

Kingdom of Bahrain
Ministry of Health
Public Health Directorate



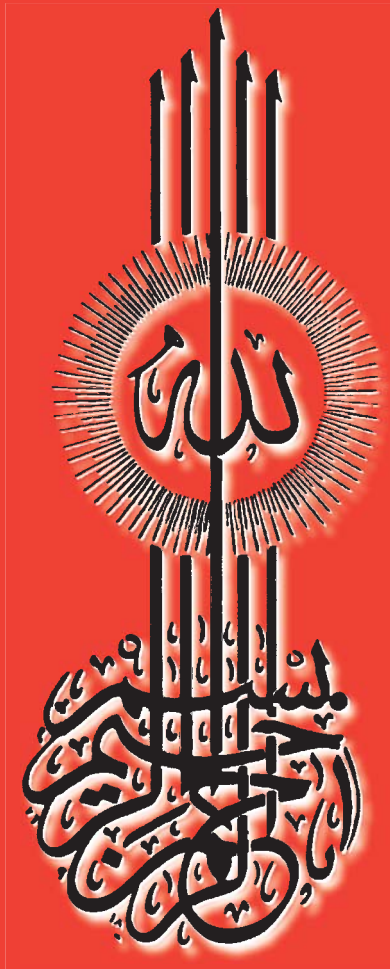
قسم مكافحة الأمراض
Diseases Control Section

AVIAN INFLUENZA (H5N1)

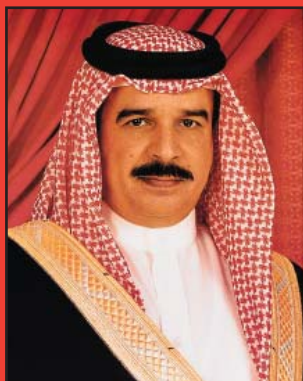
THE CONTINGENCY AND SURVEILLANCE PLAN

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In the Name of Allah
the Most Gracious,
the Most Merciful ...



HM Shaikh Hamad bin
Isa Al Khalifa
The King of Bahrain



HH Shaikh Khalifa bin
Salman Al Khalifa
The Prime Minister



HH Shaikh Salman bin
Hamad Al Khalifa
The Crown Prince and
Commander-in-Chief of the
Bahrain Defence Force

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*T*he aim of this document is to provide a detailed guide for Bahrain's response to a pandemic influenza threat. This plan targets a wide range of people who will be involved in planning and responding to an influenza pandemic: health planners, public and clinical health care providers, border workers, health departments, essential service providers and those involved in the media and communication

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Abbreviations and Acronyms used in Pandemic Influenza Response Operations

A/E	Accident and Emergency
BQIS	Bahrain Quarantine and Inspection Service
CDN	Communicable Diseases Network
CDU	Communicable Diseases Unit
COMS	Chief of Medical Staff
CQO	Chief Quarantine Officer
DCS	Diseases Control Section
DMM	Directorate of Materials Management
DOPR	Director of Public Relations
HCW	Health Care Workers
ICD-10	International Classification of Diseases No 10
ICU	Intensive Care Unit
ILI	Influenza-Like Illness
M.O.H	Ministry of Health
MOFA	Ministry of Foreign Affairs
NEMRN	National Emergency Media Response Network
NAD	Nucleic Acid Detection
NMS	National Medicines Stockpile
NNDSS	National Notifiable Diseases Surveillance System
OCRS	Outbreak Case Reporting System
PHD	Public Health Directorate
PHR	Public Health Relations
PPE	Personal Protective Equipment
WHOCC	World Health Organization Collaborating Centre for Reference and Research on Influenza
MOHAFC	Ministry of Health Avian Flu Committee

The prospect of an influenza pandemic is real. It is impossible to predict when a pandemic might occur but it is certainly possible to be prepared. The Government has already put in place measures to ensure Bahrain is equipped to respond. Among them is a comprehensive guide for the people who will be involved in Bahrain's response to any outbreak.

Since bird flu broke out in late 2003, a significant part of the Bahrain Government health policy has focused on a response plan to a pandemic outbreak. The Government has funded measures such as the National Medicines Stockpile of antiviral drugs and protective equipment. The Government has already established a national joint committee for avian influenza pandemic between Ministry of Health and Ministry of Municipalities & Agriculture Affairs.

The Diseases Control Section at the Public Health Directorate developed a National Management Plan for Pandemic Influenza in 2005 which is updated annually to build national preparedness and capacity for immediate and effective response to any pandemic alert.

The plan centers on the core strategies of containment and maintenance of essential services. This means that, in the early stages, efforts will be concentrated on containing the pandemic to 'buy time' to enable vaccine manufacturers to produce the pandemic influenza vaccine. At best estimates, it will be at least 3 months before a vaccine can be safely given.

If the pandemic becomes widespread, efforts will concentrate on maintaining essential services and, in particular, keeping health services functioning until a pandemic vaccine becomes available.

It is important that Bahraini community has confidence in the decision making processes at all stages. The publication of this interim National Management Plan for Pandemic Influenza provides a timely opportunity for stakeholders to consider these issues and to contribute to Bahrain's capacity to respond in the event of a pandemic threat.

Bahrain is well prepared as any other country to respond to a pandemic flu.

Dr. Faisal Al Hammer
Minister of Health



CHAPTER 1

The disease in birds: impact and control measures^{1,15}

Influenza pandemics have historically taken the world by surprise, giving health services little time to prepare for the abrupt increases in cases and deaths that characterize these events and make them so disruptive. Vaccines - the most important intervention for reducing morbidity and mortality – were available for the 1957 and 1968 pandemic viruses, but arrived too late to have an impact. As a result, great social and economic disruption, as well as loss of life, accompanied the three pandemics of the previous century.

Avian influenza is an infectious disease of birds caused by type A strains of the influenza virus. The disease, which was first identified in Italy more than 100 years ago, occurs worldwide.

All birds are thought to be susceptible to infection with avian influenza, though some species are more resistant to infection than others. Infection causes a wide spectrum of symptoms in birds, ranging from mild illness to a highly contagious and rapidly fatal disease resulting in severe epidemics. The latter is known as “highly pathogenic avian influenza”. This form is characterized by sudden onset, severe illness, and rapid death of affected birds/flocks, with a mortality rate that can approach 100%.

All known subtypes of influenza A virus cause infection in aquatic avian species, thus providing an extensive reservoir of influenza viruses. From time to time these viruses spill over from this natural reservoir causing outbreaks of disease in other species.

Migratory waterfowl – most notably wild ducks – are the natural reservoir of avian influenza viruses, and these birds are also the most resistant to infection. Domestic poultry, including chickens and turkeys, are particularly susceptible to epidemics of rapidly fatal influenza.

Direct or indirect contact between domestic flocks and wild migratory waterfowl has been implicated as a frequent cause of epidemics in poultry populations. It is generally accepted that wild birds act as reservoirs for many of the avian influenza subtypes which can be transmitted to domestic populations of birds and to commercial poultry.² Live bird markets can also play an important role in the spread of avian influenza viruses.

The quarantining of infected farms and destruction of infected or potentially exposed flocks are standard control measures aimed at preventing spread to other farms and eventual establishment of the virus in a country’s poultry population. Apart from being highly contagious, avian influenza

viruses are readily transmitted from farm to farm by mechanical means, such as by contaminated equipment, vehicles, feed, cages, or clothing. Highly pathogenic viruses can survive for long periods in the environment, especially when temperatures are low. Stringent sanitary measures on farms can, however, confer some degree of protection.

Highly pathogenic strains of avian influenza virus, for example H5N1, have crossed from birds to humans and are known to cause fatal disease. Reports of avian to human transmission continue to be reported³.

The Goals and Objectives of the Plan

a) The Strategic Goal

To provide a detailed guide for the country response to a pandemic influenza threat.

This plan targets the wide range of people who will be involved in planning and responding to an influenza pandemic: health planners, public and clinical health care providers, health departments, essential service providers, border workers and those involved in the media and communications. As such, it is intended to provide national guidance for key stakeholders in developing and operationalising responses across the public and private sectors at all levels to ensure Bahrain is optimally prepared and has the capacity to respond to a pandemic threat.

The National Management Plan for Pandemic Influenza is designed to be used at all times from preparedness to pandemic phases, as preparedness is essential for responding to a pandemic event. Therefore, there are actions that can be taken at all phases in the plan. The phases in the plan are consistent with the revised World Health Organization's preparedness plan.

b) The objectives of the Strategic goal

The objectives of the strategic actions correspond to the principal opportunities to intervene and are likewise phase.

Pre-pandemic phase (Inter pandemic)

1. Reduce opportunities for human infection
2. Strengthen the early warning system

Emergence of a pandemic virus (pandemic alert phase)

3. Contain or delay spread at the source

Pandemic declared and spreading internationally (pandemic phase)

4. Reduce morbidity, mortality, and social disruption
5. Conduct research to guide response measures


c) Overall objectives

- Ensure adequate surveillance is in place to detect an emerging threat from the outset.
- Adequately prepare Bahrain to enable the smooth and timely implementation of the specific activities required in the various phases of pandemic planning.
- Ensure rapid characterisation of a new virus subtype and early detection, notification and response.
- Delay entry of a pandemic virus into Bahrain.
- Limit pandemic spread through early containment measures to buy time to implement preparedness measures, including vaccine procurement.
- Limit morbidity and mortality arising from infection with a pandemic strain.

Goal and Objectives of the Plan (Contd.)

- Ensure maintenance of essential services during a pandemic.
- Provide the public, health care workers, the media and other service providers with up to date, authoritative and readily available information at all stages.
- Reduce the stress on the health system and other industries as a result of a pandemic through early identification of additional resources required and implementation of public health and social measures aimed at slowing spread of the virus through the community.

Phases in the Plan

Period	Global phase	Bahrain Phase	Description of phase	Main strategy	
Inter-pandemic	1	Bah 0	No circulating animal influenza subtypes in Bahrain that has caused human disease.	Containment	
		Overseas 1	Animal infection overseas: the risk of human infection or disease is considered low.		
		Bah 1	Animal infection in Bahrain: the risk of human infection or disease is considered low.		
	2	Overseas 2	Animal infection overseas: substantial risk of human disease.		
		Bah 2	Animal infection in Bahrain: substantial risk of human disease.		
		3	Overseas 3		Human infection overseas with new subtype(s) but no human to human spread or at most rare instances of spread to a close contact.
Bah 3	Human infection in Bahrain with new subtype(s) but no human to human spread or at most rare instances of spread to a close contact.				
Pandemic alert	4	Overseas 4	Human infection overseas: small cluster(s) consistent with limited human to human transmission, spread highly localised, suggesting the virus is not well adapted to humans.		
		Bah 4	Human infection in Bahrain: small cluster(s) consistent with limited human to human transmission, spread highly localised, suggesting the virus is not well adapted to humans.		
	5	Overseas 5	Human infection overseas: larger cluster(s) but human to human transmission still localised, suggesting the virus is becoming increasingly better adapted to humans, but may not yet be fully adapted (substantial pandemic risk).		
		Bah 5	Human infection in Bahrain: larger cluster(s) but human to human transmission still localised, suggesting the virus is becoming increasingly better adapted to humans, but may not yet be fully adapted (substantial pandemic risk).		
	6	Overseas 6	Pandemic overseas- not in Bahrain: increased and sustained transmission in general population.		Maintain essential services
		Bah 6a	Pandemic in Bahrain: localised (one area of country).		
Pandemic		Bah 6b	Pandemic in Bahrain: widespread.		
		Bah 6c	Pandemic in Bahrain: subsided.		
		Bah 6d	Pandemic in Bahrain: next wave.		

Two phases may be referred to simultaneously, for example, one phase for what is occurring overseas and one phase for Bahrain. The phases are intended to guide actions rather than be a strict categorization of the events.

a) Interpandemic period

Phase Bah 0: No new influenza virus subtypes have been detected in humans. An influenza virus subtype that has caused human infection or disease is not present in animals in Bahrain.

Rationale: Influenza subtypes that have caused human infection and/or disease may not always be present in wild birds or other animal species in Bahrain. The WHO global phases do not include a Phase 0 because globally, it is likely that influenza sub-types that have caused human infection and/or disease will always be present in wild birds or other animal species, but this is not the case in Bahrain. Lack of recognised animal or human infections does not mean that no action is needed. Preparedness requires planning and action in advance.

Phase Overseas 1: No new influenza subtypes have been detected in humans. An influenza virus subtype that has caused human infection or disease is present in animals overseas. The risk of human infection or disease is considered to be low.

Phase Bah 1: No new influenza virus subtypes have been detected in humans. An influenza virus subtype that has caused human infection or disease is present in animals in Bahrain. The risk of human infection or disease is considered to be low.

Rationale: Although the risk of human infection or disease is considered low, there are actions that differentiate this phase from Phase Bah 0. (For example, enhanced surveillance in animals).

Phase Overseas 2: No new influenza virus subtypes have been detected in humans. However, the presence of a circulating animal influenza virus subtype overseas poses a substantial risk of human disease.

Phase Bah 2: No new influenza virus subtypes have been detected in humans. However, the presence of a circulating animal influenza virus subtype in Bahrain poses a substantial risk of human disease.

Rationale: Presence of animal infection caused by a virus of known human pathogenicity may pose a substantial risk to human health and justify public health measures to protect persons at risk.¹²

b) Pandemic alert period

Phase Overseas 3: Human infection(s) with a new subtype overseas, but no human to human spread, or at most rare instances of spread to close contact.

Phase Bah 3: Human infection(s) with a new subtype in Bahrain, but no human to human spread, or at most rare instances of spread to a close contact

Rationale: The occurrence of cases of human disease increases the chance that the virus may adapt or re-assort to become transmissible from human to human, especially if coinciding with a seasonal outbreak of influenza. Measures are needed to detect and prevent spread of disease. Rare instances of transmission to a close contact- for example, in a household or health care setting may occur, but do not alter the main attribute of this phase, i.e. that the virus is essentially not transmissible from human to human.

Description of Bahrain phases (contd.)

Examples:

1. One or more unlinked human cases with a clear history of exposure to an animal source/ non-human source (with laboratory confirmation in a WHO Collaborating Centre).
2. Rare instances of spread from a case to close household or unprotected healthcare contacts without evidence of sustained human to human transmission.
3. One or more small independent clusters of human cases (such as family members) who may have acquired infection from a common source or the environment but for whom human to human transmission cannot be excluded.
4. Persons whose source of exposure cannot be determined, but are not associated with clusters or outbreaks of human cases.

Phase Overseas 4: Small cluster(s) consistent with limited human to human transmission overseas but spread is highly localised, suggesting the virus is not well adapted to humans.

Phase Bah 4: Small cluster(s) consistent with limited human to human transmission in Bahrain but spread is highly localised, suggesting the virus is not well adapted to humans.

Rationale: Virus has increased human to human transmissibility but is not well adapted to humans and remains highly localised, so that its spread may possibly be delayed or contained.

Examples:

1. One or more clusters involving a small number of human cases, i.e. if a cluster of < 25 cases with the cluster lasting <2 weeks.
2. Appearance of a small number of human cases in one or several geographically-linked areas without a clear history of a non-human source of exposure, for which the most likely explanation is considered to be human to human transmission.

Phase Overseas 5: Larger cluster(s) but human to human spread still localized overseas, suggesting that the virus is becoming increasingly better adapted to humans, but may not yet be fully transmissible (substantial pandemic risk).

Phase Bah 5: Larger cluster(s) but human to human spread still localised in Bahrain, suggesting that the virus is becoming increasingly better adapted to humans, but may not yet be fully transmissible (substantial pandemic risk).

Rationale: The virus is more adapted to humans, and therefore more easily transmissible among humans. It spreads in larger clusters, but spread is localised. This is likely to be the last chance for massive coordinated global intervention, targeted to one or more foci, to delay or contain spread. In view of possible delays in documenting spread of infection during Phase 4, it is anticipated that there would be a low threshold for progress to Phase 5.

Examples:

1. Ongoing cluster-related transmission but total number of cases is not rapidly increasing, i.e. if a cluster of 25-50 cases with the cluster lasting from 2-4 weeks.
2. Ongoing transmission but cases appear to be localized .
3. In a community known to have a cluster, appearance of a small number of cases whose source of exposure is not readily apparent (eg beginning of more extensive spread).
4. Appearance of clusters caused by same or closely related virus strains in one or more geographic areas without rapidly increasing numbers of cases.

Description of Bahrain phases (contd.)

c) Pandemic period

Phase Overseas 6: Increased and sustained transmission in the general population overseas.

Rationale: Major change in global surveillance and response strategy, since pandemic risk is imminent for all countries. The national response is determined primarily by the disease impact within the country.

Phase Bah 6a: Increased and sustained transmission in the general population in Bahrain, but cases are still localised to one area of the country.

Phase Bah 6b: Increased and sustained transmission in the general population in Bahrain and cases are occurring in multiple areas of the country.

Phase Bah 6c: Increased and sustained transmission in the general population in Bahrain but the number of cases is subsiding.

Phase Bah 6d: The next wave of the pandemic has reached Bahrain indicated by an increase again in the number of cases.

Rationale: Although a pandemic has been declared, because Bahrain is not as densely populated as other countries, there still exists the opportunity to try to contain the spread of the pandemic in the later phases.

d) Post-pandemic period

A return to the inter-pandemic period (the expected levels of disease with a seasonal strain) follows, with regularly updated planning. An intensive phase of recovery and evaluation may be required.



CHAPTER 2

Published information about the clinical course of human infection with H5N1 avian influenza is limited to studies of cases in the 1997 Hong Kong outbreak. In that outbreak, patients developed symptoms of fever, sore throat, cough and, in several of the fatal cases, severe respiratory distress secondary to viral pneumonia. Previously healthy adults and children, and some with chronic medical conditions, were affected.

Tests for diagnosing all influenza strains of animals and humans vary in sensitivity and specificity depending on the timing of specimen collection and type of test used.

Antiviral drugs, some of which can be used for both treatment and prevention, are clinically effective against influenza A virus strains in otherwise healthy adults and children, but have some limitations. Some of these drugs are also expensive and supplies are limited.

Experience in the production of influenza vaccines is also considerable, particularly as vaccine composition changes each year to match changes in circulating viruses due to antigenic drift. However, at least four months would be needed to produce a new vaccine, in significant quantities, capable of conferring protection against a new virus subtype.

Incubation period

The incubation period for influenza viruses is short 1-3 days. However with H5N1 the incubation period is currently uncertain.

Case definition for avian influenza (H5N1)⁸

a) Suspected case of avian influenza (H5N1)

1- Clinical presentation

- Fever ($>$ or $= 38^{\circ}\text{C}$) OR history of fever and respiratory symptoms (cough or shortness of breath) requiring hospitalization.

OR

- Death from unexplained respiratory illness

AND

2- Epidemiological criteria

- History of travel in the 7 days prior to onset of symptoms to any affected area and close contact (within 1 metre) with live or dead domestic fowl, wild birds, or swine in any setting, including bird markets.
- OR one of the following
- Close contact (touching/speaking distance) with other case(s) of severe respiratory illness or unexplained death from affected areas.
- Part of a health care worker cluster of severe unexplained respiratory illness.
- A laboratory worker with potential exposure to influenza A (H5N1).

b) Probable case of influenza A (H5N1)

Limited laboratory evidence of influenza A (H5N1).

c) Confirmed case of influenza H5N1

A confirmed case of influenza H5N1 infection is an individual for whom laboratory testing demonstrates one or more of the following:

- Positive viral culture for influenza A/H5.
- Positive polymerase chain reaction (PCR) for influenza A/H5.
- Positive immunofluorescence antibody (IFA) test to H5 antigen using H5 monoclonal antibodies.
- 4-fold rise in H5 specific antibody titre in paired serum samples.

d) Exclusion criteria

A case should be excluded if an alternative diagnosis can fully explain their illness.

Dealing with Suspected or probable case.

1. If the patient meets the definition of suspected or probable case, he/she must be isolated in a single room preferably with negative pressure or a single room with non shared air conditioning and ventilation system and with its own bathroom facility.
2. Appropriate disinfections of furniture and environmental surface using hospital grade germicide is recommended.
3. Use complete nursing barrier while taking care of patient.
4. No specific treatment known to be specific or effective for treatment of Avian Influenza cases. Empiric therapy should include coverage for organisms associated with any community-acquired pneumonia of unclear etiology, including agents with activity against both typical and atypical respiratory pathogens. The main line of treatment includes supportive treatment, Broad-spectrum antibiotics, antiviral and steroids.
5. Confirm laboratory diagnosis for probable and suspected cases.

