	<ul style="list-style-type: none"> ▪ Essential medicines/supplies for usual diseases. ▪ Antibiotics (oral and IV) for secondary pneumonia. ▪ Paracetamol. ▪ IV fluids/infusion materials.

Annex 2

A. Sample health education messages during a pandemic

Health messages should propose concrete action that people can take. They should support and reinforce local public health interventions and be culturally appropriate and context-specific. Different messages may be needed for different audiences such as caregivers, health workers, community leaders, children, business people, etc. Health messages should provide the rationale for the interventions in a language and form that local communities can understand and access. It is important that health messages for specific groups are complementary and do not provide contradictory advice, as this may cause confusion and anxiety.

Messages regarding the disease itself

- Influenza, commonly known as "the flu", is a viral infection of the nose, throat and lungs. It is a highly infectious disease that may spread very quickly from person to person.
- Respiratory illnesses such as influenza are spread by:
 - coughing or sneezing;
 - unclean hands.
- Symptoms appear suddenly, beginning with headache and generally feeling unwell, followed by:
 - fever ($> 38\text{ }^{\circ}\text{C}$), dry cough, shortness of breath, difficulty breathing.
- You may also experience:
 - muscle aches and pains; tiredness; sore throat; chills.

Behavioural messages for reducing risk of transmission of pandemic

Be flu-WISE

- **W**ash: wash hands often; clean surfaces.
 - Wash hands with soap and clean water carefully and often – this kills the virus.
 - In particular, wash hands after coughing or sneezing; before and after food preparation (also clean food-preparation surfaces and utensils with soap and clean water); before and after feeding children; after using latrines; and after bathing or cleaning children.
- **I**nform yourself and others about influenza and maintain good health habits.
- **S**tay apart: keep a distance of more than 1 m away from others, especially if sick. Stay at home as much as possible; avoid public gatherings, avoid travel.
 - The virus is spread by close contact (usually within 1 m) with a person with respiratory symptoms; the more people that you contact, the greater the chances of becoming infected.
 - The infection can pass quickly from person to person when there are many people in close contact with each other, so these situations must be avoided.
- **E**tiquette: cover coughs and sneezes (mask, tissue or elbow, but not hands); do not spit in public; if using masks (or scarves), dispose of them (or wash them with soap and water and dry in the sun).

- When people cough or sneeze, droplets containing the virus are sprayed into the air. Covering the mouth and nose with a tightly-fitting mask, scarf or cloth when in close contact with others can limit spread of disease.
- Do not cough or sneeze into your hands as this will spread the disease when you touch other people or surfaces. Always wash hands after coughing or sneezing.

Behavioural messages for reducing mortality and surviving pandemic influenza

Practise flu-CARE

- **C**are for the patient at home; minimize number of caregivers to avoid exposing other members of the family to the virus.
- **A**ssess and improve your knowledge on how to care for yourself and others.
 - If you are a caregiver, protect yourself when caring for sick people. Cover your nose and mouth when caring for the sick person, and wash your hands with soap and water after every visit. Also, if you are a caregiver, avoid contact with people who are not ill for the length of time the patient is infectious (as instructed by the health-care worker).
 - Avoid contact with secretions of people who have respiratory illnesses.
- **R**est as soon as symptoms develop, and stay home.
 - Stay away from others if you are sick; avoid contact with others as much as possible until your respiratory symptoms have resolved.
 - Medicine against fever, fluids and food are important.
- **E**valuate for danger signs and act in accordance with latest information.
 - Look out for shortness of breath or difficulty breathing – you may need to seek health advice.

B. Proposed public health communication activities for different pandemic phases

PHASES	PUBLIC HEALTH COMMUNICATION ACTIONS
Pandemic alert period	“Watch out!” and then when phase 4 begins: “We’re here to help”
<p><i>Phase 3</i></p> <p>Human infection(s) with a new subtype, but no human-to-human spread, or at most rare instances of spread to a close contact.</p>	<ul style="list-style-type: none"> ▪ Map risk behaviours among target groups e.g. backyard farmers, poultry workers, children. ▪ Gather "word on the street" survey data, other research data (meetings, focus groups, etc.). ▪ Develop consensual recommendations by experts and first responders. ▪ Build trust by providing full, factual and transparent information about the national and global threat and response to communities. ▪ Strengthen public education and social mobilization alliances and networks including local NGOs, Red Cross/Crescent societies, trade associations, schools. ▪ Strengthen community surveillance and appropriate health-seeking behaviour. ▪ Develop messages and test messages for subsequent phases. ▪ Increase general public understanding of risk. ▪ Prepare public for the possibility of an adverse event. ▪ Educate health-care workers, teachers, community leaders, politicians. ▪ Encourage recognition and diagnosis of symptoms and early treatment.
<p><i>Phase 4</i></p> <p>Small cluster(s) with limited human-to-human transmission, but spread is highly localized.</p>	<ul style="list-style-type: none"> ▪ Use tested messages targeting rural or highly urban communities. ▪ Convey empathy and reassurance, and reduce emotional turmoil.
<p><i>Phase 5</i></p> <p>Larger cluster(s) but human-to-human spread still localized, suggesting that the virus is becoming increasingly better adapted to humans, but may not yet be fully transmissible (substantial pandemic risk).</p>	<ul style="list-style-type: none"> ▪ Reduce stigma, discrimination and isolation associated with affected patients, families, communities. ▪ Ensure understanding of personal response activities (how/where to get more information, e.g. home care). ▪ Address fear of shortages of antivirals and vaccines.

Pandemic period

“We’ll get through this”

Phase 6

Pandemic: increased and sustained transmission in general population.

- Gather data concerning public perception of ongoing risks.
- Promote understanding of background factors and issues.
- Promote broad-based support and cooperation with response and recovery efforts.
- Ensure that feedback mechanisms are in place to assess input from the affected public, and correct any misunderstandings/rumours.
- Maintain understanding of personal response activities (how/where to get more information, e.g. home care).