Samples to be taken from patients

- Acute and convalescent blood for serology with at least 2 weeks between acute and convalescent samples.
- Blood samples: 10 cc of blood for viral culture, PCR and antigen detection.
- Swabs:
 - o Nasopharyngeal or throat in viral transportation media.
 - o Bronchioalveolar lavage.
 - o Stool for virology in viral transport media.

Post mortem specimens

Samples may be taken from dead humans to assist diagnosis, including; all tissues from biopsy or autopsy - fresh and fixed: lung, liver, spleen, brain etc.

Investigations

The optimal specimen for influenza A virus detection is a nasopharyngeal aspirate obtained within

3 days of the onset of symptoms, although nasopharyngeal swabs and other specimens can also be used. Manipulations of specimens and diagnostic testing should be carried out under biosafety guidelines. Annex6

The strategy for initial laboratory testing of each specimen should be to diagnose influenza A virus infection rapidly and exclude other common viral respiratory infections. Results should ideally be available within 24 hours.

Procedures for influenza diagnosis: Annex8

Assays available for the diagnosis of influenza A virus infections include:

1. Rapid antigen detection.

Results can be obtained in 15–30 minutes.

- Near-patient tests for influenza. These tests are commercially available.
- Immunofluorescence assay. A widely used, sensitive method for diagnosis of influenza A and B virus infections and five other clinically important respiratory viruses.
- Enzyme immunoassay. For influenza A nucleoprotein (NP).

2. Virus culture.

Provides results in 2–10 days. Both shell-vial and standard cell-culture methods may be used to detect clinically important respiratory viruses. Positive influenza cultures may or may not exhibit cytopathic effects but virus identification by immunofluorescence of cell cultures or haemagglutination-inhibition (HI) assay of cell culture medium (supernatant) is required.

3. Polymerase chain reaction and Real-time PCR assays.

Primer sets specific for the haemagglutinin (HA) gene of currently circulating influenza A/H1, A/H3 and B viruses are becoming more widely used. Results can be available within a few hours from either clinical swabs or infected cell cultures. Additionally several WHO Collaborating Centres are developing PCR and RT-PCR reagents for non-typical avian/human influenza strains.

Any specimen with a positive result using the above approaches for influenza A virus and suspected of avian influenza infection should be further tested and verified by a designated WHO H5 Reference Laboratory i.e. Laboratories that lack the capacity to perform specific influenza A subtype identification procedures are requested to:

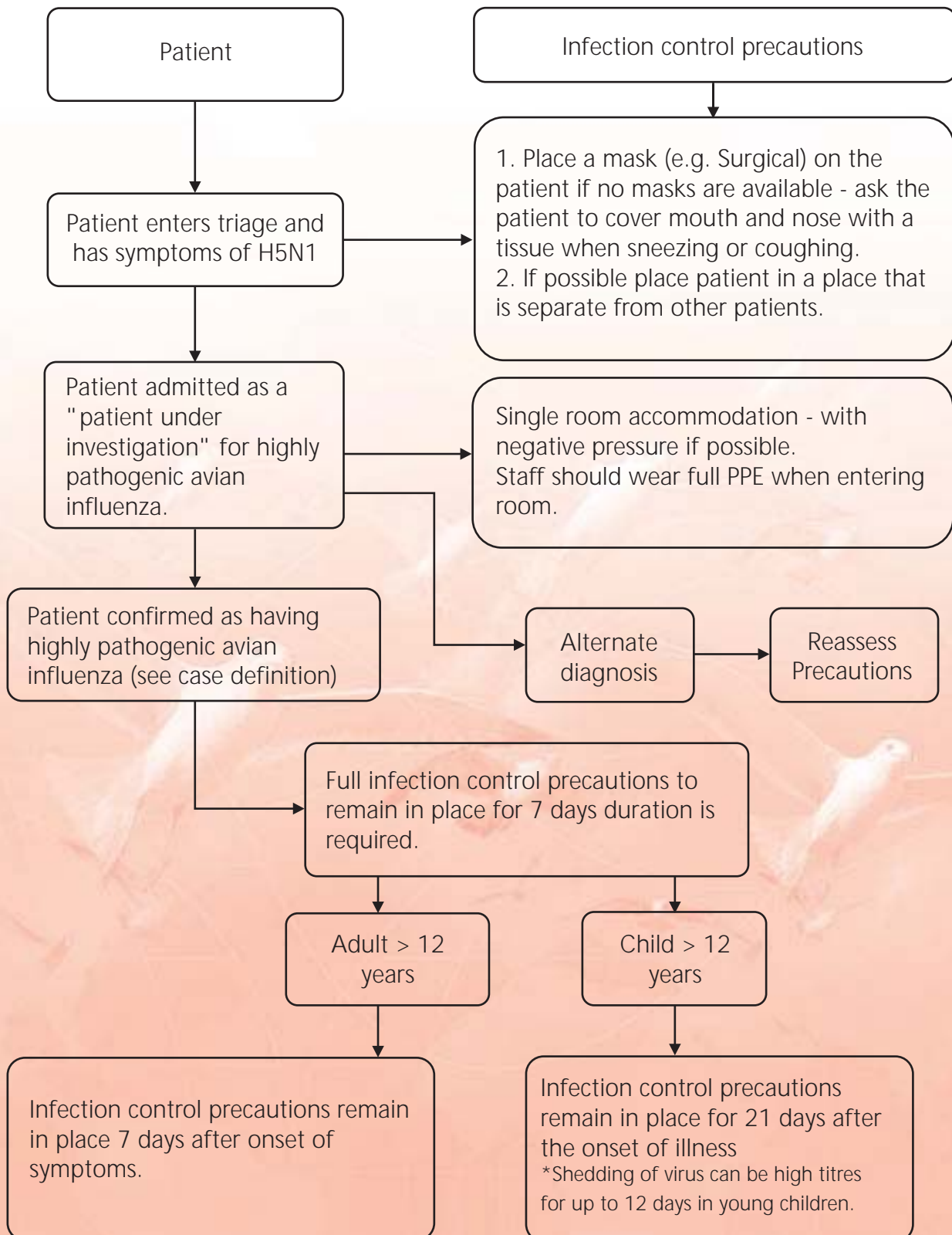
- Forward specimens or virus isolates to a National Influenza Centre then to a WHO H5N1 Reference Laboratory for further identification or characterization. Annex7
- Inform the WHO Regional Office that specimens or virus isolates are being forwarded to other laboratories for further identification or further characterization.

Infection control precautions for H5N1:

Infection control for H5N1 involves a two-level approach:

- Standard precautions which apply to ALL patients at ALL times, including those who have H5N1; and
 - Additional precautions which should include:
 - o Droplet precautions,
 - o Contact precautions, and
 - o High-efficiency mask and negative pressure room if possible.
- Transmission of human influenza is mostly by droplets. Direct or indirect contact and airborne transmissions are also recognized, the latter can involve fine droplet nuclei suspended in the air for considerable duration of time. However, during the last Hong Kong H5N1 outbreak in humans in 1997, droplet and contact precautions successfully managed patients without nosocomial spread of the disease. So far there is no evidence suggesting airborne transmission of the disease from the current outbreaks, but because of the high mortality of the disease and possibility of mutation of the virus to cause efficient human-to-human transmission, WHO is currently recommending the use of high- efficiency masks in addition to droplet and contact precautions for care of human cases of H5N1. For the same reason, a negative pressure room may be preferred if available.
- A combination of these precautions will give the appropriate infection control.
- Strict adherence to these precautions is required to break the chain of infection transmission.
- Annex1 + annex 4

When to Initiate Infection Control Precautions in the Health Care Facility



Case Management

A. Assessment of infectious cases by medical practices

During a pandemic, infectious cases may telephone or present to health facilities. In this situation, the objective is to prevent transmission to attending medical practice staff and patients.

Medical practice staff who are eligible for antiviral prophylaxis should be provided with the medication (if it is available) and written information about its use, recommended infection control precautions, and what to do if they develop symptoms of infection.

B. Prior to clinical assessment of an infectious case

Any patient who telephones or presents at a medical practice for an appointment should immediately be questioned to determine if he or she could be an infectious case.

The suspected case should be provided with a surgical mask prior to entering the medical practice, ambulance or assessment by the doctor.

If the patient telephoning the medical practice appears to be an infectious case, then the doctor should refer the patient to the relevant hospital or If the doctor assesses the patient at the medical practice, the patient should wear a surgical mask and be separated from other patients and staff.

If the doctor considers the patient to require immediate hospitalisation, then the doctor should telephone the ambulance service and advise the ambulance officer that the patient is an infectious case and that the attending ambulance officer should wear the recommended PPE and inform the receiving hospital emergency department or clinic prior to the patient's arrival.

If an infectious case presents to the medical practice without telephoning, then the patient should immediately be provided with a surgical mask and separated from other patients and staff prior to assessment by the doctor.

C. During clinical assessment of an infectious case

The attending doctor or any other person entering the room containing the infectious case should wear full PPE.

Take respiratory and blood specimens for laboratory testing for influenza and other infections as clinically indicated.

Treat with a neuraminidase inhibitor such as oseltamivir as early in the clinical course as possible.

If clinically indicated, hospitalize patients under appropriate infection control precautions as described in previous sections.

If a case is assessed as not requiring hospitalization, educate the patient and his or her family on personal hygiene and infection control measures (e.g. hand-washing, use of a paper or surgical mask by the ill person, and restriction of social contacts), and instruct the patient to seek prompt medical

care if the condition worsens. As resources permit, follow up non-hospitalized patients by home visits or telephone contact.

Provide supportive care. Monitor oxygen saturation and treat desaturation with supplemental oxygen as required. As nebulizers and high-air-flow oxygen masks have been potentially implicated in the nosocomial spread of severe acute respiratory syndrome, use these measures only if clinically justified and apply them under strict infection control, including airborne transmission precautions.

Take respiratory and blood specimens serially to check for possible bacterial infection. Consider intravenous antibiotic therapy to control secondary bacterial infections as required.

Do not use amantadine or rimantadine because of the risk of increasing the selective pressure for development of a resistant influenza virus with pandemic potential.

Avoid administration of salicylates (such as aspirin) in children under 18 years of age because of the risk of Reye syndrome. Use paracetamol or ibuprofen, either orally or by suppository, for management of fever as clinically indicated.

Immunomodulators such as corticosteroids should be used only in the context of clinical trials. The immune response of humans with influenza A(H5N1) infection requires further study.

Do not use ribavirin. There is no evidence to support its effectiveness against influenza viruses; moreover, adverse reactions such as anaemia are frequent and may further compromise the patient.

D. Following clinical assessment of an infectious case

Attending doctors should avoid touching their own eyes, noses and mouths until they have removed themselves from the enclosed space with the infectious cases, disposed of their gloves, eyewear, masks, gowns, and washed their hands.

Used masks, gown, and gloves should be disposed of in a sealed bag in general waste and reusable PPE should be kept in a sealed bag and disinfected as per the manufacturer's instructions.

If the patient is discharged home, then the patient should be advised to avoid contact with other persons until the infectious period has passed, and should be provided with written information advising the patient what infection control precautions to take and what actions to take if the symptoms worsen.

Non disposable equipment used on the patient should be disinfected according to manufacturer's instructions.

E. Discharge policy

Studies are required to provide better understanding of viral excretion patterns in humans infected with the influenza A(H5N1) viruses associated with the current outbreaks until further evidence is available, WHO recommends that infection control precautions for adult patients remain in place for 7 days after resolution of fever.

Previous human influenza studies have indicated that children younger than 12 years can shed virus for 21 days after onset of illness. Therefore, infection control measures for children should ideally remain in place for this period. Where this is not feasible (because of a lack of local resources), the family should be educated on personal hygiene and infection control measures (e.g. hand-washing and use of a paper or surgical mask by a child who is still coughing). Children should not attend school during this period. Annex1.

F. Public Health Measures

1. Reporting of Cases

Report to the local public health authority at the Disease Control Section all patients for whom the diagnosis of influenza A (H5N1) virus infection is being considered (cases report form). Annex5.

Anyone who has had contact with a patient with H5N1 should be considered for prophylaxis or treatment with Oseltamivir.

2. Management of contacts

– Contact definition

A contact of pandemic influenza is a person who had close (ie within one metre) contact with an infectious case or who has spent more than 60 minutes in a confined space (such as an aeroplane, or an enclosed room) with an infectious person.

When a patient is diagnosed with pandemic influenza, the Disease Control Section will become involved. They will perform contact tracing to identify close contacts – for example, family members, work or classroom contacts. Once a pandemic is established it may not be possible to do this because of the increasing number of contacts.

Depending upon the transmissibility of the virus and the demands on Diseases Control Section, contacts will undergo monitoring (passive surveillance or active surveillance) and quarantine. It is likely that contact monitoring will be instituted in Phase Overseas 3, when the first human cases are occurring. Quarantine of contacts, in conjunction with monitoring will be implemented in Phase Overseas 4, when human to human transmission is occurring in small clusters.

When animal disease is present, a person who has had exposure to an animal or its environment in an area known to have outbreaks will also require monitoring through Disease Control Section. This monitoring is likely to start at Phase Overseas 1.

– Duration of monitoring and quarantine of contacts.

Provided the person who is a contact does not become symptomatic, the duration of monitoring and quarantine will be for:

- Two times the incubation period of the virus, from the day of last exposure; OR
- Until the diagnosis of pandemic influenza has been excluded in the index case.

These persons should be monitored for 7 days after their last exposure to the implicated patient or to the common source and asked to check their temperature twice daily. If a person who is being monitored develops fever ($>38\text{ }^{\circ}\text{C}$) and cough or shortness of breath, he or she should be treated immediately.

– Monitoring of contacts

- Active surveillance

Communicable Diseases Unit staff will contact a person daily to assess the person's health, either by telephone or in person. All people on active daily surveillance should measure and record their temperatures twice daily (at least 4 hours after any medications that may lower fever).

- Passive surveillance

Contacts will be asked to monitor their own health, record their temperatures daily and report to the Communicable Disease Unit if they develop a fever or respiratory symptoms.

- Quarantine

Quarantine applies to people who have been exposed to someone with pandemic influenza and may be infected, but are not symptomatic. Separating exposed people and restricting their movements is intended to stop the spread of pandemic influenza. People may be quarantined in their own homes or in another facility. In most cases, quarantine is voluntary; however, the Bahrain Government has authority to compel quarantine to protect the public. Those in quarantine will still be monitored.

- Antivirals

Uninfected contacts who are eligible for antiviral prophylaxis should be provided with the medication (if it is available) and written information about its use, recommended infection control precautions, and what to do if they develop symptoms of infection.

– Education of contacts Annex 4

Uninfected contacts quarantined at home with an infected case are advised to:

- minimise close contact with the infectious case
- Use separate living, dining, bathing, laundry and toilet facilities to the infectious case (if available).
- Minimise use or handling of (and regularly clean) items or surfaces in the home that might be used/touched by the infectious case.
- Wear masks (if available), or cover their nose and mouth while in close contact (ie less than one metre) or while in a confined space with the infectious case.

3. Care of the deceased

The care of deceased pandemic influenza patients raises infection control issues, along with significant social and religious considerations. Annex 1



CHAPTER 3

A. Border control

Bahrain, being an island nation, has a greater opportunity than other countries to prevent or delay the entry of pandemic influenza into Bahrain. Accordingly, the Government is prepared to implement border measures with this objective. When pandemic influenza events escalate overseas, detecting cases of pandemic influenza at Bahrain's international airports – while recognising that individuals may be incubating the disease and have no symptoms.

Positive pratique will be required of aircraft commanders replacing the current pratique by exception. Positive pratique requires the aircraft commander to declare the health of all people on board, whereas current pratique requires the commander only to notify if an ill passenger is on board.

Entry screening will include health declaration cards, handed out by airlines and checked by Customs officers. Additional BQIS staff will assist with thermal scanning equipment to detect passengers with a fever. Those identified as possible cases (for example, high temperature on thermal scanner or symptoms of influenza on the health declaration card) will be assessed by a border nurse Annex 9. Nurses placed at the border will assess the passenger as described by an algorithm Annex 9 and contact the CQO as required.

In some situations, large numbers of people arriving at the border may need to be quarantined from others, to prevent transmission of pandemic influenza. If the pandemic reaches Bahrain, and is not widespread in other parts of the world, the PHD will consider instituting exit screening of outgoing passengers. This will also include thermal imaging and health declaration cards and is designed to prevent people with pandemic influenza from travelling to countries that are free of disease. This is in keeping with international obligations to prevent the spread of disease. Control of the Disease at the causeway and ports Annex 9.

B. Measures to increase social distance

Background

During a pandemic of influenza, measures to increase social distance may be instituted or recommended. These measures, which include closure of schools and restricting mass gatherings such as concerts, are intended to prevent transmission of influenza between people. In the setting of influenza, as people may be infectious before the onset of symptoms, measures that reduce contact between people regardless of symptom status may be particularly effective. The WHO consultation on priority public health interventions before and during an influenza pandemic 2004 recommended that authorities consider measures such as closure of schools, closing workplaces and discouraging mass gatherings, depending upon epidemiological characteristics of the particular virus such as attack rates in different age groups (ie proportion of the different age groups infected) and transmission characteristics.

In recommending measures to increase social distance, other considerations will include mathematical modelling of the effectiveness of the interventions and feasibility of the interventions, given their significant social and economic implications.

Clearly, the nature and timing of implementation of social distancing measures will require careful

consideration and judgement in light of the severity and mortality of the pandemic strain.

Restricting mass gatherings

During the 1957-1958 pandemic, a WHO expert panel found that spread within some countries followed public gatherings, such as conferences and festivals. This panel also observed that in many countries the pandemic broke out first in camps, army units and schools; suggesting that the avoidance of crowding may be important in reducing the peak incidence of an epidemic.

Closure of schools

Closure of schools may be particularly effective in a pandemic of influenza because of the role children play in spreading influenza. Also, during the first wave of the Asian influenza pandemic of 1957-1958, the highest attack rates were seen in school aged children. This has been attributed to their close contact in crowded settings. A recently published study found that during an influenza outbreak, school closures were associated with significant decreases in the incidence of viral respiratory diseases and health care utilization among children aged 6-12 years.

C. The National Medicines Stockpile (NMS)

Background

Influenza antiviral drugs will play an important role during a pandemic, particularly during the first wave of infection when pandemic vaccines may not be available. In the absence of vaccines, antivirals are the only medical intervention for providing protection against disease and some therapeutic benefit in those who are ill.

Priority groups

The role of influenza antivirals will be constrained, however, by their finite supply, negligible surge capacity for production, and cost. Because of this, priority groups for their use must be determined to ensure that they are used to Bahrain's best advantage. As the overall aim underlying Bahrain's response to a pandemic influenza threat is to reduce the associated population wide morbidity and mortality, their use will be determined within this principle.

The recommendations can be found in Annex 13

Activation and deployment of the NMS

The process to activate the NMS deployment plan is that the COMS of an affected health facility provides written request to the DMM for access to the NMS.

The amount of antivirals deployed will be a decision of the COMS after due consideration. Each requesting place is required to have distribution plans in place, including details of security measures and arrangements for dispensing including supervision, records of treatment and monitoring of outcomes, including adverse reactions. The DMM has ownership of the stockpile until each item is used/consumed/expired.

In the event of requiring additional drugs - for example antibiotics for secondary chest infections - the above process will need to be carried out for each drug.

D. Health service delivery

Maintaining health services in the setting of unprecedented demands and disruptions will be a challenging, but vital, aspect of the pandemic influenza response.

Stakeholder groups responsible for direct health service delivery are considering the following issues in pandemic planning:

- **Cases identified at the border**

The measures that will need to be implemented in response to the first cases of pandemic influenza being detected at the border.

- **Detecting the first cases of pandemic influenza in community settings**

A national education campaign that focuses on how first line health care workers can identify suspected cases of severe respiratory diseases in returned travellers, the measures they can take to protect themselves and their patients, and the importance of talking to Communicable Diseases Unit about such patients should be done by the members of the Ministry of Health Committee.

- **Fever clinics and designated isolation facilities**

When cases in Bahrain increase, Avian Flu Committee, will consider setting up fever clinics and designated isolation facilities which are staffed by protected or immune staff. Fever clinics are triage settings in which all suspected cases of pandemic influenza can be assessed to determine whether they are likely to have influenza and where they are best managed. Designated isolation facilities are places where patients that require hospitalisation are managed. The purpose of these clinics/facilities is to streamline the delivery of care to these patients, cope with the rapid increase in illness in the community and lessen the transmission of influenza to patients that are not infected.