Post-pandemic period

“This is what happened” and then: “How did we do?”

Return to inter-pandemic period.

- Facilitate broad-based, honest and open dialogue with community and resolution of issues regarding cause, blame, responsibility and adequacy of response.
- Improve public understanding of new risks as well as new risk-avoidance behaviours and response procedures.
- Evaluate and assess responses, including public education and social mobilization effectiveness.
- Document, formalize and communicate lessons learnt.
- Determine specific actions to improve public education and social mobilization capability.

Adapted from: Reynolds B, Seeger MW (2005). Crisis and emergency risk communication as an integrative model. *Journal of Health Communication*, 10:43–55.

Annex 3

Infection-control procedures in health-care settings

1. Inpatient ward management

Patient separation

- Patients should be kept separately in designated multi-bed rooms or wards.
- The distance between beds should be more than 1 m and beds should preferably be separated by a physical barrier (e.g. partition).
- If achieving 1 m separation between beds is not feasible, beds should have alternating head-to-toe positioning to maximize the distance between the heads of patients.
- A surgical or procedure mask should be worn by all caregivers/staff when in close contact (i.e. < 1 m away) with any patients. Masks are not necessary if not in close contact with patients.
- If sufficient stocks exist, surgical/procedure masks are also recommended for patients when they are in close contact with others. This may not always be feasible (e.g. when the patient is on oxygen therapy) and thus patients must be encouraged to cover coughs/sneezes with a cloth or to cough/sneeze into their sleeve at all times.
- Movement and transport of patients from the room should be limited to essential purposes only. If transport is necessary, patients should wear a surgical or procedure mask when outside their room/area.
- Protocols for visitation by close relatives should be in place, and surgical or procedure masks made available for their use.
- Inpatient wards should have clinical equipment (e.g. sphygmomanometer, thermometer) dedicated to their exclusive use if possible. If not, disinfection with alcohol-based disinfectant should be carried out between patients.
- Patient examination must be minimized to such that will alter treatment only.

Entry to/exit from respiratory inpatient ward

- Minimize contact between health-care workers and patients as much as possible.
- Only clinical workers who have been educated about influenza should enter the room.
- Ensure that anyone who enters the ward wears appropriate PPE (mask and goggle/visor) if close contact with patients is anticipated.
- If contact with the patient's blood, body fluids/secretions is anticipated, also wear clean, non-sterile gloves and gown (plastic apron if gown is permeable) when entering the room.

Entering the respiratory inpatient ward

- Collect all equipment needed.
- PPE should be put on (and removed) outside the isolation room (see diagrams below for putting on PPE).
- Enter the room.

Leaving the respiratory inpatient ward

If only masks and goggles/visors are used (close contact but no aerosol-generating procedures performed):

- Remove eyewear (goggle/visor) – do not touch front of goggles – and place in biohazard plastic bag for disinfection and reuse.

- Remove masks by grasping elastic behind ears or ties – do not touch front of mask – and place in biohazard plastic bag; perform hand hygiene.

If several PPE items are used (e.g. performing aerosol-generating procedures):

- Remove PPE in the correct order (see diagrams below for removing PPE).
- Remove gloves (peel from hand and discard into biohazard plastic bag).
- Remove gown (place in biohazard plastic bag). Gloves and gowns may be removed at the same time.
- Use alcohol-based handrub or wash hands.
- Remove eyewear (goggles) – do not touch front of goggles – and place in biohazard plastic bag for disinfection and reuse.
- Remove mask – by grasping elastic behind ears or ties – do not touch front of mask – and placing in biohazard plastic bag.
- Use alcohol-based handrub or wash hands again.

Hand hygiene

Each individual having direct contact with (touching) patients must perform hand hygiene:

- before and after patient contact
- after removing gloves
- in case of suspicion of hand contamination after removing gloves, e.g. while undressing
- after leaving the respiratory inpatient ward.

Routine hand antisepsis is performed either:

- by using preferably an alcoholic handrub solution if hands are not visibly soiled; or
- washing hands with running water and soap, using a single-use clean towel for drying each time.

Ensure that hand-eye contact is not made (e.g. wiping of sweat) as transmission can occur via conjunctival mucosa.

Cleaning/waste disposal

- Alcohol-based hand-rub or hand-washing facilities should be located within and outside the isolation ward.
- Reusable items should be placed in a closed recipient or plastic bag.
- The respiratory inpatient ward must be cleaned each day – including all horizontal surfaces.
- Cleaning equipment must be cleaned after each use. Mop-heads should be laundered in hot water (at least 70 °C). If hot water is not available, soak mop-heads in 0.5% chlorine solution for approximately 15 minutes after washing.
- Used linen should be placed in a linen bag inside the room. Take immediately to laundry collection area – treat as normal soiled/contaminated linen.
- All waste should be discarded into a clinical waste-bag inside the room. When waste is to be collected for disposal, treat as “normal” clinical/contaminated/infectious waste.

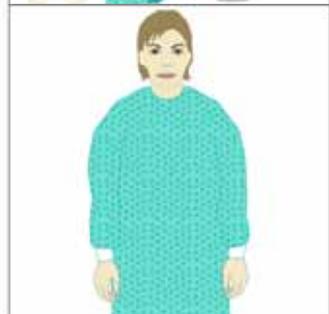
Discharging the patient

- Infection-control precautions should be implemented for:
 - 7 days after resolution of fever for adults (aged > 12 years);
 - 21 days after onset of illness for children (aged < 12 years).

- The patient and family should be given appropriate health education messages.
- Thorough cleaning and disinfection of the bed and room is required after discharge.

2. Putting on and removing PPE

Putting on PPE (when all PPE items are needed)



Identify hazards and manage risk. Gather the necessary PPE.

Plan where to put on and take off PPE.

Have you identified a back-up person? Do you have a mirror?

Do you know how you will deal with waste?

Put on a gown

Put on particulate respirator or surgical/procedure mask; perform user seal check if using a respirator mask (see below).

Put on eye protection e.g. goggles (consider anti-fog drops or fog-resistant goggles). Caps are optional: if worn, put on after eye protection.

Put on gloves (over cuff)

Taking off PPE

Avoid contamination of self, others and the environment.

Remove the most heavily contaminated items

Remove gloves and gown: peel off gown and gloves and roll from inside, out.

Dispose of gloves and gown safely.

Perform hand hygiene

Remove cap (if worn).

Remove goggles from behind.

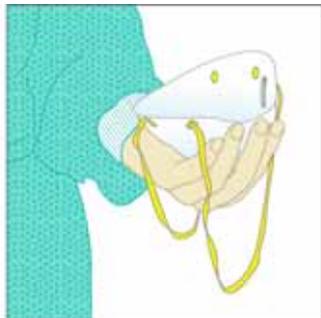
Put goggles in a separate container for reprocessing.

Remove mask from behind

Perform hand hygiene



Sequence of a particulate respirator mask seal check



1. Cup the respirator mask in your hand with the nosepiece at your fingertips, allowing the headbands to hang freely below your hand.



2. Position the respirator under your chin with the nosepiece up.



3. Pull the top strap over your head resting it high at the back of your head. Pull the bottom strap over your head and position it around the neck below the ears.



4. Place fingertips of both hands at the top of the metal nosepiece. Mould the nosepiece (USING TWO FINGERS OF EACH HAND) to the shape of your nose. Pinching the nosepiece using one hand may result in less effective respirator performance.



5. Cover the front of the respirator mask with both hands, being careful not to disturb the position of mask.

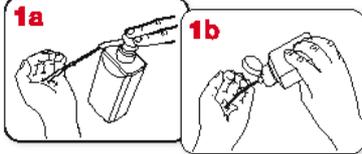
Positive seal check

Exhale sharply. A positive pressure inside the respirator = no leakage out from the sides of the mask. If leakage, adjust position and/or tension straps. Retest the seal. Repeat the steps until respirator is sealed properly.

Negative seal check

Inhale deeply. If no leakage, negative pressure will make respirator cling to your face. Leakage will result in loss of negative pressure in the respirator due to air entering through gaps in the seal.

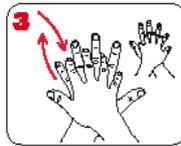
How to handrub? WITH ALCOHOL-BASED FORMULATION



Apply a palmful of the product in a cupped hand, covering all surfaces.



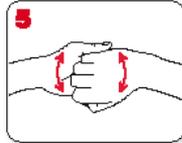
Rub hands palm to palm,



right palm over left dorsum with interlaced fingers and vice versa,



palm to palm with interlaced fingers,



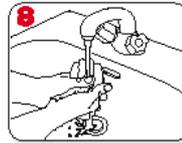
backs of fingers to opposing palms with fingers interlocked,



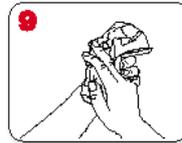
rotational rubbing of left thumb clasped in right palm and vice versa,



rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa.



rinse hands with water,



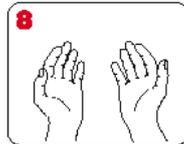
dry hands thoroughly with a single use towel,



use towel to turn off faucet.



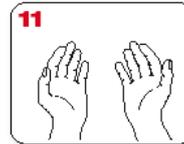
20-30 sec



Once dry, your hands are safe.



40-60 sec



Your hands are now safe.

WORLD ALLIANCE
for **PATIENT SAFETY**

WHO acknowledges the Hôpitaux Universitaires de Genève (HUG), in particular the members of the Infection Control Programme, for their active participation in developing this material.
October 2006, version 1.



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Annex 4

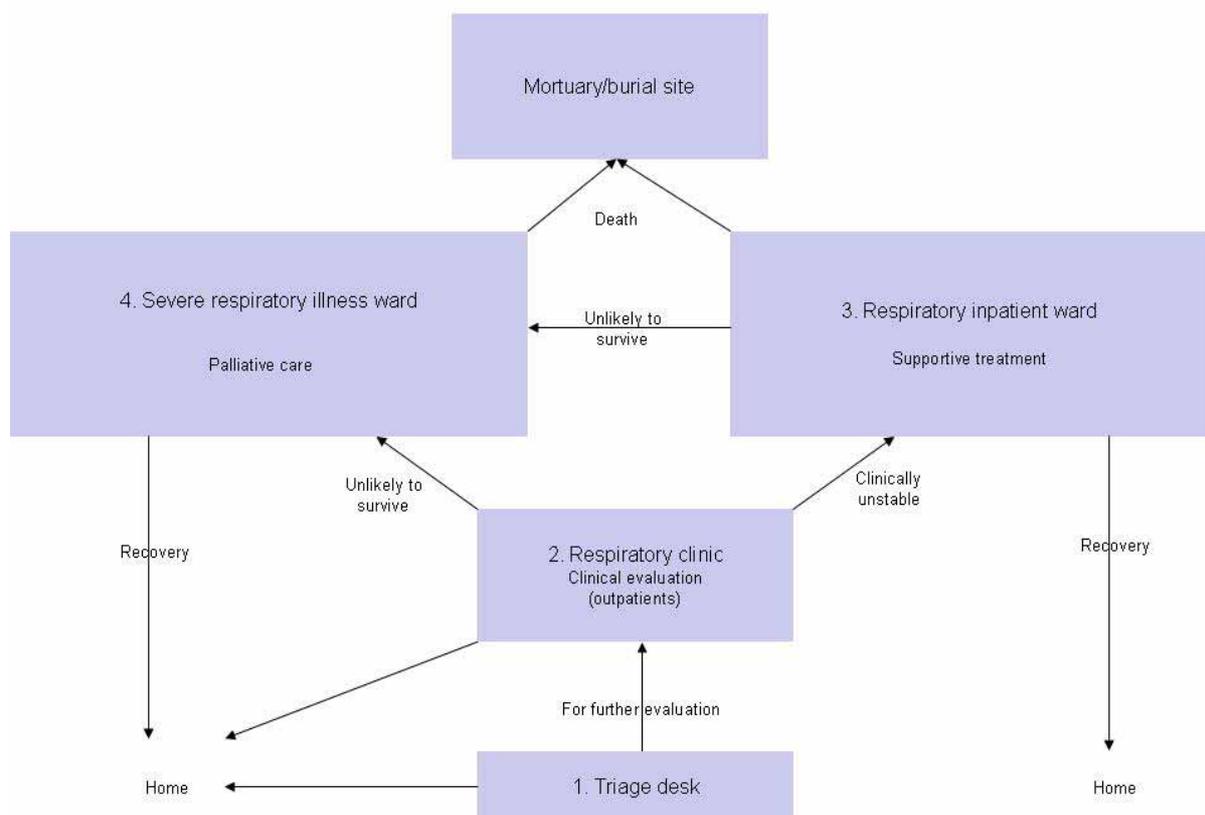
Sample configuration: respiratory health-care facility