- **Home care**

Health authorities, in conjunction with community care services, will consider aspects such as access to medical review and medications for those not admitted to hospital. Community care and hospital in the home arrangements that some hospitals currently utilise will take on increasing importance.

- **Hospitals**

Hospitals may activate their emergency plans enabling them to cease elective admissions and discharge suitable patients. Within hospitals/isolation facilities, providing care for influenza patients will ideally take place in negative pressure isolation rooms, or if these are not available, by co-allocating influenza patients.

- **Diseases Control Section and contact tracing**

Diseases Control Section will play an important role in providing information to health professionals and the public about aspects of the management of people with or exposed to pandemic influenza, such as the need for testing, notification, isolation and quarantine. At least in the early phases, Diseases Control Section will be involved in contact tracing to identify those who have been exposed to a particular patient and need to be quarantined.

- **Isolation**

Patients who are suspected to be infected with influenza because they are symptomatic need to be isolated from others. This will occur either in the home or a health care setting and will be for the duration of the infectious period. This is to prevent them from infecting others. Patients and their families will be given educational materials which will include advice about infection control practices that can prevent/ reduce transmission between the patient and others.

- **Quarantine**

Depending upon the pandemic phase, those who have been exposed to a person with influenza but do not have symptoms should be quarantined. This is to lessen the chance that, have they been infected, they transmit the infection to others.

- **Clinical care guidelines**

Clinical care guidelines will be a critical tool for all health care workers in triaging, assessing and managing possible and confirmed cases. CDU is currently consulting with infection control clinicians on the content of national guidelines and responsibility for their development.

E. Pandemic vaccination

Pandemic influenza vaccine

The influenza vaccine composition depends upon the particular strain that is causing the pandemic, and this cannot be known in advance. Vaccine production is also subject to complex processes, and although options to shorten the lead-time for vaccine production are being developed, it may take some months before the vaccine is available. Until a vaccine is available, other measures to protect the population, such as PPE, antiviral medications and isolation of affected persons will be utilised.

Initially, the vaccine will be in short supply and its use will have to be prioritised. Priority groups being considered include essential workers such as health care staff and emergency personnel. These priority groups will be continually revised in light of new information that is learnt about the pandemic virus, who it is affecting, and what is required to maintain effective services. When sufficient pandemic influenza vaccine is available, the Bahrain population in need will be offered vaccination.

Other vaccines

Attaining high rates of coverage of the normal seasonal influenza vaccine and the pneumococcal vaccine in identified cohorts and high risk groups during the interpandemic (or non-pandemic period)

was identified as a priority in the Bahrain Action Plan for Pandemic Influenza (2006). For further details see Annex12

F. Communications

Information for and management of, Bahrainis overseas

Ministry of Foreign affairs (MOFA) missions provide consular contingency support for all Bahrainis in-country, including mission staff from all agencies, and could be drawn upon quickly in the event of a pandemic.

MOFA and PHD travel advice, will continue to be the primary mechanism for informing the Bahraini travelling public about the risk of pandemic influenza through the website: www.ai.moh.gov.bh. Advice appropriate to the phase of the pandemic and assessed risk will be communicated via travel advisories, including if necessary, a recommendation to avoid all travel to affected areas and urging travellers in the affected regions to return to Bahrain. Annex 16,17

Those returning to Bahrain from affected areas may be required to undergo additional disease screening and quarantine measures.

A prepared public through a prepared media

Due to the ongoing concerns about avian influenza outbreaks, Bahrain has a range of communications activities and tools already in place to inform and reassure the public, and the media, about Bahrain's preparations for an influenza pandemic. Annex 19

This communications plan outlines the main steps that have already been taken in preparation and steps that will be activated in the event of an Influenza pandemic. The plan follows the WHO and Bahrain's key alert periods and action phases, although the communications plan remains flexible and adaptable to the circumstances of the time.

1. Free Call Information Line: 17279618-17279610 (8:00AM – 01:00PM) Sunday to Thursday.

Phases: Overseas 1, Overseas 2, Overseas 3, Bahrain 0, Bahrain 1 and Bahrain 2

The call centre personnel are well briefed on pandemic and other health emergency issues with an approved set of questions and answers and referrals to other relevant departments where further information can be obtained. In an emergency, this phone line has the capacity to significantly expand its capability and its hours of operation.

Phases: Overseas 4, Overseas 5, Bahrain 3, Bahrain 4 and Bahrain 5

- During these phases the hotline capacity would be enhanced
- Coordination between the CDU and hotline.

Phases: Overseas 6, Bahrain 6a, Bahrain 6b, Bahrain 6c and Bahrain 6d

- During these phases the hotline capacity would be enhanced
- development of further phone lines

2. Websites

The MOH website at www.health.gov.bh and the avian flu website www.ai.moh.gov.bh will play a vital role in informing the public and the media about health measures, warnings and the current situation. It will be particularly useful in providing media with messages, media transcripts, photos and vital public health informations.

Phases: Overseas 1, Overseas 2, Overseas 3, Bahrain 0, Bahrain 1 and Bahrain 2

During this phase the website www.ai.moh.gov.bh links to avian influenza information for the public, health professionals and the media. This site is regularly updated and contains:

- About avian influenza.
- Case definition of avian influenza
- A brochure Preparing for an influenza Pandemic, which provides guidance in the recognition and management of cases of severe respiratory illness in people who have traveled to areas at risk, as well as information on what to expect during a pandemic.
- A poster for the waiting rooms to assist members of the public to identify themselves as at-risk.
- A poster for health care workers with information on respiratory hygiene and infection control.
- A fact sheet on influenza for members of the public. (Frequently asked questions) Annex 15,18
- A fact sheet on infection control for health care workers.
- Sample of the health information “try safer fly” to all incoming passengers during the pandemic.
- Sample of the Health Declaration Card that will be required to be filled out by all incoming passengers and crews in the event of a respiratory outbreak. Annex 17
- Surveillance algorithm sheets 1-14.
- Traveler bulletin. Annex 16
- A summary review of action taken according to place time and responsible institution.
- Poultry surveillance for avian influenza.

Phases: Overseas 4, Overseas 5, Bahrain 3, Bahrain 4 and Bahrain 5

During this phase extra attention will be paid to the website to enhance its capacity to be a vital source of information. Actions will include:

- Web and online staff capacity increased to give priority to posting pandemic information (PHD web services)..
- Website to be updated and maintained on a daily basis (Media Unit).
- posting twice daily of avian or pandemic influenza news bulletins from the (Media Unit).
- Regular posting of media interviews, including MP3 sound bytes, pictures and educational materials by the COMS and minister (Media Unit).
- Regular liaison with other agencies, including medical colleges to ensure consistency of messages and links with their websites.

Phases: Overseas 6, Bahrain 6a, Bahrain 6b, Bahrain 6c and Bahrain 6d

During this phase the website will become even more important and actions to be undertaken to enhance its capacity to include:

- Establishment of a separate, dedicated influenza pandemic website (Media Unit/Webs)

Disease Control Measures (contd.)

- Full time webmaster assigned to manage the site (Media Unit).
- Regular updating of information including health messages, warnings, educational literature and frequently asked questions.
- Special attention given to health professionals' subsite and media centre site.

3. Media Relations Actions

From the onset of the Asian avian influenza outbreaks, Bahrain's Diseases Control Section, has been freely available to a wide range of media, including medical press, in an effort to inform the public and health professionals about Bahrain's preparedness for a pandemic.

Phases: Overseas 1, Overseas 2, Overseas 3, Bahrain 0, Bahrain 1 and Bahrain 2

During this present stage a range of communications activities are being undertaken.

Including:

- Regular media interviews and briefings by the Diseases Control Section.
- Special articles and interviews arranged for the Diseases Control Section with medical media.
- Coordination of media responses.
- Formal background briefings between the Disease Control Section and media editors to lay the foundations for what the public may face during an influenza pandemic.
- Publicising of announcements on Bahrain health response to a pandemic by minister.

Phases: Overseas 4, Overseas 5, Bahrain 3, Bahrain 4 and Bahrain 5

During this phase communications with the public via the media will be crucial.

Actions will include:

- Establishing a dedicated media conference room lectern microphone and sound equipment are on 24 hour standby and a PHR backdrop has been produced (Media Unit).
- Activating the Media Liaison surge team –from the Communications Branch of PHR and Disease Control Section have been identified (with relevant security clearances), to provide surge capacity for media liaison in a health emergency (Media Unit).
- Expanding the capacity of existing media relations – additional phone lines to be attached to cope with calls (Media Unit).
- Priority for media monitoring and tracking by the existing media monitoring team within the Communications Branch (Editorial and Media Relations Unit).
- Production of daily news bulletins from the Diseases Control Section (Media Unit).
- The holding of one main media conference per day by the Diseases Control Section arranged by PHR, with transcripts and sound bytes posted on the MOH website and avian flu website for downloading and use by media that cannot attend the media conference in person (Media Unit).
- Assistance given to the minister to deal with media inquiries or announcements (Media Unit).
- Close liaison with public affairs counterparts in other agencies.

Phases: Overseas 6, Bahrain 6a, Bahrain 6b, Bahrain 6c and Bahrain 6d

At this stage media management and communications with the public will be intensified. Actions will include:

- Activation of an expanded media liaison team including coopting emergency trained public affairs officers from other agencies and the private sector (Media Unit/Communications Branch).
- Deployment of media liaison officers to key trigger points, such as where antivirals are being sent, areas quarantined etc.
- Briefing media editors about an orderly flow of information, including setting clear guidelines for media access to the PHR and Disease Control Section with one main media conference per day, with transcripts and sound bytes posted on the MOH website and avian flu website (Media Unit).
- Utilising the media centre for emergency management if required.
- Enlisting the services of Bahrain Associated Press as a one-stop shop information service.
- Enhanced media monitoring.
- Working closely with the National Emergency Media Response Network (NEMRN) including medical colleges and associations.

4. National Emergency Response Network (NEMRN)

In an effort to spread the message widely, the Media Unit, which supports the PHR, has formed an information sharing network comprising media liaison managers in all health departments

The public affairs officers of all medical colleges and associations are a vital part of this network. The network, which works closely with similar public health, emergency services and national security media liaison groups, meets regularly and holds exercises and workshops to continually refine coordinated public and media responses about new and emerging health crises. NEMRN will play a vital role in informing the public and media during a pandemic.

Phases: Overseas 1, Overseas 2, Overseas 3, Bahrain 0, Bahrain 1 and Bahrain 2

In this period the NEMRN is consulted on a range of health emergencies for Avian influenza vaccine delay and other issues as they emerge. Contact includes:

- NEMRN involvement in emergency health exercises with the PHR and Disease Control Section (Media Unit).
- Keeping in touch on a regular basis about significant health issues that may need a media response, via email (Media Unit).
- Holding teleconferences of NEMRN to coordinate responses during health emergencies.
- Keeping in touch by phone or email on a bilateral basis as the need arises.
- Involving only health public affairs people if appropriate, or the whole network as required.
- Ensuring that members of NEMRN are linked in with other media liaison networks such as Ministry of Municipalities & Agriculture Affairs, A/E and the national security media.
- Holding of exercises and face to face meetings.
- Coordination of influenza pandemic communications plans.

Disease Control Measures (contd.)

Phases: Overseas 4, Overseas 5, Bahrain 3, Bahrain 4 and Bahrain 5

During this phase the role of NEMRN will be vital as the coordinated management of messages to the public and the media will be crucial. Actions to involve the network at this stage would include:

- Daily teleconference of the whole network and additional ones with the Health representatives only if required.
- Daily distribution of relevant information via email.
- Coordination of website information by all jurisdictions.
- Clear decisions on which jurisdiction is the spokesperson for the health emergency, or how the media response should be divided up.
- Activation of conference text messaging service for all members of NEMRN (Media Unit).

Phases: Overseas 6, Bahrain 6a, Bahrain 6b, Bahrain 6c and Bahrain 6d

In this phase it will be essential for the NEMRN to:

- Activate coordinated influenza pandemic communications plans.
- Hold daily teleconferences.
- Share of information via email.
- Provide assistance by the Media Unit during public health measures.

5. Educational resources

A range of educational resources has already been produced, including for Doctors, to help doctors and the public prepare for an influenza pandemic. Additional artwork, display stands, a media buying plan and priority printing arrangements are in place to scale up public information resources as required.

Phases: Overseas 1, Overseas 2, Overseas 3, Bahrain 0, Bahrain 1 and Bahrain 2

Resources developed include:

- Incoming Passenger Pamphlet.
This pamphlet is a generic respiratory health alert publication which is being given to all incoming international passengers to Bahrain
- Information Kit for HCWS In the event of a pandemic influenza, the public will rely heavily on their doctors and to assist health care professionals in the private sector to prepare, an information kit is being available in the avian flu website as a reference to every doctor outlining precautionary actions along with instructions on what to do in a health emergency. The kit comprises an instructional brochure, posters and fact sheets.
- DVD on Personal Protection.
A DVD on how to correctly fit personal protective equipment. The main purpose of the DVD is to train those people without clinical training, like border workers and family physicians, about how to prevent the spread of infectious diseases such as influenza. Posters for the public about infection control to be displayed in doctors' rooms.

Disease Control Measures (contd.)

- Avian flu educational brochures have been printed. 50,000 copies in Arabic and 5,000 in English for public.
- Avian Flu website www.ai.moh.gov.bh.

Phases: Overseas 3, Overseas 4, Overseas 5, Bahrain 3, Bahrain 4 and Bahrain 5

Additional resources, on standby, will be produced to improve surveillance and heighten the public's awareness about the need for health vigilance. These include:

- Health declaration card
Copies of a more comprehensive health declaration card to be printed in several languages to be issued to incoming passengers.
- Displays
Art work for displays and health warnings at airports and sea ports to be developed and to be produced to impart important health messages to the public.
- Media buying plan
A media buying plan will be activated to place advertisements and health messages in media as required.
- Fact sheets
Fact sheets informing the public about personal protection, infection control and actions they should take to limit their exposure to influenza will be developed and posted on the web and be distributed through shopping centers, public places, schools and by fax or post.

Phases: Overseas 6, Bahrain 6a, Bahrain 6b, Bahrain 6c and Bahrain 6d

Actions in this phase to include:

- Developing fact sheets appropriate to the health situation for wide distribution through shopping centres and other community outlets, on the website and available by fax or post on request.
- Activating the pre-arranged media buying plan, in conjunction with other agencies like BQIS to secure advertising space in the media for important health warnings or messages.
- Recording special broadcasts and video providing advice to the community on current public health arrangements including quarantine restrictions if required.

6. International collaboration

The PHR response team will facilitate international teleconferences with global authorities and other agencies as needed.

7. Stakeholder engagement

Stakeholder engagement beyond Government and CDN is critical in both the containment and maintenance phases to achieve maximum cooperation and communication across the health and community sectors. Responsibility for implementing the Bahrain management plan will lie with health services, emergency services and governments at all levels. The media, wider community and

industry also have key roles to play in ensuring a responsible national response.

The PHR will convene meetings of peak national stakeholder groups in the process of developing the pandemic plan and during the pandemic as needed. Stakeholder representation will include:

- Medical practitioners: Medical Colleges, emergency physicians, medical administrators, specialist groups in respiratory medicine, infectious diseases, thoracic surgery, intensive care.
- Consumers:
 - o Nursing.
 - o Public health.
 - o Pharmacists.
 - o Non governmental hospital sector.
 - o Laboratory and mortuary staff.
 - o Funeral directors.
 - o Education sector.
 - o Religious Leaders

Additionally, a stakeholder engagement strategy will be developed to ensure that other key community groups are engaged in the wider community education and dissemination of information.



CHAPTER 4

Epidemiology of influenza

Origin of the Pandemic

- The pandemic will be due to a new subtype of influenza A and its emergence is inevitable.
- There are 15 haemagglutinins (HAs) which exist and all can infect birds. So far, H1, H2 and H3 have been associated with widespread human disease and it is known that at least H5, H7 and H9 have the potential to cause human disease, and particularly severe disease from H5N1.
- The avian influenza viruses will infect people directly exposed to infected poultry, but they may not necessarily evolve into potential pandemic strain.
- A new virus may be a re-emerging previously known human virus subtype which has not recently been in circulation, or a virus of avian origin, emerging either through stepwise 'adaptation' conferring greater affinity for humans or through a process of genetic 'reassortment' between the genes of an avian and a human virus.
- A new strain is likely to transmit more easily to people if it contains genetic material from a human influenza virus.
- Such a strain could first emerge anywhere but is most likely to emerge in the Far East because of the close proximity of humans, ducks, other poultry and domestic pigs in farming communities facilitating mingling of human and animal viruses resulting into a new 'reassorted' strain. The viruses may also re-emerge from unrecognised or unsuspected reservoirs.
- False alarms are likely and investigations of suspect cases will inevitably consume resources.

Timing of the Pandemic

- A future influenza pandemic could occur at any time.
- A new virus may not follow the usual seasonal pattern of influenza, and may occur at any time of the year.

Geographical spread

- In the event of a novel influenza virus causing significant outbreaks of human illness elsewhere in the world, it is highly unlikely that importation could be prevented; even closing all borders is likely only to delay the importation.
- Spread from an origin in Asia is likely to follow the main routes of travel and trade.
- Spread from the source country through the movement of people is likely to take less than 3 months and experience of the spread of SARS from Hong Kong suggests modern travel may result in wide international spread even more rapidly than this estimate.

Duration of the pandemic

- Based on other countries' experiences the influenza activity within a country may last for 3-5 months, depending on the season.

Infectivity & mode of spread

- There may be subsequent waves of the pandemic, weeks or months apart.
- Influenza is mainly spread by the respiratory route, through droplets of infected respiratory secretions or by fine respiratory aerosols produced when an infected person talks, coughs

or sneezes; it may also be spread by hand/face contact after touching a person or surface contaminated with infectious respiratory droplets (fomites).

- Cases are highly infectious from the onset of symptoms for 4 to 5 days (longer in children and people who are immunocompromised). 10% of these are likely to be infectious before the onset of symptoms.
- Children have been shown to shed virus from 6 days before to 21 days after the onset of symptoms.
- The incubation period is 1-3 days
- Without intervention one person infects on average about 1.4 people (basic reproduction number). This number is likely to be higher in closed communities.

The extent & severity of illness

- Important differences in the age distribution, extent and severity of illness are likely compared with annual seasonal influenza, but will not be known until person to person transmission is taking place.
- Most people will be susceptible, although not all will develop clinical illness. Previous experience suggests an equal number will be asymptomatic.
- For planning purposes the most likely scenario, based on previous pandemics in the 20th Century, is a cumulative clinical attack rate of 25% of the population (figure advised by WHO) over one or more waves of around 12 weeks each, weeks or months apart. This compares with a usual seasonal influenza attack rate of 5 - 10%. Ten percent and 50% clinical attack rates have also been considered. The second wave may be the more severe.
- All ages will be affected, but children and otherwise fit adults could be at relatively greater risk. For planning purposes, a uniform attack rate has been used for all age groups.
- If working age adults are predominantly affected this will impact more seriously on provision of services and business continuity, while illness in the very young and the elderly is likely to present a greater burden on the health services.
- More severe illness than the usual seasonal influenza is likely with severe prostration and rapidly fatal overwhelming viraemia, pneumonia or secondary complications.

Mortality

- Mortality due to influenza pandemic is expected to be higher than during the interpandemic period.

Impact of the Pandemic on Health and Social Services

The impact of a flu pandemic on health and social services is likely to be intense, sustained and nationwide; both services may quickly become overwhelmed as a result of:

- The increased workload of patients with influenza and its direct complications.
- The particular needs for high dependency care and infection control facilities and equipment.
- A secondary burden on health caused by anxiety and bereavement.
- Depletion of the workforce and of numbers of informal carers, due to the direct or indirect effects of flu on themselves and their families.
- Logistical problems due to possible disruption of supplies, utilities and transport as part of the general disruption caused by the pandemic.