The schematic presentation shown below represents a sample configuration to be used for guidance when planning the layout of the respiratory health-care facility (HCF) and associated patient flow during a pandemic.

The following principles should be observed:

- The function of an HCF will need to change to adapt to the increased flow of patients.
- A separate respiratory facility is ideal, e.g. a series of tents may be erected for this purpose.
- Treatment efforts should be focused on those most likely to survive, i.e. triage.
- A pre-agreed protocol for triage should be in place; this should allow a strict separation of symptomatic and non-symptomatic patients, while more efficiently distributing scarce resources.
- Movement between areas within the HCF is based on clinical determinations made by providers on the scene.
- All staff should wear masks when in close contact (< 1 m) with patients; all patients should wear masks when outside the respiratory inpatient ward and when in close contact with others.

Respiratory health-care facility layout, with proposed patient flow



The respiratory HCF should have four separate areas:

1. **Triage desk:** to determine the need for further evaluation/treatment.
 - Triage definition: fever ≥ 38 °C + acute onset of cough or shortness of breath.
 - Those meeting the triage definition should be given surgical or procedure masks and taken to the respiratory clinic for further assessment.
2. **Respiratory clinic:** to further evaluate those with fever and acute respiratory illness.
 - Those clinically stable should be discharged home.
 - Those clinically unstable should be admitted to the respiratory inpatient ward for further treatment.
 - Severely-ill patients (imminent death likely) should go immediately to the severe respiratory illness ward.
3. **Respiratory inpatient ward:** to provide supportive care (fluid resuscitation, antibiotic treatment, etc.) to those patients likely to benefit sufficiently to allow recovery.
4. **Severe respiratory illness ward:** to provide a place for palliative care.

Annex 5

Disinfectants active against human influenza virus for use in health-care facilities

Disinfectant	Recommended Use	Precautions
Sodium hypochlorite		
<p>Most household bleach solutions contain 5% sodium hypochlorite (50 000 parts per million [ppm] available chlorine).</p> <p><i>Rationale</i></p> <p>If the initial concentration of the bleach is 5%, 1 part bleach needs to be diluted with 99 parts water to give the final required concentration of 0.05%. Some constant method to measure 99 parts of water and 1 part bleach must be used or underdilution (bleach is too strong) or overdilution (bleach is too weak) may occur.</p> <p><i>Example of how to dilute bleach</i></p> <p>Use spoons, cups, glasses, or other utensils commonly available in the community or the bottle cover (of the bleach) as a measuring tool. Let's assume a spoon is the measure of "1 part". Using the same spoon, count the number of spoonfuls of water needed to fill a cup. This will show how many "parts" a cup contains. Let's say the cup contains 48 parts water (i.e. it took 48 spoonfuls to fill the cup). Therefore 2 cups of water will equal 96 parts of water. So 99 parts will need 2 cups of water plus 3 further spoons of water. This quantity of water then mixed with one spoon of bleach gives approximately the right dilution of 99 parts water to 1 part bleach.</p>	<p>Disinfection of material/surfaces contaminated with blood and body fluids</p> <p><i>Recommended available chlorine required</i></p> <p>0.05% or 500 ppm available chlorine.</p> <p><i>Recommended dilution</i></p> <p>1:100 dilution of 5% sodium hypochlorite is the usual recommendation. To get a 1:100 dilution, use 1 part bleach to 99 parts cold tap-water.</p> <p>Adjust ratio of bleach to water as needed to achieve appropriate concentration of sodium hypochlorite, e.g. for bleach preparations containing 2.5% sodium hypochlorite, use twice as much bleach (i.e. 2 parts bleach to 98 parts water).</p> <p><i>Contact times for different uses</i></p> <p>Disinfection by wiping of nonporous surfaces: a contact time of ≥ 10 min is recommended. Disinfection by immersion of items: a contact time of 30 min is recommended.</p>	<p>Irritates mucous membranes, the skin and the airways, decomposes under heat and light, and reacts readily with other chemicals.</p> <p>Mix and use in well-ventilated areas.</p> <p>Protective clothing required while mixing, handling and using bleach (mask, rubber gloves and waterproof apron). Goggles are also recommended to protect the eyes from splashes.</p> <p>Mix bleach with cold water because hot water decomposes the sodium hypochlorite and renders it ineffective.</p> <p>Do not mix with strong acids to avoid release of chlorine gas.</p> <p>Corrosive to metals.</p> <p>Surfaces must be cleaned of organic materials such as secretions, mucus, vomit, faeces, blood or other body fluids before disinfection or immersion.</p>

Alcohol

For example isopropyl 70%, ethyl alcohol 60%.

Small surfaces (e.g. rubber stoppers of multiple-dose medication vials and thermometers) and occasionally external surfaces of equipment (e.g. stethoscopes and ventilators)

Flammable, toxic, to be used in well-ventilated areas and only on small surfaces, avoid inhalation.

Keep away from heat sources, electrical equipment, flames, hot surfaces.

Allow it to dry completely, particularly when using diathermy, as this may cause burns.

May cause discoloration, swelling, hardening and cracking of rubber and certain plastics after prolonged and repeated use.

Source: Infection prevention and control of epidemic- and pandemic-prone acute respiratory diseases in health care (ref. 1).

Annex 6

1. Sample calculations for pre-positioning of supplies

Indicators	Estimates for crowded, low-resource settings
Attack rate	Up to 50–60% (in the general population)
Secondary bacterial pneumonia	5–10% (50% of the 10–20% who develop any pneumonia of those ill)
Health-care seeking - outpatients	30–50% (of those ill)
Hospitalization rate - inpatients	Up to 10% (of those ill)
Case-fatality ratio	4% or more (of those ill)

The following is a tabulated summary for the calculation of minimum stockpiles for pre-positioning, based on the above estimates.

Sample population = 10 000.

	Within 2–3 months	Per day
Ill from influenza	Up to 5000–6000	56–100
Secondary bacterial pneumonia	250–600	3–10
Health-care seeking for influenza (outpatients)	1500–3000	17–50
Severe cases of influenza (inpatients)	500–600	6–10
Deaths from influenza (includes community and health facilities)	200–240	2–4 or more

2. Supply checklist for pre-positioning

- ✓ Masks – surgical or procedure masks
- ✓ Masks – particulate respirators (e.g. NIOSH-certified N95, EU FFP2 or equivalent masks)
- ✓ Gloves – latex, examination gloves, single-use, non-sterile for clinical use (sizes: S, M, L)
- ✓ Protective eyewear if possible (face shield)
- ✓ Hand-washing soap or hand-disinfectant/alcohol-based gels
- ✓ Gowns (plastic apron, disposable)
- ✓ Biohazard plastic bags for used personal protective equipment
- ✓ Boxes for sharp objects
- ✓ Disinfectants for health-care setting (see Annex 5)
- ✓ Rubber gloves and boots (reusable) for environmental cleaning and burial teams
- ✓ Stretchers, body-bags for burial teams
- ✓ Antiviral medications (oseltamivir 75 mg, see below)
- ✓ Antibiotic medications (see below)
- ✓ Intravenous fluids/cannulae/giving sets (see below)

3. Example of supply costs

Description/protective equipment	Unit	Approx. cost US\$/unit
Procedure masks	Box of 50	7.25
Handwash, alcoholic, antiseptic and skin-protection solution	Bottle	4.00
Latex gloves, size S, M or L, box of 50 pairs, non-sterile, disposable (e.g. examination gloves)	Box	2.25
Plastic aprons, disposable, standard size	Box	Variable
Rubbish plastic bag, roll of 100 pieces	Roll	3.00
Rubber gloves, acid-resistant, reusable, sizes 7, 8, 9	Pairs	4.00
Rubber boots, reusable, different sizes	Pairs	10.00

4. Approximate calculation of mask requirements

Sample population = 10 000.

- Anticipate 1500–3000 people seeking health care at outpatient facilities for influenza only over the course of the first wave of the pandemic.
- Anticipate 500–600 inpatient admissions.
- Masks for patients presenting for evaluation = 1500–3000.
- Masks for inpatients = number of inpatients estimated at 500–600, one mask per day, x duration of stay of 7 days = 3500–4200.
- Masks for health-care workers (HCWs):
 - 6–10 mask changes per day x duration (in days) of pandemic (? 90 days) (+ 50% buffer stock).
 - = 810–1350 masks per HCW.
- Masks for other potentially exposed staff, such as food- and water-handlers, cleaners, security guards:
 - 2–4 mask changes per day x duration of pandemic (? 90 days) (+ 50% buffer stock).
 - = 270–540 masks per non-HCW staff.
 -

Summary of key indices	Numbers required for sample population of 10 000
Masks for outpatients	1500–3000
Masks for inpatients	3500–4200
Masks per HCW	810–1350
Masks per other potentially-exposed staff	270–540

5. Examples of particulate respirators

Particulate respirators (e.g. NIOSH-certified N95, EU FFP2 or equivalent masks) are filtering face-pieces designed to protect the wearer from respiratory aerosols expelled by others, regardless of particle size. Examples of acceptable disposable particulate respirators in various parts of the world include:

- U.S. NIOSH-certified N95 (95%), N99 (99%), N100 (99.7%)
- Australia/New Zealand: P2 (94%), P3 (99.95%)
- China: II (95%), I (99%)
- Japan: 2nd class (95%), 3rd class (99.9%)
- Republic of Korea: 1st class (94%), special (99.95%)
- European Union CE-certified: filtering face piece class 2 (FFP2)(95%), or class 3 (FFP3) (99.7%).

6. Antivirals, inpatient supplies over 2-3 month period

Action	Quantity	Formulation	Cost of 1 course (US\$)
Oseltamivir (for treatment)	A 5-day course for 15–35% of staff. Increase by 10% for a buffer (2 pills per day).	Pack of 10 capsules	16.4
Oseltamivir (for prophylaxis)	Prophylaxis for 100% of staff, for (average of) 6 weeks (1 pill per day).	Pack of 10 capsules	16.4
IV fluids (Ringer lactate) and giving sets	Anticipate 500–600 inpatient admissions. Average 3 litres/admission = 1500–1800 litres. Average 3 giving sets/admission = 1500–1800 giving sets.	Ringer lactate = 1-litre bags	Variable depending on source
IV cannulae, various gauges	Anticipate 500–600 inpatient admissions. Average 2 cannulae per day = 1000–1200 cannulae.	Gauges 14, 16, 18, 20, 22	Variable depending on source
Needles for injection	Anticipate 500–600 inpatient admissions. Assume all need injectables if hospitalized. Average 2 needles per day = 1000–1200 needles.	Gauge 21	Variable depending on source
Paracetamol	Anticipate 500–600 inpatient admissions (and 3500 outpatient consultations). Anticipate 20 tablets per patient. Total 82 000 tablets.	500 mg	Variable depending on source
Stationery for records/notes	Up to 3500 seeking care at outpatient department, up to 600 admissions. Case notes, laboratory/referral forms.		Variable depending on source

7. Clinical care kit

(To be updated as more epidemiological information becomes available)

Recommended antibiotics will depend on the type of bacteria causing the pneumonia and their local antibiotic resistance patterns. Data from past pandemics show that most secondary bacterial pneumonia was caused by Gram-positive cocci such as *Streptococcus pneumoniae* followed by *Staphylococcus aureus*, and sometimes by Gram-negative rods such as *Haemophilus influenzae*.