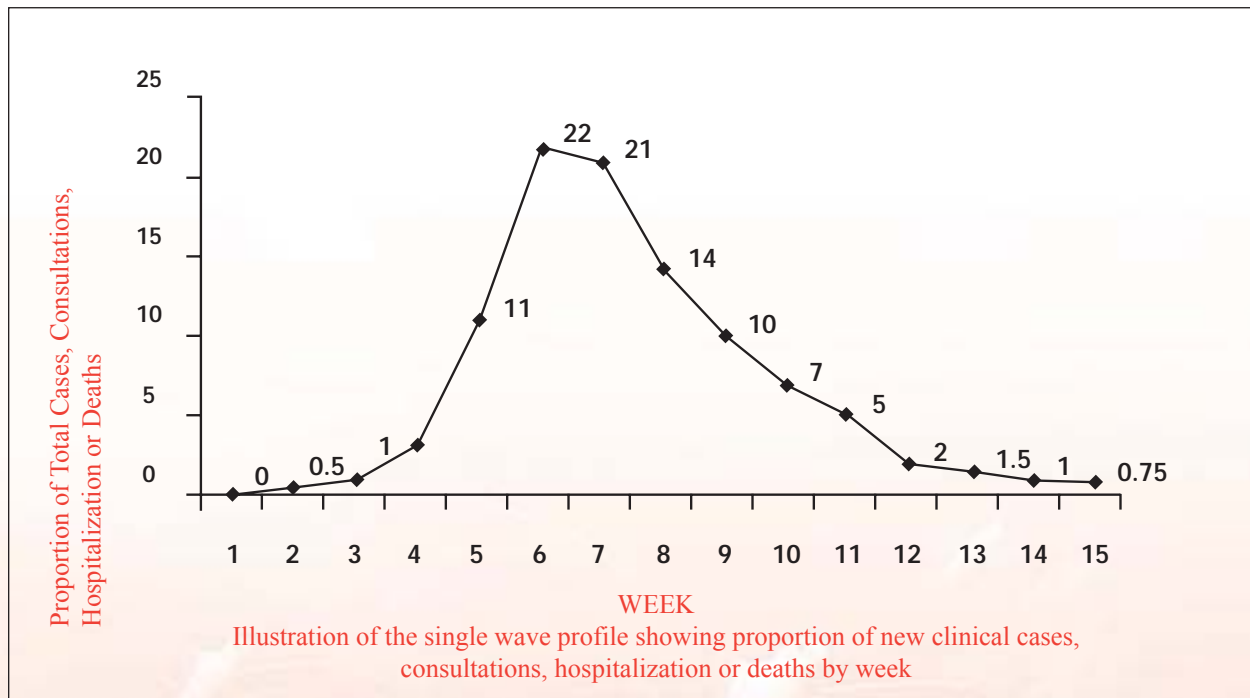
- Delays in dealing with other medical conditions.
- The longer term macro effects of the pandemic on the national [and world] economy.
- Innovative approaches will be needed to many aspects of health care, including staffing, triaging of patients and coping with those patients needing more intense care than is normally possible at home but who may not be able to be admitted to hospital.
- There will be pressure on mortuary facilities (possibly exacerbated by delays in death registrations and funerals).

a) Contacts with health care and potential need for hospital admission

- The estimates of anticipated cases, health care contacts, primary care consultations, A&E visits, hospital admissions and deaths (again based on a uniform attack rate across all age groups) should be done.
- Primary 'health care contacts' refer to the equivalent of doctors consultations in normal (i.e non-pandemic) periods. In the pandemic period it is assumed that all those with clinical symptoms would present for treatment, both because of concerns about the illness and because the strategy, if possible, will be to treat all those with clinical symptoms with antiviral drugs. The demand on doctors and pharmacies will be at the height of the pandemic, some form of alternative provision will be required.
- Total health care contacts influenza-like illness could increase during the pandemic 15 times than during than the period of a 'normal' season.
- New health care contacts for influenza-like illness can be expected to exceed during the main pandemic period.
- Assuming a complication rate of 10%, with half of those who experience complications consulting doctors.
- For children over 1 year but under 24 kg, antiviral will only be available on prescription. The majority of such children with clinical symptoms would need to visit a doctors. This group represents approximately 5% of the population.
- Similar numbers to those with complications seen by doctors might be expected to attend hospital A&E departments.

Hospital admissions for acute respiratory and related conditions are likely to increase by at least 50% with new patients requiring hospitalization at the peak. Again, in the absence of pandemic data, these are projected from current hospital admissions for influenza which are the minimum to be expected in a pandemic. Demand for treatment for those with complications might be up to ten times higher, similar to those indicated for A&E consultations. Hospitalisations and deaths are likely to be greatest if the highest attack rates are in the elderly. The lowest burden on health care might be associated with higher attack rates in adults aged 15-64 years.

- A short sharp epidemic would put greater strains on services than a lower level but more sustained one.
- Antiviral treatment should reduce the size of the peak, the severity of the illness and possibly the total numbers of those with clinical symptoms. However, the extent of these reductions is difficult to predict.



b) Workforce issues

All organisations may be affected by staff absence because of sickness, the need to take time off to care for others, or the fear of contracting pandemic influenza. This will occur at a time when, for some organizations, the workload may be greater than normal.

There will be a very important pool of health care (and other) workers who contract the disease but survive and hence become immune. If a database of these individuals was kept, perhaps in each hospital, it would make staffing front-line areas such as emergency departments easier. Also, this group would not require vaccination when it did eventually become available, thereby easing the pressure on vaccinating the remaining non-immune population.

Consideration of this issue should include:

- Establishing minimal staffing levels.
- The need for staff to work in areas they are not formally trained in.
- Utilising volunteers, retired or 'trainee' staff (eg medical and nursing students) .
- Accommodation for staff in between shifts, when transport home may be disrupted or not advised.
- Psychological support for staff.

Particular issues for staff with occupational exposures to pandemic influenza and other essential

workers who may be provided with antivirals and PPE include:

- Monitoring of staff for illness and adverse reactions to antiviral medications.
- Implementing rotations of staff on antivirals.
- Supervised and recorded dosing of antivirals.

c) Absence from work

- Work patterns have changed so much since previous pandemics that it is unwise to extrapolate from historical data on sickness absence.
- Absence from work will depend on the age-specific attack rate, although even if working age people are relatively spared, additional absenteeism may result from staff needing to take time off to care for family members, or difficulties with transport.
- Accelerated transmission may occur in the workplace, resulting in staff being ill during a narrower time frame than in the general population.
- It is suggested that business continuity plans are based on a cumulative total of 25% of workers taking some time off – possibly 5-8 working days – over a period of 3 to 4 months.
- Modelling suggests absenteeism due to the pandemic will rise to a peak of 5-7%, the higher number including those who would need to look after those who are ill. This equates to about three times the normal average absenteeism in a private sector company and double that in the public sector. Even in the reasonable worst case of a 50% attack rate these figures only rise to 10-15%. However the absenteeism rate would not be uniform and some employers may be particularly badly affected.
- In the absence of vaccination, those in occupations with particularly high exposure such as health care workers will have higher absenteeism.
- The skill mix required in some occupations, including health care, may limit the extent to which other staff can be redeployed.

d) Schools and other closed communities

- Influenza will spread rapidly in schools. In 1957, for example, up to 50% of school children developed influenza, but even those schools which were most severely disrupted had returned to normal 4 weeks after the appearance of the first case. In residential schools, attack rates reached 90%, often affecting the whole school within a fortnight. This will impact on working parents.
- However, closing schools has a significant impact on business continuity and maintenance of essential services, particularly health care, due to parent workers needing to stay at home for childcare.
- Similar spread is likely in other closed communities such as residential care facilities, barracks and prisons.

e) Impact on other services

- In the absence of early or effective interventions, there will be an effect on all other services, through staff sickness, any travel restrictions imposed and through the knock on effects of other disrupted businesses and services.
- This includes all non-health 'first responder' services (police, fire etc), the military, other essential services (eg utilities, fuel supply, food production and distribution, transport), prisons, education and businesses.
- Services such as death registration and funeral directors will have an increased work load.
- In addition to maintaining continuity of their work, badly affected businesses will need to consider, for example, the security of premises, including manufacturing plants.

f) Impact on travel

- Travel will be impacted through:
- Any explicit advice or restrictions on travel and public gatherings as a policy option.
- People opting not to travel (eg because of cancellation of work/school etc, fear of acquiring infection through travel or fear of leaving home).
- Availability of fuel and transport workers.

g) Public, political and media concern

- There will be high public and political concern and scrutiny at all stages of an influenza pandemic.
- Press interest, need for information and coverage will be intense.
- Managing people's concerns and expectations will be a key part of the response.
- People's concerns will extend to what is happening in other countries, particularly those with which they have family connections.

Interest and concern will also extend to national and international events and mass gatherings.

Extent to which Interventions Might Ameliorate the Impact

- vaccination with a vaccine specifically formulated against the pandemic virus strain, when an appropriate vaccine becomes available, can be expected to achieve the greatest reduction in illness, complications and deaths, and lessening of the impact on health and other services, although the effectiveness of a pandemic vaccine will not be known until it is in use. Even in inter-pandemic years, when the virus strains predicted to be circulating the following winter, and included in the vaccine, are well matched to those which actually do occur, vaccine reduces infection by around 70-80%, hospitalizations in high risk individuals by around 60% and deaths by around 40%.
- Much work has been done on the most effective strategies for the use of antiviral drugs. If treatment with antiviral drugs provides benefits of the same order as those demonstrated during seasonal influenza, early treatment (within 48 hours of onset of illness) should shorten illness by around one day, reduce the severity of the symptoms, and reduce the need for hospitalisation. If, as planned, it is possible to treat all those with clinical symptoms, there should be a reduction in the number of hospitalisations needed (by around 50%), and deaths, and possibly in the size of the peak and the total numbers affected.
- However, the effectiveness of antivirals in a pandemic, and particularly in reducing mortality in cases of severe disease (including primary viral pneumonia), is not known. Predicting precisely how large these effects would be is impossible with current information.
- The amount of antiviral drug required if it were to be taken to prevent people getting the disease over the entire pandemic period is prohibitive and a treatment strategy is the only realistic option, other than in some very specific circumstances.
- International travel restrictions and screening passengers on entry to Bahrain would only have a very limited impact on the arrival of pandemic influenza in Bahrain. Only in some very special situations would it be possible to use travel restrictions to delay arrival by any significant period.

Surveillance

Introduction

Timely, up to date surveillance and other information are needed by a variety of audiences at all levels (eg local regional, national) in order to provide evidence based risk assessments and policy advice and to inform decision making at all phases of the response.

Information needs during a pandemic will be more demanding than routine influenza surveillance or other monitoring systems currently provide for. For instance, Government will need regular timely information on the extent and impact of the pandemic across the whole country; the mathematical modelers will need timely, early data in order to refine their estimates of the impact; public health policies may need to change emphasis; and guidance to clinicians may need to change. A key action in the inter-pandemic period is therefore to understand the data requirements of the key players, so that, as far as is practicable, they can be fulfilled at the time. This presents technical challenges, and may put additional burdens for data provision, collection, collation and dissemination on people whose main priority is delivering health or other care. 'Customers' of surveillance information need to understand the possible constraints in providing it. An underlying principle is that data collections are rationalized at local, regional and national levels, to avoid unnecessary duplications.

International surveillance

Surveillance for influenza starts with good internationally coordinated monitoring of prevalent influenza viruses worldwide and the illness due to them, primarily to inform routine vaccine production but also to assess their virulence and antigenic diversity. Bahrain contributes to this surveillance, which is coordinated, for human influenza, by the World Health Organization, and for animal influenza, by the Office International Epizootic (OIE).

Bahrain surveillance

a) The strategic goal of surveillance

To provide integrated response to an influenza pandemic, with clear step wise response at all levels. The surveillance response is based on phases as currently defined by the World Health Organization (WHO) which trigger public health action.

b) The objectives to achieve the strategic goal of the surveillance are to:

- To ensure optimal coordination, decision-making, and communication between different sectors.
- To detect influenza strains through clinical and virologic surveillance of human and animal influenza disease.
- To implement a vaccination program that rapidly administers vaccine to priority groups and monitors vaccine effectiveness and safety.
- To deliver antiviral drug therapy and prophylaxis and avoid inappropriate use of these agents, which may result in antiviral resistance.
- To implement measures to decrease the spread of disease guided by the epidemiology of the pandemic.

- To communicate effectively with the public, health care providers, community leaders and the media.
- To combine epidemiological, virological and other data from a wide variety of sources, with the aim to:
 - To monitor prevalent viruses, and the disease due to them.
 - To make a full contribution to international influenza surveillance through the WHO.
 - To identify a novel virus at the earliest opportunity (including in birds or mammals):
 - o To characterize the virus.
 - o To inform vaccine development work.
 - o To enable possible early interventions to delay or slow its spread.
- To monitor any changing characteristics of the virus in order to adapt policies (including vaccine recommendations) if necessary.
- To co-ordinate with animal health surveillance to assess the risks of a new human or mammal/bird influenza virus crossing species.
- To identify clusters of unusual respiratory illness that may be caused by a new virus.
- To monitor the spread of a new virus and define its epidemiological features, for example, the type and severity of illness and the impact in different age or population groups to inform planning and policies.
- To provide information on significant outbreaks.
- To monitor the microbial causes, and antimicrobial susceptibility, of complications to inform treatment policies.
- To monitor deaths.
- To monitor the uptake and effectiveness of any interventions (including possible adverse reactions).

It is recognized that the objectives of surveillance will change as the proportion of isolates, including all unusual ones from the whole of the country, referred to the National Influenza Reference Laboratory for detailed identification.

- To promote the Laboratory capacity to:
 - To maintain laboratory methods at the cutting edge.
 - To develop and maintain reagents for routine and reference laboratory diagnostic tests.
 - To ensure a surge capacity in virology laboratories at local and reference levels in the event of a pandemic.
 - To develop and maintain capacity for antiviral susceptibility testing.
 - To ensure a surge capacity for bacteriological diagnosis of complications of influenza.
 - To ensure laboratory staff protection and compliance with all necessary biosafety and security requirements.

c) Building blocks for pandemic (planning)

A critical part of pandemic planning is ensuring that the building blocks are in place ahead of an actual pandemic threat. Thus, Bahrain's preparedness for a pandemic rests on a number of major strategic measures including:

- ensuring Bahrain has the laboratory capacity and capability to allow rapid and accurate identification of emerging subtypes, including appropriate biosecure facilities and national guidelines for the handling and testing of specimens.

- instituting and maintaining appropriate national surveillance activities to ensure early detection of virus subtypes in both animal and human populations.
- consideration of border control measures with the aim of preventing pandemic spread into Bahrain.
- consideration of social distancing measures that may need to be implemented in a pandemic.
- building a pandemic therapeutic “armamentarium” through development of the National Medicine Stockpile (NMS) containing antiviral agents, Personal Protection Equipment (PPE) and other equipment required in a pandemic.
- ensuring health services can be adequately maintained in the face of a pandemic.
- preparedness for pandemic vaccination development and administration.
- development and implementation of a detailed communications strategy for all phases.
- providing advice and assistance in the event of a pandemic to Bahrainis travelling or residing overseas.
- maintaining the A/E room to facilitate a rapid response to national health emergencies.
- ensuring that appropriate decision making bodies are in place and have the necessary expertise and authority to make decisions quickly and effectively in the face of rapidly developing situations.
- Ensuring an adequate civil emergency response can be implemented in region.
- Developing the evidence base for decisions, such as implementation of quarantine measures, that need to be considered in a pandemic, including targeted research projects to address gaps in current knowledge.
- Close collaboration with regions to develop action plans that achieve national consistency and coordination of effort.

d) Components of surveillance

1. Monitoring influenza-like illness (ILI)

There are 21 health centers practice surveillance schemes that monitor influenza.

2. Surveillance of laboratory-confirmed influenza through the National Notifiable Diseases Surveillance System (NNDSS)

Laboratory confirmed influenza is a notifiable disease in all Bahrain and data are sent daily to communicable diseases unit.

3. Laboratory surveillance

Surveillance of influenza isolates and identification of novel strains will occur through the coordination of public health laboratories and the WHOCC for Influenza. Pandemic strains will be isolated at the WHOCC.

4. Data collection on possible and confirmed cases of pandemic influenza

The Ministry of Health has a web-based database for collection of demographic, clinical, laboratory and epidemiological data on each possible and confirmed human case of pandemic influenza. The collection of data will be directed by the WHO recommended case definition which will be adapted for emerging clinical features of pandemic influenza, the phases of the pandemic and for Bahrain requirements.

5. Passive reporting of unusual clusters of ILI or acute respiratory disease

Hospitals and health centers will be encouraged to report any unusual clusters of cases of influenza-like illness or other acute respiratory disease to Communicable Diseases Unit (CDU). The significance of these clusters will be determined.

6. Border screening for ILI in travelers from pandemic influenza affected regions

Passengers with fever arriving from affected countries will be referred for examination by nurses and, if necessary, by the CQO. Suspect cases may be hospitalized for examination and management. Health declaration cards for incoming passengers will be implemented to detect human cases of avian influenza once human to human transmission has been confirmed.

7. Hospital based surveillance during pandemic, including mortality

Hospital surveillance will cover a range of surveillance activities, shown in the following table. These activities will be undertaken during the pandemic phases only, with the exception of detection of ILI in health care workers (including laboratory workers), which will occur in the pandemic alert phases.

8. Studies to measure effectiveness of, and adverse events associated with, antiviral and vaccines

Studies will be undertaken in HCW as a proxy for all at risk groups, given HCW are a readily accessible population group. Vaccine effectiveness of pandemic vaccines will be assessed by studies in health care workers. In vitro testing of the effectiveness of antiviral drugs against circulating pandemic influenza strains will be carried out throughout the pandemic. Adverse events associated with consumption of antiviral drugs or administration of new influenza vaccines will be measured in health care workers receiving these prophylactics.

9. Monitoring absenteeism of essential services personnel

Essential service will monitor absenteeism rate to ensure adequate staffing to maintain services throughout a pandemic.

Hospital Surveillance During Pandemic Phases

Type of hospital	Objectives	Data, type and frequency
Surveillance of A/E presentation of influenza-like illness and acute respiratory illness	<ul style="list-style-type: none"> To monitor presentations of ILI as a proxy for influenza activity To assess hospital workloads 	Rate of ILI as presenting symptom / 1,000 presentations; daily.
Admissions of influenza and pneumonia cases	<ul style="list-style-type: none"> To assess admission rates as a proxy measure of respiratory disease To assess hospital workloads 	Admissions with diagnosis ICD-10 J10 To J18 per day
ICU bed occupancy by influenza and pneumonia cases	<ul style="list-style-type: none"> To assess admission rates as a proxy measure of severe respiratory disease To assess critical hospital capacity 	Daily ICU bed occupancy by patients with primary diagnosis ICD-10 J10 - J18.
Death in Hospital from influenza or pneumonia	To rapidly assess mortality rates in a pandemic	Weekly collation of deaths.
Health care worker (HCW) ILL of respiratory illness	To assess HCW (including laboratory workers) at risk of infection with pandemic influenza	<ul style="list-style-type: none"> Presentation to staff clinics of ILI Rates of ill staff at designated 'fever' Hospitals
HCW absenteeism	<ul style="list-style-type: none"> To assess impact of pandemic influenza on hospital services To inform redeployment of HCW to cover shortages 	Daily absenteeism rate (3 consecutive days or more) per 100 employees

e) Types of surveillance

Surveillance Type	Responsible Area
1. Human influenza disease surveillance	Communicable diseases unit at the Diseases Control Section in the Public Health
2. Veterinary surveillance	Ministry of Municipality and Agriculture Affairs
3. Laboratory surveillance	Public health laboratory
4. Information dissemination	Ministry of Health Avian Flu Committee
5. The public health response	MOHAFC

1. Human Influenza Disease Surveillance

Timely surveillance information will be the key to early identification of an influenza pandemic, and to the development of evidence based interventions at all stages.

The objectives of surveillance will change as the pandemic evolves and the different phases will trigger enhancements - such as closer monitoring of particular population groups, including laboratory workers - or changes in emphasis.

Monitoring influenza disease activity is important to facilitate resource planning, communication, intervention, and investigation. Current influenza surveillance system will provide the foundation for surveillance during a pandemic. Recent enhancements include updating data transmission systems to provide real-time reporting on a weekly basis and monitoring data at the sub-national level. A high level of vigilance for clusters of cases of respiratory disease provides an early warning mechanism.

Influenza is a common condition and has symptoms similar to those of many other viral respiratory infections. Early detection of a new virus therefore requires clinicians as well as laboratory staff to be alert to the possibly unusual, for example respiratory illness in a patient, with a link to areas where a new virus has been already identified, or to poultry farming and to report these unusual events promptly.

The strategies are:

- To identify clusters of unusual respiratory illness that may be caused by a new virus.
- To monitor the spread of a new virus and define its epidemiological features as a pandemic progresses, epidemiological surveillance must adapt to provide adequate information on the type and severity of illness, its spread, and the impact in different population groups, in order to inform policy and planning.
- To monitor the causes, and antimicrobial susceptibility of complications to inform treatment policies.
- To monitor the overall impact on health services and other parameters. This will require collation of information outside that usually regarded as 'surveillance', for example hospital admission data, absenteeism data, but nonetheless essential to assessing the impact of the pandemic.
- To monitor the uptake and effectiveness of any interventions (including possible adverse reactions).
- To monitor any changing characteristics of the virus In order to adapt policies (including vaccine recommendations) if necessary.
- To coordinate with veterinary surveillance to assess the risks of a new human or mammal/bird influenza virus crossing species.

Public Health Implementation Plan (contd.)

- To establish a case based field information management system that links epidemiological and laboratory data.
- To disseminate a wide range of surveillance information, including monitoring of vaccine uptake and the impact of interventions.

2. Veterinary surveillance

A pandemic influenza virus strain is likely to arise from re-assortment of animal and human influenza viruses. Therefore, coordination of surveillance with the Ministry of Municipality and Agriculture Affairs is critical. Outbreaks in domestic poultry associated with cases of human disease highlight the importance of coordinating these surveillance activities.

Surveillance for influenza viruses in poultry in Bahrain has increased substantially since the outbreak of highly pathogenic avian influenza (HPAI).

3. Laboratory Surveillance

Laboratories are essential to confirm diagnosis, elucidate of characteristics of the virus, and to overall surveillance. The capability and capacity of the Public Health Laboratory to identify novel influenza strains should be evaluated.

A proportion of isolates, including all unusual ones from Bahrain, should be referred to the International Influenza Reference Laboratory, at WHO- EMR, Cairo for detailed identification.

Once a pandemic is established, laboratory surveillance will map the evolution of the virus, its antiviral susceptibility, and the causes and antimicrobial susceptibility of bacterial complications.

During pandemic the virological surveillance strategy should be expanded covering following areas:

- Maintaining laboratory methods of high standards and increasing capacity.
- Developing and maintaining reagents for routine and reference laboratory diagnostic tests.
- Surge capacity for bacteriological diagnosis of complications of influenza.
- Develop capacity for antiviral susceptibility testing.
- Laboratory staff protection and compliance with all necessary biosafety and security requirements.

4. Information Dissemination

On being informed by the WHO of the isolation of a new influenza virus with pandemic potential (when effective person to person spread has been confirmed), the Focal Point (Chief of the diseases control section will immediately convene a meeting of the committee).

As soon as the WHO confirms the onset of a likely pandemic the preparedness plan will be activated and the Ministry of Health will immediately cascade the information to all levels of health care in Government and private sector.

Effective communications provide the backbone for an effective and coordinated response. A wide range of groups at all levels will need accurate, timely and consistent information and advice, and rumours and misinformation will abound. Inevitably, the media will sometimes report information before it can be confirmed through official channels. The information to be exchanged will concern currently known facts, assessments of the risks and the public health relevance, and information and advice to help manage those risks, at all stages of the pandemic.

The overall communications strategy covers the gathering, collation and dissemination of information for a variety of audiences, which can be divided broadly into:

- Strategic communications

Two way strategic communications will involve the MOH, and all other governmental agencies and organisations involved in the response, including the private health establishments and the international agencies. The Government briefings and public information will be controlled and monitored once a pandemic is declared.

- Professional information and guidance

Regular information bulletins to the health professionals will be issued as required, and as urgency indicates, via already established routes. Up-to date information on clinical guidance and public health advice will be maintained on the Avian Flu website.

- Communications with the public and the media

Communication both before and during a pandemic is a key element of the response, with emphasis in the inter pandemic period on the uncertainties and the constraints faced by Governments in preparing their response. Clear, active engagement of the public will be a priority throughout a pandemic, through:

- Regularly updated information and advice.
- Sharing the advice of expert groups with the public.
- Briefing the specialist media on the preparations and plans.
- Establishing focus groups to help identify public concerns.

Media communications will be co-ordinated initially by the MOH, Public relation office and the Diseases Control Section. They will also co-ordinate cross government communication and depending on the scale will also co-ordinate the media and public communication for the other sectors involved.

5. The public health response: reducing the impact of Avian influenza Pandemic

The ability of containment strategies to substantially slow the spread of pandemic influenza may be limited by the short incubation period for influenza, the large proportion of asymptomatic infections, and the non-specific nature of clinical illness from influenza infection. These challenges may lead to difficulty in identifying infected persons, quarantining contacts of infected person prior to onset of illness, and marshalling the substantial resources that would be needed to initiate and monitor the use of containment measures. Nonetheless, during early stages of a pandemic, particularly if the novel influenza virus is not efficiently transmitted, use of containment measures may help to slow the spread of a pandemic influenza A virus and allow additional time for the development and use of a vaccine and the production and use of antiviral medications.

The public health response covers the application of population control measures. It also includes the field investigation, handling and feedback of information from suspected incidents and outbreaks by appropriately trained personnel, using appropriate protocols and proforma. The results of epidemiological investigations need regular review to redefine the protocols and develop or adjust the recommendations to prevent or control the (further) spread of the disease. Public health control measures are broadly 'medical' (vaccination, and the use of antiviral drugs) or 'social' (personal hygiene and 'social distancing' measures to reduce transmission or slow the spread of infection.

Immunisation

In inter-pandemic years, immunization is the cornerstone of influenza prevention. Production of an appropriate vaccine is possible each year because of scientists' ability to predict the strains of virus most likely to be circulating that year. These routine vaccines will not protect against a pandemic evolves. The different phases will trigger enhancements – such as closer monitoring of particular population groups, including laboratory workers – or changes in emphasis. Flexibility will therefore be maintained in the indices collected as pandemic progresses.

Surveillance information, including monitoring of vaccine uptake and the impact of interventions, will be disseminated to a wide range of people to inform practice and planning.

Situation reporting

The routine Reports to the Public health of will be used in a pandemic to monitor the impact on health services and inform operational planning.

Measures to improve surveillance

- Maintain alertness among clinicians and virologists to recognize the unusual clustering. Influenza is a common condition and has symptoms similar to those of many other viral respiratory infections. Respiratory illness in a patient with a link to areas where a new virus has been already identified, or to poultry farming, should be reported promptly and has developed a protocol for investigating such patients.
- Increase the coverage and frequency of reporting from general practice-based surveillance.
- Establish a case based field information management system that links epidemiological and laboratory data.
- Establish a real-time system to monitor vaccine efficacy.
- Include monitoring of long term health sequelae of infection with a pandemic strain of influenza virus.
- Microbiology and virology laboratories confirm diagnoses, elucidate the characteristics of viruses, and are essential to overall surveillance.

Measures to reduce morbidity and/or contain spread

- In the event that medical countermeasures are absent, limited supply, or ineffective, other 'social' interventions will be the only available countermeasures.
- During the outbreaks of Severe Acute Respiratory Syndrome (SARS) in 2003, internationally agreed measures were instituted to restrict the movement of people possibly infected with SARS and were assessed by WHO to have greatly contributed to bringing the disease under control.
- Avian Influenza differs from SARS in many important respects that make it unlikely that similar interventions will do more than delay or slow the transmission of infection: it is more infectious. It is most infectious early in the course of the disease (and possibly even before symptoms begin); and it has a much shorter incubation period (1- 3 days). At this time, the extent to which the spread of influenza can be delayed or slowed by measures to reduce infected and non infected people mixing is not clear, and what may be reasonable at an early phase may not be once the pandemic is fully established. However, simple advice such as hand washing, encouraging people suffering from the disease to stay at home and reducing unnecessary, especially long distance travel may achieve some slowing of the spread of a pandemic.

- The following public health measures, and the need for infection control guidelines in non medical settings where people gather, are being reviewed.
- Clear guidance will be issued, based on the advice of the WHO or as need arises:
 - Hygiene including respiratory hygiene and hand washing.
 - Travel advisories to restrict international travel to or from affected areas.
 - Health screening at ports.
 - Voluntary home isolation of cases.
 - Voluntary quarantine of contacts of known cases.
 - Staff rostering to minimise contact between different healthcare teams and reduce spread within healthcare premises. This may also reduce the impact on staffing if all contacts of a case in a work team are asked to remain in voluntary quarantine.
 - Local restrictions on the movement of people, e.g. in a local community or town.
 - Restriction of public gatherings, especially international mass gatherings.
 - School closures (recognising the impact this will have on maintaining the workforce in other sectors).
 - The use of face masks by infected people (to reduce droplet spread), by those in contact with infected people or by the general public.

Some of these measures may be required as a result of staff absence or the general disruption, or may occur by default because of public concern or other considerations. Voluntary cooperation with recommended measures would be sought. Mandatory quarantine and curfews are generally not considered necessary and are not currently covered by public health legislation.

Reducing social disruption

This plan is mainly concerned with the health response to an influenza pandemic, but health services will be looking to other Ministries and other agencies to assist with the successful implementation of the health response, particularly to implement the 'social countermeasures referred to above which may be needed as public health measures. Additionally, all organisations, including businesses, need to consider the implications for their organisations, based on the information in this plan, and make their own plans.

The civil emergency response should follow the scale of a pandemic, for example:

- Maintenance of essential services such as emergency services, distribution, pharmaceutical supplies, utilities and communications.
- Management of mass casualties.
- Maintenance of public order.
- The role of the police and armed forces.

Following the international Obligation

A pandemic is, by definition, an international event. Bahrain must keep abreast of international developments and thinking. It also has certain international obligations (in particular in respect of the World Health Organization) to report disease incidents and outbreaks and the actions being taken. The Ministry of health will play its full part in contributing data, knowledge and expertise to help towards a coordinated and coherent international response.

f) Surveillance Activities in an Influenza Pandemic

Inter- pandemic

WHO Phases	Bah Phases	Description of phases	Surveillance objectives	Surveillance activities
0	Bah 0	No circulating animal influenza subtypes in Bahrain that have caused human disease	To detect unusual clusters or cases that may be due to a new influenza virus	<ul style="list-style-type: none"> Conduct routine influenza surveillance national reports from government and private hospitals and clinics. Undertake laboratory surveillance to monitor influenza virus isolates and detect local novel influenza strains.
1	Overseas 1	Animal infection overseas: the risk of human infection or disease is considered low	As above	<ul style="list-style-type: none"> Conduct routine influenza surveillance through the health facilities. Undertake laboratory surveillance to monitor influenza virus isolates and detect local novel influenza strains in travellers returning from high risk areas overseas.
	Bah 1	Animal infection in Bahrain: the risk of human infection or disease is considered low	As above	<p>As for Overseas 1, with addition of:</p> <ul style="list-style-type: none"> Undertake serosurveys, data collection and epidemiological analysis to identify human respiratory infections associated with exposure to infected animals eg poultry workers, vets and cullers through outbreak case reporting system. Monitor passive reporting of unusual clusters of influenza-like illness or acute respiratory disease.

WHO Phases	Bah Phases	Description of phases	Surveillance objectives	Surveillance activities
2	Overseas 2	Animal infection overseas – substantial human public health risk.	As above	As for Overseas 1
	Bah 2	Animal infection in Bahrain – substantial risk of human disease.	As above	As for Bah 1, with addition of: Ministry of Municipality and Agriculture Affairs to compile data on infected flocks and other species and to forward data to PHD.

Pandemic alert

WHO phases	Bah Phases	Description of phases	Surveillance objectives	Surveillance activities
3	Overseas 3	Human infection overseas with new subtype(s) but no human to human spread. • or at most rare instances of spread to a close contact.	<ul style="list-style-type: none"> • To detect the first case/s of pandemic influenza at Bahrain's border. • To collect and share clinical and epidemiological data on suspect / possible and confirmed cases. 	<ul style="list-style-type: none"> • Conduct routine influenza surveillance through national health facilities. • Undertake laboratory surveillance to monitor influenza virus isolates and detect local novel influenza strains in travelers returning from high risk areas overseas. • Implement data collection and epidemiological analysis on suspect, possible and confirmed cases in those with travel history in affected area through outbreak case reporting system. • Monitor passive reporting of unusual clusters of influenza-like illness or acute respiratory disease.


WHO phases	Bah Phases	Description of phases	Surveillance objectives	Surveillance activities
	Bah 3	Human infection in Bahrain with new subtype(s) but no human to human spread or at most, rare instances of spread to a contact.	<ul style="list-style-type: none"> To rapidly detect new clusters of cases in Bahrain. To collect and share clinical and epidemiological data on suspect / possible and confirmed cases. To provide data to inform policy decisions. 	<ul style="list-style-type: none"> Conduct routine influenza surveillance through health facilities. Undertake laboratory surveillance to monitor influenza virus isolates and detect local novel influenza strains in those from high risk areas overseas or in Bahrain. Undertake data collection and epidemiological analysis on suspect, possible and confirmed cases through Outbreak Case Reporting System Annex5. Monitor passive reporting of unusual clusters of influenza-like illness or acute respiratory disease.
4	Overseas 4	Human infection overseas – small cluster(s), limited human to human transmission, spread highly localised; virus is not well adapted to humans.	<ul style="list-style-type: none"> To detect the first case/s of pandemic influenza at Bahrain's border. To collect and share clinical and epidemiological data on suspect/possible and confirmed cases. 	As for Overseas 3, with addition of: Conduct border screening for ILI in travelers from affected regions. Annex9.

WHO phases	Bah Phases	Description of phases	Surveillance objectives	Surveillance activities
	Bah 4	<ul style="list-style-type: none"> Human infection in Bahrain – small cluster(s), limited human to human. Transmission, spread highly localised; virus is not well adapted to humans. 	<ul style="list-style-type: none"> To monitor the geographical spread of pandemic influenza within Bahrain. To monitor the distribution of pandemic by time, place and person. To guide the appropriate allocation of national resources. 	<ul style="list-style-type: none"> Conduct routine influenza surveillance through health facilities. Undertake laboratory surveillance to monitor influenza virus isolates and detect local novel influenza strains in those from high risk areas overseas or within Bahrain. Undertake data collection, laboratory testing and epidemiological analysis on suspect, possible and confirmed cases through Outbreak Case Reporting System Annex5. Monitor passive reporting of unusual clusters of influenza-like illness or acute respiratory disease. Conduct border screening for influenza like illness in travelers from affected regions. Undertake surveillance of ILI in health care workers exposed to suspect, probable or confirmed pandemic flu cases or their specimens.

WHO phases	Bah Phases	Description of phases	Surveillance objectives	Surveillance activities
5	Overseas 5	Human infection overseas – larger cluster(s) but human to human transmission still localised; virus is becoming better adapted to humans (substantial pandemic risk)	<ul style="list-style-type: none"> To detect the first case/s of pandemic influenza at Bahrain's border. To collect and share clinical and epidemiological data on suspect/ possible and confirmed cases. 	As for Overseas 4 with addition of: Conduct National surveillance if out of season.
	Bah 5	Human infection in Bahrain – larger cluster(s), substantial pandemic risk.	As for Bah 4	As for Bah 4, with addition of exit screening.

Pandemic

WHO phases	Bah Phases	Description of phases	Surveillance objectives	Surveillance activities
6	Overseas 6	Pandemic overseas – not in Bahrain: increased and sustained transmission in general population.	<ul style="list-style-type: none"> To detect the first case/s of pandemic influenza at Bahrain's border. To collect and share clinical and epidemiological data on suspect/possible and confirmed cases. 	<ul style="list-style-type: none"> Conduct routine influenza surveillance through health facilities. Initiate national surveillance if out of season. Undertake laboratory surveillance to monitor influenza virus isolates and detects local novel influenza strains in those from high risk areas overseas or in Bahrain.

WHO phases	Bah Phases	Description of phases	Surveillance objectives	Surveillance activities
				<ul style="list-style-type: none"> • Undertake data collection and epidemiological analysis on suspect, possible and confirmed cases through Outbreak Case Reporting System Annex 5. • Monitor passive reporting of unusual clusters of influenza-like illness or acute respiratory disease. • Conduct border screening for ILI in travelers from affected regions.
	Bah 6a	Pandemic in Bahrain – localised (one area of country).	<ul style="list-style-type: none"> • To monitor the distribution of pandemic by time, place and person • To monitor the impact of the pandemic on health and essential services staffing. • To measure the pandemic influenza vaccines. • To define susceptibility of virus to antiviral drugs. • To monitor adverse events following vaccination with pandemic influenza vaccine. 	<p>As for Overseas 6, with the addition of:</p> <ul style="list-style-type: none"> • Conduct entry and exit border screening Annex9. • Undertake surveillance of ILI in health care workers exposed to suspect, probable or confirmed pandemic flu cases or their specimens. • Undertake hospital-based surveillance. • Monitor absenteeism among essential services personnel. • Undertake studies to measure effectiveness of antivirals and/or vaccines and adverse events associated with antiviral and/or vaccine use.

Pubic Health Implementation Plan (contd.)

WHO phases	Bah Phases	Description of phases	Surveillance objectives	Surveillance activities
6	Bah 6b	Pandemic in Bahrain – widespread (multiple areas).	<ul style="list-style-type: none"> To guide the appropriate allocation of national resources. To monitor the distribution of pandemic by time, place and person. To assess if there is adequate staffing to maintain essential services. To assess the match between candidates pandemic vaccine and local influenza strain Variants. To ensure appropriate treatment and prophylaxis. 	<ul style="list-style-type: none"> Undertake surveillance through routine and hospital system. Undertake selected laboratory surveillance to isolate local pandemic virus to compare with vaccine strains and assess susceptibility to antiviral drugs. Monitor absenteeism among essential services personnel.
	Bah 6c	Pandemic in Bahrain – subsided	As above	As above
	Bah 6d	Pandemic in Bahrain – next wave	As above	As above

Pubic Health Implementation Plan (contd.)

g) Monitoring and evaluation of the Surveillance system

1. Preparedness check list:

Activity	Implemented	Not Implemented	Under Implementation
- Establishment of task force group at the Diseases Control Section	✓		
- Establishment of the legal and regulatory frameworks that specify the roles <ul style="list-style-type: none"> o participating partners and stakeholders, o ensure justification o Assessment of measures and facilitate quick and timely response 	✓		
- Preparation of MOH contingency plan	✓		
- Provision for human and technical resources.	✓		
- Development of guidelines for various activities.	✓		
- Formation of a MOH Avian Flue Coordination Committee to oversee the implementation, evaluation and revision of the plan.	✓		
- Ensuring of the establishment of mechanisms for the coordination, collection and dissemination related to the epidemic.	✓		

2. Availability of early warning system:

Bahrain characterized by frequent population mobility therefore it is important to establish an early warning system capable of detecting unusual clusters of cases that may be due to a new influenza virus. Through the following activities:

1. Surveillance of unexpected deaths caused by acute respiratory illness in health care facilities.
2. Clusters of severe acute respiratory illness in the community.

Enhanced surveillance activities in human with a special emphasis on:

- a) People involved in culling birds or animals infected with influenza
- b) People exposed to birds or animals infected with influenza e.g. farmers, veterinarians
- c) Health care workers including those caring for patients
- d) Laboratory workers
- e) Mortuary workers

3. Monitoring indicators

Pre - Pandemic indicators

1. Number of the actual monthly meetings of the national committee expressed as percent of the number expected.
2. Number of the actual monthly meetings of the MOH committee expressed as percent of the number expected.
3. Number of actual monthly meetings of Avian flu field committee expressed as percent of the number expected.
4. Number of actual monthly meetings of secondary care Avian Flu committee expressed as percent of the number expected.
5. Number of hospitals designated for Avian Influenza cases as percent of the total hospitals.
6. Percent of health workers trained to manage and care for Avian Influenza patients of the target.
7. Percent of antiviral drugs available in the districts of the quantity allocated to the districts.
8. Percent of antiviral drugs stockpiled in the central store of total procured.
9. Percent of routine Influenza vaccines (doses) stockpiled in the central store of total procured.
10. Percent of routine Influenza vaccines (doses) stockpiled in the districts of the quantity allocated to the districts.
11. Percent of persons dealing with infected birds applying precautionary measures of the total at risk.
12. Percent of persons dealing with birds vaccinated with seasonal flu vaccine expressed as percent of the number expected.
13. Percent of persons infected by bird flu in Bahrain of the total at risk.
14. Percent of contacts of persons infected by bird flu who have been fully Investigated and followed up of the total infected.

15. Percent of specimens tested in the national laboratory of the total collected.
16. Percent of patients treated of the total detected.
17. Percent of patients cured of the total treated.
18. Percent of TV time allocated for Avian Influenza Awareness of the total TV time.
19. Percent of press released in news papers and radio from total expected.
20. No. of lectures given expressed as percent of the number expected.

Pandemic indicators:

Pandemic indicators with cases transmitted from human to human abroad and no cases in Bahrain:

1. Number of emergency forms issued of the total expected.
2. Number of Ports of entry designated for international travel of the total ports.
3. Percent of emergency clinics designated in ports of entry of the total ports. .
4. Percent of travelers screened at designated ports of entry of the total travelers expected to be screened.