Antibiotics suggested in this case include:

- first-line (oral): beta-lactams such as amoxicillin or amoxicillin/clavulanic acid; or macrolides such as erythromycin;
- first-line (parenteral): beta-lactams such as ampicillin;
- second-line (parenteral): third-generation cephalosporin such as ceftriaxone.

Secondary bacterial infections are estimated at 500–1000 people in population of 10 000 over a 2–3 month period.

Potential antibiotics	Dosage
Amoxicillin PO	Capsule or tablet: 250 mg; 500 mg (anhydrous). ADULT and CHILD aged > 12 years: 250 mg every 8 hours, doubled in severe infections. CHILD aged < 1 year: 20 mg/kg daily in 3 divided doses; 1–6 years: 125 mg every 8 hours; CHILD 6–12 years: 250 mg every 8 hours.
Amoxicillin + clavulanic acid PO	Tablet: 500 mg + 125 mg ADULT and CHILD > 40kg: one tablet every 12 hours.
Erythromycin PO	Capsule or tablet: 250 mg (as stearate or ethylsuccinate). ADULT and CHILD aged > 8 years: 250–500 mg every 6 hours; up to 4 g daily in severe infections; CHILD aged > 2 years: 125 mg every 6 hours, doubled in severe infections; CHILD aged 2–8 years: 250 mg every 6 hours, doubled in severe infections.
Ampicillin IV/IM	Powder for injection: 500 mg, 1 g (as sodium salt) in vial; mixed with 2.1 ml sterile water to give 500 mg/2.5 ml. ADULT : 1 g every 6 hours. CHILD : 50 mg/kg every 6 hours.* *Neonates in the first week of life: give this dose every 12 hours; in the second through fourth weeks of life, every 8 hours.
Ceftriaxone IV/IM	Powder for injection: 250 mg, 1 g (as sodium salt) in vial: mixed with 9.6 ml sterile water to give 1g/10 ml. ADULT : 1 g daily; severe infections 2–4 g daily. Infant and CHILD under 50 kg: 20–50 mg/kg daily; up to 80 mg/kg daily in severe infections (doses of 50 mg/kg and over by intravenous infusion only); by intravenous infusion (over 60 minutes). Neonates: 20–50 mg/kg daily (maximum 50 mg/kg daily).

Annex 7

Advice on use of antivirals

Recommendations for antiviral treatment and prophylaxis during a pandemic are currently based on data from seasonal influenza and avian influenza A(H5N1).

Pending the availability of vaccines, several antiviral drugs are expected to be useful for treatment purposes or for prophylaxis (prevention of illness). Two drugs in the *neuraminidase inhibitor* class, oseltamivir (commercially known as Tamiflu) and zanamivir (commercially known as Relenza), have been shown in laboratory studies to reduce the severity and duration of illness caused by seasonal influenza. For cases of human infection with H5N1, the drugs may reduce the severity of disease and improve the prospects of survival if administered early, but clinical data are limited. The H5N1 virus is expected to be susceptible to the neuraminidase inhibitors.

Another class of antiviral drugs, the *M2 inhibitors*, amantadine and rimantadine, might potentially be used against pandemic influenza, but resistance to these drugs may develop rapidly and this would limit their effectiveness. Some currently circulating avian H5N1 strains are fully resistant to the M2 inhibitors, while others remain fully susceptible.

1. Treatment during a pandemic

Options

- Ill persons
- Exposed persons for whom influenza vaccination is contraindicated.

Where neuraminidase inhibitors are available

- Oseltamivir remains the primary recommended antiviral treatment for adults, pregnant women and children during an influenza pandemic.
- Modified regimens of oseltamivir treatment, including twofold higher dosage (i.e. 150 mg twice daily for adults), longer duration and possibly combination therapy with amantadine or rimantadine (if the virus is likely to be susceptible to adamantanes) may be considered on a case-by-case basis, especially in patients with pneumonia or progressive disease.
- Zanamivir may be used for treatment of influenza but is not as strongly recommended as oseltamivir owing to potentially more adverse effects and the need to use a diskhaler device.
- Clinicians should not administer amantadine or rimantadine alone as a first-line treatment.

*Where neuraminidase inhibitors are **not** available*

If neuraminidase inhibitors are not available, therapy with amantadine or rimantadine may be tried if the virus is likely to be susceptible (consult WHO guidance at the time).

2. Prophylaxis

Options

- Long-term prophylaxis (prevention) of defined populations for the duration of a pandemic wave of activity (minimum of 4 weeks).
- Protection of individuals for the period between vaccination and the development of protection (could range from 2–6 weeks depending on whether one or two doses of vaccine are recommended).
- Prophylaxis of individuals following exposure to pandemic influenza (approximately one week per course).