Pandemic indicators with limited number of cases /clusters in Bahrain:

1. Time taken to detect suspected cases from the date of onset of symptoms.
2. Time taken to confirm a suspected case from the date of first contact with the health services.
3. Time taken to reach designated hospitals from time of onset of symptoms.
4. Number of hospital wards applying adequate isolation measures of total hospital wards.
5. Percent of health workers using safety precautions of the total.
6. Time taken to report any suspected case of (ILI) from a medical outlet to the Disease Control Section.
7. Percent of suspected cases completely investigated of the total suspected.
8. Percent of contacts identified and reached out of total number of contacts.
9. Percent of the total quantity of antiviral drugs and vaccines used in the districts of the total allocated.
10. Number of patients treated of total detected.
11. Number of patients cured of the total treated
12. Number of patients died of the total confirmed cases.

Pandemic indicators with wider spread of Avian Influenza in Bahrain:

1. Number of districts with wide spread Avian Influenza of the total.
2. Number of districts which obide by curfew regulations' of the total.
3. Number of sectors other than health sectors involved in the control activities of the total.
4. Percent increase of designated districts for the epidemic of the total.
5. Percent of TV time allocated of the total TV time.
6. Number of patients treated of the total detected.
7. Number of patients cured of the total treated.
8. Number of Patients died of the total confirmed cases.

Public Health Implementation Plan (contd.)

h) Non-medical interventions at the national level (for persons living or traveling within an affected country

Measures	Phases b				Comments
	Pre-pandemic				
	0.1	0.2	0.3	1.0	
Public health information, communication					
- Information for public on risk and risk avoidance (tailored to target population)	Y	Y	Y	Y	
- Information for professionals	Y	Y	Y	Y	
- Advice on universal hygiene behaviour	Y	Y	Y	Y	
- Preparatory information on next phase	Y	Y	Y	Y	
Measures to reduce risk that cases transmit infection					
Confinement					
- confine cases (mild and severe) as to local situation; provide medical and social care.	Y	Y	Y	Y	- Need to plan for large numbers of severe cases.
- Face masks					
• symptomatic persons	Y	Y	Y	Y	- Logistics need to be considered.
• exposed person: undertake risk assessment considering: evidence of human to human-transmission; closeness of contact and frequency of exposure	C	C	C	C	- Consider recommending masks based on risk assessment.
• persons seeking care (respiratory illness) in risk area (waiting room)	Y	Y	Y	Y	- Need more data, especially on use by well people.
Measures to reduce risk that contacts transmit infection					
- Tracing and follow-up of contacts	Y	Y	Y	Y	- Not feasible once pandemic starts.
- Self-health monitoring and report if ill	Y	Y	Y	Y	
- Voluntary quarantine (home confinement)of healthy contacts; provide medical and social care	N	N	N	N	- Home confinement should also apply to persons undergoing antiviral prophylaxis, as efficacy not known.
- Advise contacts to reduce social interaction	N	N	NR	N	- Not relevant for contacts in quarantine; see also measures to increase social distance.
- Advise contacts to defer travel to unaffected areas.	Y	Y	NR	Y	- Precautionary principle when unclear whether human-to-human transmission is occurring; see also travel measures.
- Provide contacts with antiviral prophylaxis	N	N	N	N	- Principle of early aggressive measures to avert pandemic.

Pubic Health Implementation Plan (contd.)

Measures to increase social distance					
- Voluntary home confinement of symptomatic persons.	Y	Y	Y	Y	- Measures needed to reduce risk of transmission to other household members.
- Closure of schools (including pre-school, higher education) in conjunction with other measures (limiting after-school activities) to reduce mixing of children	N	N	N	N	- Depends on epidemiological context
- Population-wide measures to reduce mixing of adults (through non-essential workplaces, discourage mass gatherings)	N	N	N	N	- extent to which these settings contribute to transmission.
- Masks in public places	N	N	N	N	- Consider in certain circumstances – extent to which unlinked community transmission and transmission in workplaces occurs.
					- Not known to be effective; permitted but not encouraged.
Measures to decrease interval between symptom onset and patient isolation					
- Public campaign to encourage prompt self-diagnosis	Y	Y	Y	Y	
- Urge entire population (affected area) to check for fever at least once daily	N	N	N	N	
- Set up fever telephone hotlines with ambulance response	N	N	C	N	
- Set up fever clinics with appropriate infection control	N	N	C	N	
- Introduce thermal scanning in public places	N	N	N	N	- Not effective based on experience; also requires individual and public health action for identified febrile persons.
Disinfection measures					
- Hand-washing	Y	Y	Y	Y	
- Household disinfection of potentially contaminated surfaces	Y	Y	Y	Y	
- Widespread environmental disinfection	N	N	N	N	
- Air disinfection	N	N	N	N	

Public Health Implementation Plan (contd.)

Measures for persons entering or exiting an infected area within the country					
- Advise to avoid contact with high-risk environments (infected poultry farms, live poultry markets)	Y	Y	Y	Y	
- Recommended deference of non-essential travel to affected areas	N	N	Y	Y	- If significant areas of country remain unaffected.
- Restrict travel to and from affected areas	N	N	N	N	- Enforcement of travel restrictions considered impractical in most countries but likely to occur voluntarily when risk appreciated by the public.
- Cordon sanitaire	N	N	N	N	- Enforcement considered impractical.
- Disinfection of clothing, shoes, or other objects of persons exiting affected area	N	N	N	N	- Not recommended for public health purposes, but may be required by veterinary authorities to prevent spread of infection in animals.

Public Health Implementation Plan (contd.)

Measures	Phases b				Comments
	Pre-pandemic				
	0.1	0.2	0.3	1.0	
Public health information, communication - Information for public on risks and risk avoidance (tailored to target population) - Information for professionals - Advice on universal hygiene behaviour - Preparatory information on next phase	Y	Y	Y	Y	
Measures at borders for persons entering or exiting a country Information to travellers - Outbreak notice	Y	Y	Y	Y	- Message must be tailored to phase. While travel would remain matter of personal choice, transparency must be assured in order to allow for informed decision-making. Consequences for the traveller may include personal risk to health and economic harm
• recommend that travellers to areas experiencing outbreaks of highly pathogenic avian influenza avoid contact with poultry farms and live animal markets	Y	Y	N	N	
• recommend deference of non-essential international travel to affected areas	N	N	Y	Y	
Measures at borders for international travellers coming from or going to affected areas - Health alert notices to travellers to and from affected areas	N	N	Y	Y	- WHO negotiates with IATAc to ensure that airlines distribute health alert notices; WHO facilitates shared notice formats among countries
- Medical surveillance • daily self-checking for fever Travellers from affected area Travellers to affected area	N	N	Y	Y	
	N	N	N	Y	
• self-reporting if symptoms appear in travellers from affected areas	Y	Y	Y	Y	- Contacts of confirmed cases should be encouraged to monitor health.
• advice on how to behave if ill after travel in affected areas (seek health care, give travel history, receive influenza laboratory test), if pandemic virus detected, patient should be isolated and public health officials, WHO, notified.	Y	Y	Y	Y	- Quarantine may be indicated. Persons on affected conveyance should be traced and similarly advised.

i) Non-Medical Interventions at the International Level

Entry screening for travellers coming from affected areas					- Due to lack of proven health benefit, practice should be permitted (for political reasons, to promote public confidence) but not encouraged. Travellers should receive health alert notices instead.
Screening for symptoms (visual detection of symptom					- Entry screening may be considered where host country suspects exit screening (see below) at traveller's point of embarkation is suboptimal.
- screening for at-risk travellers (health declaration, questionnaire)	N	N	N	N	
- thermal screening	N	N	N	N	
- medical examination	N	N	N	N	
- Entry screening options for geographically isolated infection-free areas (islands)	N	N	Y	Y	- Feasible, may prevent entrance of pandemic virus. May also be relevant where country's internal surveillance capacity is limited.
Exit screening for all travellers from areas with human infection	N	N	Y	Y	- More feasible than entry screening for detecting early cases.
- screening for symptoms (visual detection of symptoms)	N	N	N	N	- Not feasible due to passenger volume.
- screening for at-risk travellers (health declaration, questionnaire)	N	N	Y	Y	
- thermal scanning or ear-temperature measurement	N	N	Y	Y	- Thermal scanning less sensitive and specific but may be more practical than ear-temperature scanning.
- stop list of isolated or quarantined persons	N	N	N	N	- May be feasible in certain countries, but generally not encouraged.
- recommend that ill persons postpone travel	Y	Y	Y	Y	
- medical examination for travellers at risk, with fever	N	N	N	N	- Not feasible to implement at borders.

Measures for countries with porous borders (including informal or illegal crossing points) adjoining affected areas _					
Raise awareness among health care providers and general public to facilitate “informal” surveillance and response measures, such as social distancing, quarantine or isolation	N	N	Y	Y	WHO to post relevant guidelines on web for use by countries in developing posters, mass media messages, and similar measures. Possible benefits include rumour control.
Measures for travellers on board international conveyances from affected areas					
- Recommend self-reporting if influenza-like symptoms appear	N	N	Y	Y	
- Separate sick travellers (if possible) on board	N	N	Y	Y	- On flights from affected areas, masks should be offered to all passengers upon boarding.
- Advise health authority at countries of traveller’s embarkation, destination and transit that a person on board is ill (airline is responsible for destination only)	Y	Y	Y	Y	- Established requirement for destination, but not uniformly observed in practice.
- Share epidemiological information for contact tracing with national public health authorities	N	N	Y	Y	- Countries to share this information directly with others, as appropriate

Y = yes, should be done at this phase; N = no, not necessary at this phase; C = should be considered; NR = not relevant.

b Phases

0.1 = A novel virus subtype is isolated from a single human case. No evidence of further spread or outbreak activity.

0.2 = Two or more human infections with the novel virus subtype are confirmed. No evidence of human-to-human transmission.

0.3 = Human-to-human transmission is confirmed.

1.0 = Onset of pandemic. The new virus subtype causes several outbreaks in at least one country, shows international spread, and causes serious morbidity and mortality in at least one segment of the population.

c IATA = International Air Transport Association.

j) Guide for the surveillance team

The surveillance team must investigate all notified suspected or probable cases comprehensively. The team must work closely with the central team of disease control and prevention in the Ministry of Health.

The investigation team must:

1. Investigators must wear protective clothing to include a N95 mask, gown, shoe covers, and disposable latex or vinyl gloves while investigating cases or contacts.
2. Recommend immediate isolation of cases that meet the probable or suspected case definitions.
3. Complete case investigation form and insure that all relevant information is included. If the patient is unable to answer questions because of illness, the investigator must interview the patient's family, close friends and work associates to verify contact history.
4. Identify the most likely source of initial exposure of the case.
5. Verify the movements of the case from the date of onset of symptoms.
6. Identify contacts for tracing, follow-up and surveillance (A list of potential contacts can then be drawn-up and traced).
 - * Definition of Contact: A contact is a person who has had any association with a suspected case, infected birds or shared the same environment contaminated with Avian Influenza virus of a confirmed human case and therefore an opportunity to contract the infection.
 - * The risk of contracting Avian Influenza by a contact increases with closer contact, longer exposure to infected birds or their raw products.
 - * A Close contact means a person who have had direct contact with infected birds either by working in an infected farm or working in the field of bird meat production in an infected geographical area.
7. Once all contacts are listed, they must be followed up according to the following categories:
 - a. Household contacts.
 - b. Immediate family members.
 - c. Persons who work full time in the same place.
 - d. People with history of travel to an affected area in the last 7 days.
8. Follow up of all contacts must be continued for at least 7 days.
9. Monitor clinical course and outcome of cases.
10. Monitor the epidemiology and progress of the outbreak if it occurs for analysis and communications purposes.
11. Initiate active surveillance in all healthcare facilities across the country.
12. Ensure daily zero reporting from all governmental and private health facilities.
13. Provide all governmental and private health care facilities with lists of affected countries on a daily basis or whenever the information is available.

k) Guidelines for Travel

1) WHO recommendations to travellers coming from & going to countries experiencing outbreaks of HPAI:

These recommendations are in line with phase 3 in the WHO 6 phase scale of pandemic alert: human infections with a novel influenza virus subtype are occurring, but the virus does not spread efficiently or in a sustainable way among humans. These recommendations may change according to the change in the epidemiological situation and related risk assessments.

Advice to Countries:

- WHO does not recommend any restrictions on travel to any areas affected by H5N1 avian influenza.
- WHO does not recommend travel restrictions to areas experiencing outbreaks of highly pathogenic H5N1 avian influenza in birds, including countries which have reported associated cases of human infection.
- WHO does not recommend screening of travellers coming from H5N1 affected areas.
- WHO does not at present recommend the routine screening of travellers coming from affected areas. Local authorities may, however, usefully provide information to travellers on risks, risk avoidance, symptoms, and when and where to report should these symptoms develop.
- The recommendation for screening of travellers may change if human to human spread occurs.

Advice to Travellers:

- WHO advises travellers to avoid contact with high risk environments in affected countries. Travellers to areas affected by avian influenza in birds are not considered to be at elevated risk of infection unless direct and unprotected exposure to infected birds (including feathers, faeces and under cooked meat and egg products) occurs.
- WHO continues to recommend that travellers to affected areas should avoid contact with live animal markets and poultry farms and any free-ranging or caged poultry. Large amounts of the virus are known to be excreted in the droppings from infected birds. Populations in affected countries are advised to avoid contact with dead migratory birds or wild birds showing signs of disease.
- Direct contact with infected poultry, or surfaces and objects contaminated by their droppings, is considered the main route of human infection. Exposure risk is considered highest during slaughter, de feathering, butchering, and preparation of poultry for cooking. There is no evidence that properly cooked poultry or poultry products can be a source of infection.
- Travellers should contact their local health providers or national health authorities for supplementary information.

2) Guidelines for Civil Aviation and Airlines:

It is essential to have the following in place once the pre-pandemic phase of the plan is implemented:

- All Airlines are briefed on the Avian Influenza affected areas.
- All Airlines and reception staff are briefed on the policy for managing Avian Influenza suspects in airplanes and at the airports.
- All health staff have security clearance.
- Information on incoming flights is reported on timely basis to the Medical Clinic. Adequate police/other staff are available to help the Medical team. They must ensure that all passengers hand in their contact form before leaving the area.
- If feasible designate one gate solely for flights incoming from affected areas.
- The arrival gate is suitable for screening.
- Airlines staff wear masks when checking an 'in-flight' suspected case.
- Identify a person or section with 24-hour responsibility for the Avian Influenza episode.

3) Procedures for meeting airplanes coming from affected areas and arriving at Bahrain airport:

- If there is a suspect Avian Influenza passenger: Chief steward ensures that passengers on the same row and the rows in front and behind and the staff are given masks to wear.
- The pilot communicates the health status of the passenger and crew to the Airport Avian Influenza officer.
- On the basis of the report from the Pilot the Avian Influenza officer with the control tower decide on the parking space for the airplane:
 - No sick reports. Plane parks at designated arrival gate.
 - Sick report compatible with Avian Influenza suspects. Plane parks in a bus area and suspect patient and all passenger are taken for medical screening in an evaluation room.
 - If the suspect person is a member of the flight crew, all passengers must be considered direct contacts and should undergo medical screening.
- Medical process for suspected Avian Influenza passenger or staff member
 - Ensure that suspect person wears N95 mask and taken from the plane by designated ambulance directly to the airport clinic.
 - Staff transporting people from the plane and the screening staff must wear N95 masks and gloves.
 - In the evaluation clinic:
 - Ask the patient questions relevant to diagnosis
 - Take the temperature with a thermometer
 - Examine the patient clinically and decide whether he/she is:
 - ◆ Not ill; then normal management and home quarantine.
 - ◆ Suspect ILI - send to designated hospital for admission and treatment.
 - Other passengers who are considered to be at special risk because of exposure to a suspect case on the flight need to be informed about self-quarantine at home for 7 days and followed up by the surveillance team (Guides for the surveillance team).

- _ If the suspect case is a flight attendant, all passengers must be considered contacts and managed accordingly.
- Process for normal flight with no suspect case: Must report to the clinic for a check up.
- After transportation of the patient, the clinic shall be decontaminated. Hypochlorite is recommended for decontamination.
- Health care facility at the airport must call Communicable Diseases Unit at Diseases Control Section in the Public Health Directorate, to report zero cases on a daily basis.

4) Transit Passengers coming from affected area:

Direct flight:

- All passengers must remain on the airplane and not allowed to enter airport transit area
- If there is a suspect Avian Influenza case, plane parks in a bus area and suspect patient must be taken for medical screening at the airport clinic.
- If discarded: return to airplane and continue the trip destination.
- If Suspected: Referred to designated isolation hospital and ensure that passengers on the same row and the rows in front and behind and the staff are given masks to wear.
- Pass information to the pilot of the plane.

Indirect flight:

- Plane parks in a bus area and all passengers shall go to the designated waiting area until departure. They are not allowed to enter airport .
- If there is a suspect Avian Influenza case, plane parks in bus area and suspect patient shall be taken to airport clinic for evaluation:
 - Discarded: return to the designated waiting area until departure and continue trip to the final destination.
 - Suspected: Referred to designated isolation hospital.
 - Ensure that passengers on the same row and the rows in front and behind are given masks to wear.

Annex 1 Infection Control Precautions for HPAI for Clinical Staff

Characteristics of influenza infection

The management of infectious cases of pandemic influenza and their contacts is determined by the mode of transmission, the incubation period and the infectious period.

Infectious period

The infectious period is usually from the onset of symptoms to:

- seven days since resolution of fever (in those > 12 years); and
- 21 days since onset of illness (in those <12 years). A small proportion of patients may be infectious from just before symptoms appear.

Standard precautions

Treating all patients in the health care facility with the same basic level of “standard” precautions involves work practices that are essential to provide a high level of protection to patients, health care workers and visitors.

These include the following:

- Hand washing and antiseptics (hand hygiene).
- Use of personal protective equipment when handling blood, body substances, excretions and secretions.
- Appropriate handling of patient care equipment and soiled linen.
- Prevention of needlestick/sharp injuries.
- Environmental cleaning and spills-management.
- Appropriate handling of waste.

Infection control in health care facility

Additional (transmission-based) precautions are taken while still ensuring standard precautions are maintained. Additional precautions include:

- Droplet precautions.
- Contact precautions (including the use of high efficiency masks and negative pressure rooms if possible).
- A combination of these precautions will give the appropriate level of precaution for H5N1. The precautions should be implemented while the patient is infectious:
- Adults > 12 years of age – precautions to be implemented at time of admission and continued until 7 days have lapsed since onset of symptoms.
- Children <12 years of age – precautions to be implemented at time of admission and continued until 21 days have lapsed since onset of symptoms.

“Shedding of virus can be at high titres for up to 21 days in young children”

The following precautions need to be taken:

1. Items entering the room or area where patients with H5N1 are present must be cleaned or placed into an appropriate clean container before removal from the environment.
2. All persons (staff/visitors) should ensure that they clean their hands and remove the outside layer of PPE before exiting the room or area.
3. Patients or groups of patients with H5N1 should be placed in a single room – if possible one with negative pressure.
4. Only essential staff/visitors who have been educated about H5N1 should enter the room.

Annex 1 Infection Control Precautions for HPAI for Clinical Staff (contd.)

5. All staff/visitors who enter the room should sign a log book.
6. All health care workers (and visitors) must wear personal protective equipment when entering the room.
7. The patient must wear a surgical face mask when in contact with staff/visitors.
8. The infection control equipment trolley should remain outside the door. Annex 2
9. Patients should have clinical equipment (e.g. sphygmomanometer, thermometer) dedicated to their exclusive use.
10. Sterile items should be disposable where possible. Reusable items should be placed in a plastic bag and then into another plastic bag inside the equipment collection bin on the trolley. Request the sterile service department to collect.
11. Alcohol-based handrub should be located in and outside the room.
12. The patient's room must be cleaned each day – including all horizontal surfaces and blinds. Curtains should be thoroughly cleaned (by laundering in hot water) at least weekly.
13. Cleaning equipment must be cleaned after each use. Mop heads should be sent to the laundry for proper laundering in hot water.
14. Pathology specimens must be taken directly to the laboratory. Request form must indicate “highly pathogenic influenza A”.
15. Used linen should be placed in a linen bag inside the room and then into another bag outside the room. Take immediately to laundry collection area – treat as per normal soiled/contaminated linen.
16. All waste should be discarded into clinical waste bag inside the room. When waste is to be collected for disposal, place in another bag outside the room and then treat as “normal” clinical/contaminated/infectious waste.
17. A calling bell should be set up in the patient's room.
18. Implement and/or reinforce standard precautions.
19. Limit the movement and transport of the patient from the room for essential purposes only. If transport is necessary, minimize dispersal of droplet nuclei by masking the patient.