Where neuraminidase inhibitors are available

- Oseltamivir and zanamivir are both recommended for chemoprophylaxis in moderate-to-high risk exposure groups (close household contact or health-care personnel with unprotected close contact with patients), including in pregnant women.
- Administration of chemoprophylaxis should begin as soon as possible after unprotected exposure and be used daily for 7–10 days after the last known exposure. Oseltamivir has been used safely for as long as 8 weeks for chemoprophylaxis of seasonal influenza.
- The dose of oseltamivir and zanamivir should be that used in seasonal influenza.
- Zanamivir might be a reasonable choice for health-care workers with a high-risk exposure to an oseltamivir-treated patient.
- Currently, there is no evidence to support an increase in prophylactic dose or duration of use of these drugs. If the contact already has fever or other symptoms suggestive of influenza infection, then full therapeutic doses of the neuraminidase inhibitors should be administered.

*Where neuraminidase inhibitors are **not** available*

- If neuraminidase inhibitors are not available and especially if the virus is known or likely to be susceptible, amantadine or rimantidine may be administered as chemoprophylaxis.
- Amantadine should not be given to pregnant women, the elderly, people with impaired renal function, and individuals receiving neuropsychiatric medication, or with neuropsychiatric or seizure disorders. Rimantidine should not be given to pregnant women.

3. Antiviral dosage regimen

Oseltamivir

For treatment of influenza:

- Adults: 75 mg twice daily.
- Children aged 1 year or older: weight-adjusted doses:
 - 30 mg twice daily for ≤ 15 kg
 - 45 mg twice daily for > 15 to 23 kg
 - 60 mg twice daily for > 23 to 40 kg
 - 75 mg twice daily for > 40 kg.
- Children aged up to 1 year: not recommended.

- Total duration of treatment is 5 days; severely-ill patients may benefit from 7–10 days of treatment.

For prevention of influenza:

- Adults and teenagers aged 13 years or older: 75 mg once daily.
- Children aged from 1 to 13 years:
 - 30 mg once daily for ≤ 15 kg
 - 45 mg once daily for > 15 –23 kg
 - 60 mg once daily for > 23 –40 kg
 - 75 mg once daily for > 40 kg.
- Children aged up to 1 year: not recommended.
- Total duration of therapy should be at least 7 days from the last day of a potentially infective exposure.

Zanamivir

For treatment of influenza:

- Adults and children over 6 years: 10 mg (2 inhalations) twice daily.
- Children 6 years and younger: not recommended for treatment.
- Total duration: 5 days.

For prevention of influenza:

- Adults and children 5 years and older: 10 mg (2 inhalations) once daily.
- Children 4 years and younger: not recommended.

Amantidine

For treatment and prevention of influenza, doses are the same:

- Adults over 65 years: ≤ 100 mg/day.
- Adults 64 years or younger: 100 mg twice daily.
- Children 10 years and over: 100 mg twice daily.
- Children 1–9 years : 5 mg/kg/day up to 150 mg in two divided doses.
- Children aged up to 1 year: not recommended.
- Treatment: total duration of 5 days.
- Prevention: total duration of therapy should be at least 7 days from the last day of a potentially infective exposure.

Rimantidine

For treatment of influenza:

- Adults over 65 years: 100 mg once daily.
- Adults 64 years or younger and children 13 years or older: 100 mg twice daily.
- Children 12 years and below: not licensed.

For prevention of influenza:

- Adults over 65 years: 100 mg once daily.
- Adults 64 years or younger and children 10 years or older: 100 mg twice daily.

- Children 1–9 years: 5 mg/kg per day up to 150 mg in two divided doses.
- Children aged up to 1 year: not recommended.

This advice will be reviewed regularly and updated as information becomes available. It is issued without any warranty of any kind, either express or implied. In no event shall WHO be liable for damages of any nature arising from the use of this advice.

Sources: WHO rapid advice guidelines for pharmacological management of sporadic human infection with avian influenza A(H5N1) virus (ref. 2).
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Glossary

Attack rate. Frequently used measure of morbidity computing the number of new cases of a specific disease reported during an epidemic period as compared with the total population at the start of an epidemic period.

Consolidated appeals process (CAP). Process to strengthen the coordination of humanitarian emergency assistance of the United Nations. It serves a twofold purpose: (i) an inclusive and joint strategic planning, monitoring and reviewing mechanism, based on an objective assessment of humanitarian needs (the CHAP); (ii) a fundraising exercise using project proposals based on the CHAP and monitored by the financial tracking system, a service provided by the United Nations Office for the Coordination of Humanitarian Affairs (OCHA). Countries/territories under the CAP in 2006 included: Benin, Burkina Faso, Burundi, Central African Republic, Chad, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Nepal, Rwanda, Senegal, Sierra Leone, Somalia, Sudan, Togo, Uganda, United Republic of Tanzania, West Bank and Gaza Strip, and Zimbabwe.

Containment. Specialized handling of highly pathogenic substances requiring highly-trained staff and specially-equipped laboratories operating at a very high level of biosecurity.

[The WHO] containment or rapid operations strategy. WHO may attempt activities to control or delay the spread of the virus if there is timely detection of cases suspected of having been transmitted from human to human during WHO pandemic phases 3–5. Modelling studies have indicated that a rapid response to initial cases using antivirals, isolation and quarantine may allow at least a delay in the spread of the virus. This delay could allow more time for production of vaccine, and for other control measures to be put in place. A strategy of this sort has never been attempted, and the obstacles to its successful implementation are formidable.

Clinical management. Effective and safe treatment of (suspected) human cases within health-care facilities. It is very important that clinical guidelines are developed in advance. Staff must be made aware of admission criteria, appropriate specimen collection and updated treatment protocols, and trained in infection-control measures.

Early warning disease surveillance. Systematic collection, analysis and interpretation of broadly categorized information for quick detection and control of diseases of immediate public health concern. A sensitive early warning system is needed to detect the first sign of changes in the behaviour of the influenza virus.

Epidemic. An increase, often sudden, in cases of the disease above what is normally expected in that population in that area. Outbreak has the same definition as epidemic, but is often used for a more limited geographical area.

Endemic. Constant presence and/or usual prevalence of a disease or infectious agent in a population within a geographical area.