Single rooms reduce the risk of transmission of infection from the source patient to others by reducing direct or indirect contact transmission. Where possible, single rooms should have the following facilities:

- Hand washing facilities.
- Toilet and bathroom facilities.
- Anterooms

Single rooms used for isolation purposes may include an anteroom to support the use of personal protective equipment.

Transportation of patients

Limit the movement and transport of patients from the isolation room/area for essential purposes only. If transportation is required out of the isolation room/area within the hospital, the patient should wear a mask and a gown where possible. All staffs involved in the transportation should wear personal protective equipment. If transportation outside the health care facility is required, the patient should wear a surgical mask and gown and where there is contact with surfaces, these surfaces should be cleaned afterwards. For example, if a patient has been transported in an ambulance, the ambulance may be cleaned inside with a disinfectant such as 70% alcohol.

Annex 1 Infection Control Precautions for HPAI for Clinical Staff (contd.)

Personal protective equipment used for H5N1

Personal protective equipment reduces the risk of infection if used correctly. It includes:

- Gloves (nonsterile).
- Long-sleeved cuffed gown.
- Plastic apron if splashing of blood, body fluids, excretions and secretions is anticipated.
- Protective eyewear/goggles/visors/face shields.
- Cap (may be used in high risk situations where there may be increased aerosols).
- Mask (high-efficiency mask).

P2 (N95) masks are expected to minimise air-borne and droplet transmission of respiratory secretions from an infectious case to the attending person. If used, they should be properly fit tested.

Surgical masks are expected to minimise droplet transmission of respiratory secretions from an infectious case to other close contacts. Unless it needs to be removed for examination purposes, the infectious case should wear a surgical mask to minimise exhalation of respiratory secretions when other people are within 1 metre or are in the same room.

Who should use personal protective equipment?

Anyone who enters the isolation room/area, including:

- All health care workers who provide direct patient care (e.g. doctors, nurses, radiographers, physiotherapists).
- All support staff, including medical aides and cleaning staff.
- Family members or visitors.
- All laboratory workers handling specimens from a patient with H5N1.
- All sterilizing service workers handling equipment that requires decontamination and has come from a patient with H5N1.

Waste disposal

All waste generated in the isolation room/area should be disposed of in suitable containers or bags. All waste from a H5N1 room should be treated as clinical (infectious) waste.

Staff responsible for routinely removing waste from isolation wards/areas should wear full personal protective equipment when removing waste.

One waste disposal bag is usually adequate, providing waste can be placed in the bag without contaminating the outside of the bag. If that is not possible, two bags are needed (double bagging).

Liquid waste such as urine or faeces can be safely flushed into the sewer system if there is an adequate sewage system in place.

Annex 1 Infection Control Precautions for HPAI for Clinical Staff (contd.)

Waste disposal bags should include appropriate biohazard labelling, and be treated and disposed of as per the policy of the hospital and in accordance with national regulations pertaining to hospital waste.

Cleaning and disinfection²

The survival time for the influenza virus is:

- 24-48 hours on hard, non-porous surfaces.
- 8-12 hours on cloth, paper and tissue.
- 5 minutes on hands.

The virus is inactivated by 70% alcohol and by chlorine therefore cleaning of environmental surfaces with a neutral detergent followed by a disinfectant solution is recommended.

Disinfectants	Recommended use	Precautions
Sodium hypochlorite 1% in-use dilution, 5% solution to be diluted 1:5 in clean water	Disinfection of material contaminated with blood and body fluids	<ul style="list-style-type: none"> • Should be used in well-ventilated areas. • Protective clothing required while handling and using undiluted. • Do not mix with strong acids to avoid release of chlorine gas • Corrosive to metals.
Bleaching powder 7g/litre with 70% available chlorine	Toilets / bathrooms -may be used in place of liquid bleach if this is unavailable	Same as above
Alcohol(70%) spirit. Isopropyl, ethyl alcohol, methylated spirit.	Smooth metal surfaces, tabletops and other surfaces on which bleach cannot be used.	<ul style="list-style-type: none"> • Flammable, toxic, to be used in well-ventilated area, avoid inhalation. • Keep away from heat sources, electrical equipment, flames, and hot surfaces. • Allow it to dry completely, particularly when using diathermy as this can cause diathermy burns.

Specimen collection and transportation

Following standard precautions, all specimens should be regarded as potentially infectious and staff should adhere vigorously to protective measures in order to minimize exposure.

Specimens for transport must be placed in leak-proof specimen bags, which have a separate sealable pocket for the specimen (i.e. a plastic biohazard specimen bag.) Personnel who transport specimens should be trained in safe handling practices and decontamination procedures in case of a spill.

The accompanying request form should be clearly marked as “suspected or probable H5N1” and the laboratory notified by telephone that the specimen is “on its way.” Specimens should be hand delivered where possible. Pneumatic tube systems should not be used to transport specimens.

Annex 1 Infection Control Precautions for HPAI for Clinical Staff (contd.)

Care of H5N1 patients in isolation

Patients with H5N1 should be cared for in single rooms to prevent direct or indirect transmission Annex 3.

Strict adherence to the infection control guidelines is essential to prevent transmission of infection between patients and from patients to health care workers and others.

Care of patients in isolation units becomes a challenge when there are inadequate resources, or when the source patient has poor hygienic habits, deliberately contaminates the environment, or cannot be expected to assist in maintaining infection control precautions to limit transmission of microorganisms (children, patients with an altered mental state, or elderly persons).

In caring for H5N1 patients in isolation the following guidelines are to be followed:

Preparation of the isolation room

1. Ensure additional precautions through appropriate signage on the door .
2. Place a recording sheet at the entrance of the isolation room. All health care workers or visitors entering the isolation area should be encouraged to print their details on the recording sheet so that if follow up/contact tracing is required, details are available.
3. Remove all non-essential furniture. The remaining furniture should be easy to clean and should not conceal or retain dirt or moisture, either within or around it.
4. Collect linen as needed.
5. Stock the hand basin with suitable supplies for hand washing.
6. Place appropriate waste bags in the room on a foot-operated bin.
7. Place a puncture-proof container for sharps in the room.
8. Keep the patient's personal belongings to a minimum. Keep water pitcher and cup, tissue wipes, and all items necessary for attending to personal hygiene within the patient's reach.
9. The patient should be allocated his/her own non-critical items of patient care equipment, e.g. stethoscope, thermometer and sphygmomanometers. Any item of patient care equipment that is required for other patients should be thoroughly cleaned and disinfected prior to use.
10. Set up a trolley outside the door to hold personal protective equipment. A checklist may be useful to ensure all equipment is available Annex 2.
11. Place an appropriate container with a lid outside the door for equipment that requires disinfection and sterilization. Once equipment has been appropriately cleaned it can be sent to the sterilizing service department.
12. Keep adequate equipment required for cleaning and disinfection inside the patients' room. Scrupulous daily cleaning of the isolation unit is important in the prevention of cross infection.
13. If possible the air conditioning should ensure the direction of the air-flow is from the outside adjacent space (e.g. the corridor) into the room. This is known as "negative pressure". See glossary.
14. Cutlery and crockery should be cleaned in hot soapy water.

Entering the room

- 1) Collect all equipment needed.
- 2) Wear personal protective equipment
- 3) Enter the room and shut the door.

Annex 1 Infection Control Precautions for HPAI for Clinical Staff (contd.)

Leaving the room

Remove personal protective equipment in the correct order:

- Remove gown (place in rubbish bin)
- Remove gloves (peel from hand and discard into rubbish bin)
- Use alcohol-based handrub or wash hands
- Remove cap and face shield (place cap in bin and if reusable place face shield in container for decontamination)
- Remove mask - by grasping elastic behind ears – do not touch front of mask
- Use alcohol-based handrub or wash hands
- Leave the room
- Once outside room use alcohol handrub again or wash hands
- Wash hands using plain soap, antimicrobial agent or waterless antiseptic agent such as an alcohol-based hand gel.

Staff health management

Health care workers who are involved in caring for a patient with H5N1 should receive training on the mode of transmission, the appropriate infection control precautions and the exposure protocol.

Staff not involved in direct patient care should be given general advice about avian influenza – see Annex 4.

Exposed health care workers

Antiviral prophylaxis and flu vaccination

All health care workers, or field investigators who are expecting to have contact with H5N1 or have had contact with an H5N1 patient or an environment that is likely to be contaminated are recommended to:

- 1) Be vaccinated with the current WHO recommended influenza vaccine two weeks prior to the event. This will not protect against H5N1, but it will help to avoid simultaneous infection by human influenza and avian influenza and thus will minimize the possibility of re-assortment of the virus's genes.
- 2) Take one Oseltamivir phosphate 75mg tablet each day for at least 7 days beginning as soon as possible after exposure. Antiviral therapy should begin immediately or at least within 2 days of exposure and may continue for up to 6 weeks.

Self-management

- 1) Check temperatures twice daily and monitor self for other respiratory symptoms especially cough. Where available, daily throat swab sampling is recommended during the high-risk field visits.
- 2) Where at all possible, keep a personal diary of contacts. The diary should not be taken into isolation areas or into farms.
- 3) In the event of a fever, immediately limit interactions and exclude yourself from public areas. Notify the infection control team or occupational health team.

Annex 1 Infection Control Precautions for HPAI for Clinical Staff (contd.)

Discharging the patient

- 1) The patient and family should be educated about the appropriate precautions to take when in contact with chickens, wet markets etc (see Annex 4 advice for family and friends)
- 2) Carry out appropriate cleaning and disinfection of the room.

Care of the deceased

The care of deceased pandemic influenza patients raises infection control issues, along with significant social and religious considerations. detailed guidelines

In the interim, deceased pandemic influenza patients should be sealed for transportation in an impermeable body bag. If the body bag is thought to be permeable then double bagging should occur, and the zip or other openings sealed with airtight tape. Alternatively, the bag may be placed within a large thick plastic outer bag that can be sealed.

All post mortem procedures require adherence to standard precautions. All procedures performed on respiratory specimens from potential cases of influenza due to a new pandemic strain should be undertaken in a PC3 facility using PC3 work practices, until pandemic influenza cases are widespread in the community.

- 1) Health care workers must follow standard precautions when caring for the deceased patient.
- 2) Full personal protective equipment must be worn if the patient died during the infectious period (i.e. 7 days after the onset of symptoms in adults and 21 days after the onset of symptoms in children).
- 3) The body should be fully sealed in an impermeable body bag prior to transfer to the mortuary.
- 4) No leaking of body fluids should occur and the outside bag should be clean.
- 5) Transfer to the mortuary should occur as soon as possible after death.
- 6) If the family of the patient wishes to view the body, it may be allowed to do. If the patient died in the infectious period the family should wear gloves and a gown.
- 7) Cultural sensitivity should be recognized and considered in situations where a patient with H5N1 dies.

Post mortem⁵

A post mortem examination of someone who had or probably had H5N1 should be performed with caution if the patient has died during the infectious period. If the patient is still shedding virus when he or she dies the lungs may still contain the virus. Therefore when any procedure is performed on the cadaver's lung, full PPE should be worn including high-efficiency mask, gloves, gown and goggles.

Minimizing the risk from an infected cadaver

- a) Prevent the production of aerosols – especially when excising the lung, by:
 - Avoiding the use of power saws.
 - Conducting procedures underwater if there is a chance of aerosolization.
 - Avoiding splashing when removing lung tissue.

Annex 1 Infection Control Precautions for HPAI for Clinical Staff (contd.)

b) As a general guide follow standard precautions and:

- Use the minimal amount of equipment in the autopsy.
- Avoid using scalpels and scissors with pointed ends.
- Never pass instruments and equipment by hand – always use a tray.
- If possible use disposable instruments and equipment.
- Keep the number of staff present to a minimum.

c) Mortuary care/ funeral director's premises

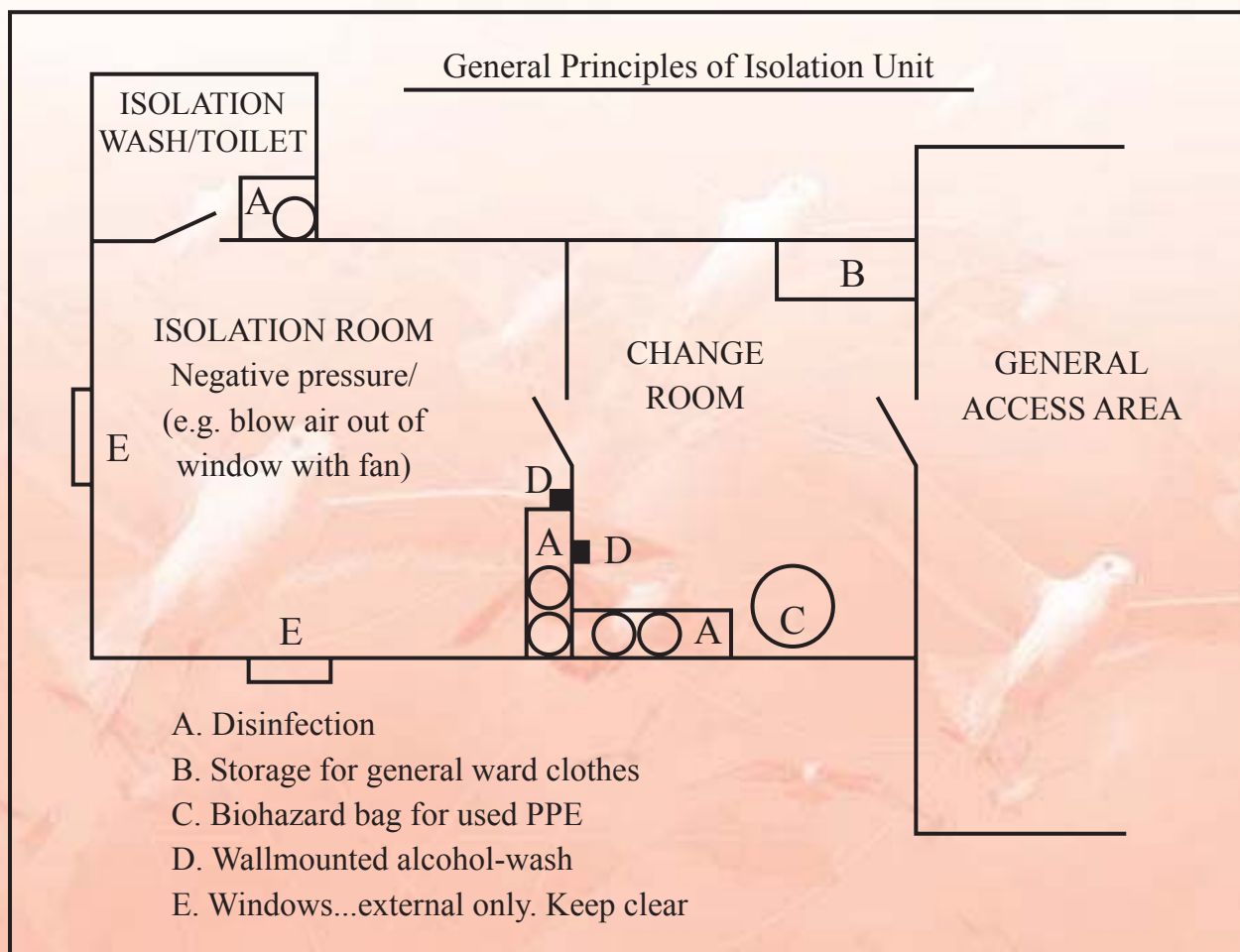
- Staff of the mortuary or funeral home should be informed that the deceased had H5N1. It should be explained that standard precautions are all that is required in the event of exposure to the body.
- Embalming may be conducted as routine.
- Hygienic preparation of the deceased (e.g. cleaning, tidying of hair, trimming of nails, and shaving) may also be conducted.

Annex 2 Suggested Checklist for H5N1 Trolley/Table

Items should be kept on this trolley at all times so that personal protective equipment is always available for staff.

Equipment	Stock present
Face shield/eye protection goggles	
Single use gloves for clinical use (sizes: small, medium, large)	
Gloves (reusable for environmental cleaning)	
Theatre caps (optional for high-risk situations but should be available)	
High efficiency masks	
Surgical masks	
Single-use long sleeved gowns	
Single use plastic aprons	
Alcohol-based handrub or alternative method for washing hands in clean water	
Soap	
Disinfectant	
Clean towel	
Appropriate disinfectant for environmental cleaning	
Pathology equipment Request form Biohazard Pathology Specimen bags FBC tube EDTA tube NPA tubing set or Sterile dacron or rayon swab sticks with plastic shafts and Tube containing Viral Transport Media with a lid Sterile Stool specimen container Sterile Urine specimen container	
Large plastic bags	
Appropriate waste bags	
Linen bags	
Collection container for used equipment	

Typical isolation facility appropriate for patients with highly pathogenic avian influenza



Annex 4. Infection Control Advice for Non Clinical Staff

Advice about contact with chickens, ducks or other animals

- Avoid contact with chicken farms, duck farms or any farm where animals have been ill, slaughtered or are thought to harbour Avian influenza.
 - If you inadvertently come into contact with an environment that has had sick/dead chickens
 - wash hands thoroughly and monitor your temperature for 7days. If you develop a temperature
 - consult your doctor regarding whether or not you should receive antiviral medication.
 - If you have had contact with any dead chickens that have died from avian influenza or if you have had contact with the faeces of these chickens – monitor your health for 7 days and consult your doctor for advice.
 - If you have chickens that have died in your back yard – you should know how to decontaminate your yard.
- Wear personal protective equipment – at least cover your face and wear gloves or plastic bags over your hands.
 - Bury the dead poultry to at least 2.5 meters. This must be away from water supplies.
 - Clean area of all chicken droppings – scrape or use rake and bury the chicken droppings.
 - Clean the chicken shed or area where a dropping has been with soap and water.

Advice about visiting friends or relative in health care facilities

- Avoid contact with patients known to have H5N1 during the infectious period of their illness. This is 7 days for adults and 21 days for children (< 12years old).
- If you must visit a patient who is suspected as having H5N1 or confirmed as having H5N1 – follow the infection control precautions in place in the hospital for the period the patient is infectious.
- You will need to wear personal protective equipment if you have direct contact with the patient or the patients environment.
- You should receive advice on the proper way to put on the personal protective equipment, especially on how to fit the mask to your face.
- Personal protective equipment you will need to wear includes mask, gown, gloves and goggles.
- When you leave the room you must remove these items and wash your hands very well.
- After you have been in contact with the patient with H5N1 you should monitor your health for 7 days. If you develop a temperature and sore throat you should consult your doctor for advice regarding antiviral treatment.
- If your illness becomes severe you should seek medical advice immediately and inform them you have been in contact with H5N1.

Advice about respiratory illness

- Anyone with respiratory type illnesses should be careful with secretions from the nose and mouth.
- Cover the nose and mouth when coughing or sneezing – use a tissue and dispose of this once used in the waste
- Always wash hands after having any contact with respiratory secretions.
- Be careful with respiratory secretions (eg. coughing and sneezing) when around other people, especially small children. It may be best to avoid contact with individuals at risk (small children or those people with illnesses) until respiratory symptoms have resolved.
- Avoid contact with secretions of people who have respiratory illnesses.
- Ask people to use a tissue and cover their nose and mouth when coughing or sneezing.
- Seek medical advice if the illness is severe.

Annex 5. HPAI Case Notification Form

Case No.

Reporting Details

Reporting date (dd/mm/yy) ____ / ____ / ____
 Reporting institution _____
 Contact Tel No: _____

Demographic details

Sex Male Female Unknown
 Date of Birth (dd/mm/yy) ____ / ____ / ____ OR Age (years) ____
 Usual country residence _____
 Nationality _____
 Health Care Worker Yes No Unknown
 If NO then occupation: _____
 Contact Name: _____ Tel No: _____
 Address: House No: _____ Road No: _____ Block No: _____ Area: _____

Sign and symptoms

Date of onset of initial symptoms (dd/mm/yy) ____ / ____ / ____
 Body temperature higher than 38°C Yes No Unknown
 Cough Yes No Unknown
 Difficulty in breathing Yes No Unknown
 Clinical findings of Respiratory Distress Syndrome Yes No Unknown
 Chest X-ray performed Yes No Unknown
 If yes, evidence of pneumonia or Respiratory Distress Syndrome Yes No Unknown
 Responds to standard antimicrobial treatment Yes No Unknown

Hospital Admission History

Has the case been admitted to a Hospital whilst symptomatic Yes No Unknown
 If yes, Name of the hospital _____
 Date of admission to hospital (dd/mm/yy) ____ / ____ / ____
 Has the case been in isolation Yes No Unknown
 Has the case been on mechanical ventilation Yes No Unknown
 If yes, is the case currently on mechanical ventilation Yes No Unknown
 Has the case been admitted to an Intensive Care Unit Yes No Unknown
 If not hospitalized, has the case been in home isolation Yes No Unknown

Annex 5. HPAI Case Notification Form (contd.)