Health education. Any combination of learning experiences designed to facilitate voluntary actions conducive to optimal health for the individual or community.

Health promotion. The process of enabling people to increase control over, and to improve, their health and its determinants. Health promotion strategies are not limited to a specific health problem, or to a specific set of behaviours.

Infection control. Activities implemented at different levels to effect the interruption of transmission of pathogens through measures of hygiene. Standard and droplet precautions are recommended to prevent influenza transmission in a health-care facility.

Standard precautions synthesize the major features of blood and body-fluid precautions, designed to reduce the risk of transmission of bloodborne pathogens, and body-substance isolation, designed to reduce the risk of transmission of pathogens from moist body substances, and apply them to all patients receiving care in hospitals, regardless of their diagnosis or presumed infection status. Standard precautions apply to (i) blood; (ii) all body fluids, secretions and excretions except sweat, regardless of whether or not they contain visible blood; (iii) non-intact skin; and (iv) mucous membranes. Standard precautions are designed to reduce the risk of transmission of microorganisms from both recognized and unrecognized sources of infection in hospitals.

Droplet precautions are designed to reduce the risk of droplet transmission of infectious agents. Droplet transmission involves contact of the conjunctivae or the mucous membranes of the nose or mouth of a susceptible person with large-particle droplets (larger than 5 μm) containing microorganisms generated from a person who has a clinical disease or who is a carrier of the microorganism. Transmission via large-particle droplets requires close contact between source and recipient individuals, because droplets do not remain suspended in the air and generally travel only short distances (usually 1 m or less) through the air. Droplet precautions apply to any patient known or suspected to be infected with epidemiologically important pathogens that can be transmitted by infectious droplets.

Influenza. An acute viral disease of the respiratory tract characterized by fever, coryza, sore throat, cough and myalgia. Cough is often severe and protracted, but other manifestations are usually self-limited, with recovery within 2–7 days. Influenza derives its importance from the rapidity with which epidemics evolve, the widespread morbidity and seriousness of complications when these occur. Epidemics of influenza may be caused by type A or B strains, although type B is more likely to occur sporadically. Pandemics are caused only by type A.

Avian influenza refers to a large group of different influenza viruses that primarily affect birds. On rare occasions, these bird viruses can infect other species, including pigs and humans. The vast majority of avian influenza viruses do not infect humans.

Internally displaced person (IDP). A person who, owing to well-founded fear, or fact, of being persecuted for reasons of race, ethnicity, religion, nationality, membership of a particular social group or political opinion, has moved from her or his habitual place of residence within the country of his or her nationality and is unable or, owing to such fear, is unwilling to return to it.

Isolation refers to the separation of people who have a specific infectious illness from those who are healthy and the restriction of their movement to stop the spread of that illness. It is a public health strategy proven effective in stopping the spread of infectious diseases.

Mitigation. Particular action undertaken to moderate the force, intensity or effects of a destructive event or condition.

Pandemic. Refers to an epidemic that has spread over several countries or continents, usually affecting a large number of people. An influenza pandemic is a rare but recurrent event.

Pandemic phases. Systematic epidemiological staging designed to inform the world of the seriousness of the threat of pandemic influenza and to facilitate pandemic planning. Public health goals and outcomes vary between the six pandemic phases.

Phases 3–5 constitute the pandemic alert period during which human infections with a novel influenza virus subtype occur, with varying degrees of human-to-human transmission and disease localization in segments of the population.

Phase 6 is the pandemic period, where there is increased and sustained human-to-human transmission of the novel influenza virus in the general population.

Personal protective equipment (PPE). Individual protective wear for health-care workers that is an integral part of routine infection-control practice and is an important component of prevention and control activities that are intended to reduce the risk of health-care-associated infections in health-care facilities.

Quarantine refers to the separation and restriction of movement of individuals who, while not yet ill, have been exposed to an infectious agent and therefore may become infectious. It is a public health strategy proven effective in stopping the spread of infectious diseases.

Respiratory etiquette. Recommended individual behaviour and best practices for reducing person-to-person respiratory droplet disease transmission. This involves covering the mouth and nose when coughing or sneezing and appropriately disposing of the item used to cover the mouth and nose, and washing hands afterwards before touching anything else.

Risk communication (health). A continuous process of communication to the public by health authorities about the current disease burden, impact and effects on the population. A communication strategy for a pandemic situation should include training in outbreak communication and ensure integration of communicators in senior management teams.

Preparedness. Public health planning and programme activities implemented before the onset of an unusual increase in disease prevalence within the population.

Refugee. Under international law, a refugee is a person who is outside his or her country of nationality or habitual residence; has a well-founded fear of persecution because of his or her race, religion, nationality, membership in a particular social group or political opinion; and is unable or unwilling to avail himself or herself of the protection of that country, or to return there, for fear of persecution. They are a subgroup of the broader category of displaced persons.

Social mobilization. The process of mobilizing all societal and personal influences with the aim of prompting individual and family action. It is an approach that identifies key behaviours through participatory situational analysis and strategically blends a variety of communication interventions intended to engage individuals and families in considering, adopting and maintaining recommended healthy behaviours.

Social distancing. Non-pharmaceutical interventions increasing the physical space between individuals or infected populations with the aim of delaying spread of disease. Examples include: quarantine, closure of schools, confinement, prohibition of mass gatherings and contact-tracing. However, most of the interventions are based on limited evidence. Many of these interventions may affect human behaviour and human rights, and therefore need a strong educational, legal and well-supported basis. Transparent decision-making and frank information-sharing should go hand-in-hand with any social distancing measures considered.

Waste management. Use of WHO-recommended standard methods for the appropriate disposal of solid material that may be contaminated with highly pathogenic biological substances.

Universal hygiene. Community-based practices promoted for implementation by all individuals as a means of further reducing overall transmission of infections within the entire population, such as regular handwashing, safe food-handling, provision and use of safe water, observing recommended environmental health, good personal hygiene and risk-avoidance behaviour.