History of exposure

Prior to their onset on illness, did the patient have close contact With a known probable or suspect case of AI

Yes No Unknown

If yes, in what country _____

City _____

Date of first contact (dd/mm/yy) ____ / ____ / ____

Date of last contact (dd/mm/yy) ____ / ____ / ____

During 7days preceding the onset of illness, did the case Travel to an “affected area”

Yes No Unknown

If yes, to which area (s) _____

During the 7 days prior to onset of illness, did the case travel overseas to any country besides ones listed above?

Yes No Unknown

If yes, to which country/countries: (List as many as needed) (dd/mm/yyyy)		
1	Date arrival __ / __ / __	Date departure __ / __ / __
2	Date arrival __ / __ / __	Date departure __ / __ / __
3	Date arrival __ / __ / __	Date departure __ / __ / __

For deceased patients ONLY

Unexplained respiratory illness resulting in death

Yes No Unknown

Autopsy examination performed

Yes No Unknown

If yes, did autopsy demonstrate pathology of Respiratory

Distress Syndrome without an identifiable cause

Yes No Unknown

Contact tracing

Has contact tracing been initiated

Yes No Unknown

If yes, is any contact currently residing abroad

Yes No Unknown

If yes, have the national Public Health Authorities of the recipient country been informed

Yes No Unknown

Initial case classification

Suspect

Probable

Discarded

(dd / mm / yyyy)

Date classified ____ / ____ / ____

Annex 5. HPAI Case Notification Form (contd.)

Final case classification

Confirmed

Probable

Discarded

(dd / mm / yyyy)

Date classified ____ / ____ / ____

Final status

Recovered

Discharged (date of discharge)

Died

Left country while symptomatic

• Medical evacuation

• Date of departure ____ / ____ / ____

• Flight details _____

• Destination country _____

Lost to follow-up

• Date of loss ____ / ____ / ____

(dd / mm / yyyy)

Date of death ____ / ____ / ____

Yes No Unknown

Name & Signature of reporting person: _____

Designation: _____

STAMP

Annex 6 WHO Laboratory Biosafety Guidelines for Handling Specimens Suspected of Containing Avian Influenza A Virus



General recommendations

The possibility that an influenza infection in humans caused by avian influenza A viruses could occur following a laboratory accident is a risk to which it is crucial to be constantly alert. Efforts to minimize transmission of infection in humans will be compromised by breaches in laboratory biosafety.

Responsibility for developing a comprehensive safety policy, including a safety manual, and supporting programmes for its implementation normally rests with the director or head of an institute or laboratory. However, laboratory safety is also the responsibility of all supervisors and laboratory employees, and individual workers are responsible for their own safety and that of their colleagues.

Good microbiological technique is fundamental to laboratory safety. The use of safety equipment, combined with good procedures and practices, will help to reduce the risks involved in dealing with biosafety hazards. The most important concepts are outlined below.

- Standard precautions should always be followed; barrier protection (gowns, gloves) should be used whenever samples are obtained from patients. In addition to these standard precautions, eyes should be protected.
- Basic containment – Biosafety Level 2 (BSL2) – practices and procedures should be the minimum requirement for handling specimens.
- Examples of routine laboratory procedures that require BSL2 include:
 - routine diagnostic testing of serum and blood samples (including haematology and clinical chemistry).
 - manipulations involving neutralized or inactivated (lysed, fixed, or otherwise treated) virus particles and/or incomplete, non-infectious portions of the viral genome.
 - final packaging of specimens for transport to diagnostic laboratories for additional testing; specimens should already be in a sealed, decontaminated primary container.
- Good laboratory practices should be followed. Eating, drinking, smoking, applying cosmetics, and handling contact lenses are prohibited in the laboratory working areas.
- Personal protective equipment (gown, gloves, eye protection) should be worn in the laboratory when handling and processing specimens and performing diagnostic testing.
- All technical procedures should be performed in a way that minimizes the formation of aerosols and droplets.
- Biological safety cabinets or other physical containment devices should be used for all manipulations that may cause splashes, droplets, or aerosols of infectious materials (e.g. centrifugation, grinding, blending, vigorous shaking or mixing, sonic disruption, opening of containers of infectious materials whose internal pressure may be different from the ambient pressure).
- The use of hypodermic needles and syringes should be limited. They must not be used as substitutes for pipetting devices or for any purpose other than parenteral injection or aspiration of fluids from laboratory animals. Mouth pipetting must be strictly forbidden.
- Adequate and conveniently located biohazard containers should be available for disposal of contaminated materials.
- Work surfaces must be decontaminated after any spill of potentially dangerous material and at the end of the working day. Generally, 5% bleach solutions are appropriate for dealing with bio-hazardous spillage.
- Personnel must wash their hands often – especially after handling infectious materials and

Annex 6 WHO Laboratory Biosafety Guidelines for Handling Specimens Suspected of Containing Avian Influenza A Virus (contd.)

- animals, before leaving the laboratory working areas, and before eating.
- Personal protective equipment must be removed before leaving the laboratory.

Laboratories must meet basic BSL2 standards and use BSL3 work practices to be able to safely:

- Aliquot and/or dilute specimens.
- Perform diagnostic testing that does not involve propagation of viral agents in vitro or in vivo.
- Perform nucleic acid extractions that involve untreated specimens.
- Prepare smears using heat or chemical fixation.

BSL3 practices cover the following areas:

- Any procedure that may generate aerosols or droplets should be performed in a biological safety cabinet (e.g. sonication, vortexing).
- Laboratory workers should wear protective equipment, including disposable gloves, solid-front or wrap-around gowns, scrub suits, or coveralls with sleeves that fully cover the forearms, head coverings and, where appropriate, shoe covers or dedicated shoes, eye protection and a surgical mask, or full-face shield, because of the risk of aerosol or droplet exposure when performing specific manipulations.
- Centrifugation of specimens should be performed using sealed centrifuge rotors or sample cups. These rotors or cups should be unloaded in a biological safety cabinet.
- Work surfaces and equipment should be decontaminated after specimens are processed. Standard decontamination agents that are effective against non-enveloped viruses should be adequate if used according to the manufacturer's recommendations. Generally, 5% bleach solutions are appropriate for dealing with biohazardous spillage. More information on disinfection and sterilization is provided in the WHO laboratory biosafety manual.
- Biological waste contaminated with suspect or confirmed influenza A/H5 specimens should be treated as outlined in the WHO laboratory biosafety manual.

When a procedure or process cannot be conducted within a biological safety cabinet, appropriate combinations of personal protective equipment (e.g. respirators, face shields) and physical containment devices (e.g. centrifuge safety cups or sealed rotors) must be used.

WHO strongly recommends that the BSL3 precautions described above are adopted and followed for work in BSL2 laboratories with influenza A/H5 virus specimens.

Where laboratory facilities do not meet at least basic BSL2 containment conditions, specimens should be referred to suitably equipped reference laboratories for primary diagnostic tests.

For laboratories that meet BSL3 containment standards and are operated by staff trained in the use of appropriate BSL3 work practices, the following procedures can be undertaken:

- Diagnostic tests that involve propagation of viral agents in vitro or in vivo.
- Work involving the replication of influenza A/H5 virus in cell culture and/or storage of cell culture isolates.
- Recovery of viral agents from cultures of influenza A/H5 specimens.
Manipulations involving growth or concentration of influenza A/H5 virus.

Annex 7 World Health Organization (EMRO) H5N1 Reference Laboratories



National Influenza Centers

Egypt - Cairo

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Guidelines for the collection of human specimens for laboratory diagnosis of influenza with pandemic potential

All patients with suspected pandemic influenza should have respiratory tract samples collected for virus detection, as well as acute and convalescent serum samples. Specimens for virus isolation or for detection of viral nucleic acids or antigens should be taken preferably during the first three days after onset of clinical symptoms, but may be taken up to a week after onset, or even later in severely ill or immunocompromised patients. Investigations should also be undertaken for other potential causes of the illness as deemed appropriate by the attending physician.

Type of specimens

In all cases an upper respiratory tract sample should be collected. A swab collected from each nostril, and a throat swab pooled into the same container of viral transport medium is the specimen of choice. Nasopharyngeal swabs may be collected instead of nose and throat swabs. Swabs pose a lower risk of infection of staff than do nasopharyngeal aspirates (NPA) or nasal washes, both of which may generate aerosols. They are suitable for testing by polymerase chain reaction (PCR) which is a rapid, sensitive test employed by most public health laboratories. They can also be used for virus isolation, but are not suitable for antigen detection test such as immunofluorescent antigen detection (IFA).

Where antigen detection tests are the only rapid tests available, then NPA or a nasal wash should be collected, provided that they can be performed within a controlled environment using suitable respiratory precautions. Samples collected for antigen detection tests may also be used for NAD and culture.

In addition to swabs from the upper respiratory tract, invasive procedures such as bronchoalveolar lavage or lung biopsy can be performed for the diagnosis of virus infections of the lower respiratory tract where clinically indicated. Post mortem samples may also be submitted. In all cases these procedures must be performed within a controlled environment using suitable respiratory precautions.

An acute-phase serum specimen (7-10 ml of whole blood) should be taken soon after onset of clinical symptoms and not later than seven days after onset. A convalescent-phase serum specimen should be collected 14 days after the onset of symptoms. Where patients are near death, a second ante-mortem specimen should be collected even if 14 days has not elapsed.

Nasal swab

A dry swab is inserted into the nostril (only as far as the anterior end of the nasal turbinate), parallel to the palate, and left in place for a few seconds. It is then slowly withdrawn with a rotating motion. Specimens from both nostrils are obtained with the same swab. The tip of the swab is put into a vial of virus transport medium and the applicator stick is broken off. This can be combined with the throat swab and/or nasopharyngeal swab in a single vial of virus transport medium. The virus transport medium should be stored and transported at 4°C and delivered promptly to the laboratory.

Nasopharyngeal swab

A flexible, fine-shafted swab is inserted into the nostril and back to the nasopharynx and left in place for a few seconds. It is then slowly withdrawn with a rotating motion. A second swab should

ANNEX 8 Laboratory Guidelines for Sample Collection (contd.)

be used for the second nostril. The tip of the swab is put into a vial of virus transport medium and the applicator stick is broken off. This can be combined with the throat swab and/or nasal swab in a single vial of virus transport medium. The virus transport medium should be stored and transported at 4°C and delivered promptly to the laboratory.

Nasopharyngeal aspirate

Nasopharyngeal secretions are aspirated through a catheter connected to a mucus trap and fitted to a vacuum source. The catheter is inserted into the nostril parallel to the palate. The vacuum is applied and the catheter is slowly withdrawn with a rotating motion. Mucus from the other nostril is collected with the same catheter in a similar manner. After mucus has been collected from both nostrils, the catheter is flushed with 3 ml of transport medium. The virus transport medium should be stored and transported at 4°C and delivered promptly to the laboratory. Specimens for direct detection of viral antigens by immunofluorescence staining of infected cells should be processed within 1–2 hours.

Nasal wash

The patient sits in a comfortable position with the head slightly tilted backward and is advised to keep the pharynx closed by saying "K" while the washing fluid (usually physiological saline) is applied to the nostril. With a transfer pipette, 1–1.5 ml of washing fluid is instilled into one nostril at a time. The patient then tilts the head forward and lets the washing fluid flow into a specimen container. The process is repeated with alternate nostrils until a total of 10–15 ml of washing fluid has been used. Dilute approximately 3 ml of washing fluid 1:2 in transport medium.

Throat swab

Both tonsils and the posterior pharynx are swabbed vigorously. The tip of the swab is put into a vial of virus transport medium and the applicator stick is broken off. This can be combined with the nasopharyngeal swab and/or nasal swab in a single vial of virus transport medium. The virus transport medium should be stored and transported at 4°C and delivered promptly to the laboratory.

Serum

Blood should be collected in the usual manner for serum samples. Specimens should be stored and transported at 4°C and delivered promptly to the laboratory.

Specimen collection, storage and transport Specimen

Collection poses a risk of aerosol production and recommended precautions should be followed closely. Consult annex 1:

Specimens should be packaged and transported as per standard recommendations for infectious substances. Use a 'No Touch' technique when packing samples and ensure that the exterior surface of the package should be clean. Double-bag if necessary. Pneumatic tube delivery systems should not be used, as any breakage or leakage within the pneumatic system could contaminate an entire institution.

ANNEX 8 Laboratory Guidelines for Sample Collection (contd.)

Samples for transport between laboratories should be transported in the usual manner. It is essential that the laboratory receiving the sample is aware that it comes from a potential pandemic influenza case and that it has the facilities required to safely handle the sample.

Where an isolate or suspicious organism is being referred to a reference laboratory for further testing, then transport the specimen as an Infectious Substance (Model Regulations and Packing Instruction 602 of the IATA Dangerous Goods Regulations). Telephone contact should be made with the receiving public health laboratory to facilitate safe and rapid processing of the specimens.

Once cases of influenza are sufficiently widespread in the community this individualised management of specimens may cease by agreement between the laboratory and public health officers.

Specimen processing

Specimens processing and laboratory biosafety

1. Requirements for laboratory staff involved in the collection and processing of samples

Staff from high risk groups for complicated influenza should be excluded from these activities unless absolutely necessary. High standards of personal hygiene are important in minimising the risk to staff.

2. Laboratory staff prophylaxis

Laboratory staff should be vaccinated against the currently circulating influenza strain, and if available, the new pandemic strain. Staff involved in cell culture in BSL3 conditions should be offered prophylaxis with a neuraminidase inhibitor. A protocol for management of accidental exposure of staff to a pandemic influenza strain, including post-exposure prophylaxis with a neuraminidase inhibitor, antiviral drug should be in place in laboratories processing respiratory specimens, and doses of an appropriate drug stored in the laboratory for this purpose. As the pandemic progresses, it is anticipated that there will be staff who will have acquired infection in the community and recovered. Those staff should be preferentially used for specimen collection and processing.

3. Personal protective equipment (PPE)

All staff potentially exposed to samples known or suspected to contain pandemic influenza should wear suitable PPE and must be trained in its proper use.

4. Decontamination

Work surfaces and equipment should be decontaminated after specimen processing. Standard laboratory decontamination protocols using 0.5% hypochlorite or 2% glutaraldehyde are sufficient.

5. Specimen processing

Blood and urine specimens processed outside of microbiology or histopathology laboratories should be handled using standard precautions in BSL2 laboratories.

For microbiological and anatomical pathology laboratory specimens the following procedures can be carried out under BSL2 precautions:

- Pathological examination and processing of formalin-fixed or otherwise inactivated tissues
- Molecular analysis of extracted nucleic acid preparations
- Electron microscopic studies with glutaraldehyde-fixed grids
- Routine examination of bacterial and fungal cultures following the initial inoculation
- Routine staining and microscopic analysis of fixed smears
- Final packaging of specimens for transport to diagnostic or reference laboratories for additional testing. Specimens should already be in a sealed, decontaminated primary container.

Activities involving manipulation of untreated respiratory specimens may be performed in BSL2 facilities, but with more stringent work practices as described below. These activities include:

- Cut up, blocking and macroscopic description of respiratory tissue
- Aliquoting and/or diluting specimens
- Inoculation of bacterial, fungal and virological culture media
- Performing diagnostic tests that do not involve propagation of viral agents.
- Nucleic acid extraction procedures involving untreated specimens
- Preparation and chemical- or heat-fixing of smears for microscopic analysis.

Stringent measures to be employed for these activities in BSL2 facilities include:

- Medical laboratory staff should wear protective equipment, including disposable gloves, disposable solid front gowns with cuffed sleeves that are either impermeable or covered with a plastic apron, full eye protection and respiratory protection, preferably a N-95 particulate filter mask but a surgical mask may be substituted if necessary provided that the work is carried out in a biological safety cabinet. Personnel who cannot wear these masks because of facial hair or other fit-limitations should wear loose fitting hooded or helmeted PAPRs.
- Gowns, gloves and masks should be discarded after the specimens have been processed. Remove the mask after the gown and gloves. Do not touch the mask front when removing mask from face- the mask tabs only should be touched. Careful attention should be given to hand hygiene after removal of protective clothing and especially before touching the face; contact with eyes and mucosal surfaces should be minimised.
- All specimen manipulations should be carried out in a certified biological safety cabinet class 1, 2 or 3. Aerosol producing procedures should be carried out in a biological safety cabinet and centrifugation should be carried out using sealed centrifuge cups or rotors that are unloaded in a biological safety cabinet.
- The following activities require PC3 facilities and PC3 work practices:
 - o viral cell culture procedures other than the primary inoculation
 - o Initial characterisation of viral agents recovered in cultures.

Once viable virus has been inactivated (for example by addition of guanidinium isothiocyanate in a nucleic acid extraction protocol, use of a solvent fixative such as 2% glutaraldehyde for electron microscopic examination or acetone for immunofluorescent examination, exposure to 50 kG γ -irradiation or other inactivation protocol with demonstrated efficacy) material may be removed from the PC3 facility for further characterisation. Particular care should be taken to ensure that the inactivation protocol is properly executed. The outside of specimen containers must be decontaminated prior to removal from the PC3 facility to ensure no transfer of viable virus.

Testing protocols

1) Nucleic acid testing

In most public health laboratories the test of choice for detection of influenza due to a potential new pandemic strain will be PCR using primers capable of detecting all 16 potential haemagglutinin (HA) types of influenza. The matrix (M) protein is the influenza gene target most commonly employed for such broadly reactive assays. Ideally these broadly reacting tests would be used at all times for influenza diagnosis and surveillance, but as a minimum should be available during periods of heightened risk of cases of pandemic influenza.

Once the identity of a new pandemic strain is known it may be possible to make greater use of HA type specific PCR assays in primary diagnosis. Once cases are widespread in the community, a type-specific laboratory diagnosis of influenza will probably become superfluous, unless multiple different strains are circulating concurrently.

2) Immunofluorescent assays

Immunofluorescent (IFA) assays using standard reagents potentially provide a rapid non-type specific laboratory diagnosis of influenza where PCR is not available. Standard influenza IFA reagents are capable of detecting H5N1 influenza. Specific reagents for H5 influenza are becoming available. IFA's effectiveness in detecting other potential pandemic influenza strains remains to be established, and it is less sensitive than PCR. Therefore, in the early stages of a pandemic, all samples from suspected cases must be referred for testing by PCR and cell culture in addition.

As IFA usually requires an NPA or nasal wash, laboratories should be aware of the additional infection control precautions required for collection of these specimens.

3) Viral cell culture and rapid cell culture

Viral cell culture procedures, with the exception of initial inoculation of tube cultures with primary specimens, should be performed in a PC3 facility using PC3 work practices. Similarly characterisation of isolates recovered from such cultures should be undertaken in a PC3 facility using PC3 work practices. Material recovered from all cell cultures may be removed from the PC3 facility for further analysis once viable virus has been inactivated by a suitable protocol, as above.

Viral culture using Madin Darby Canine Kidney (MDCK) or Primary Monkey Kidney (PMK) cell lines using standard protocols will detect potential new pandemic strains. PCR provides the most reliable approach to identification of isolates until the effectiveness of IFA against the new pandemic strain is established.

ANNEX 8 Laboratory Guidelines for Sample Collection (contd.)

Conventional tube culture may take 4-7 days. This can be reduced to 1-3 days using shell vial or multi-well plates and staining after 48 hours of culture with commercially available monoclonal antibodies (Mabs). The efficacy of Mabs against a new pandemic strain would need to be established before this latter approach could be recommended.

4) Typing and subtyping

Definitive typing will be undertaken by the WHOCC using reference methods, including serological typing employing WHO reference antisera, and nucleic acid sequencing.

5) Point of care tests

No point of care tests with demonstrated efficacy in detecting a broad range of influenza subtypes are currently available.

6) Serology

Due to the delays in serological responses, the utility of serology tests for identifying pandemic activity will be limited. However they are likely to find use as a final exclusion of infection, or to maximise the case ascertainment rate in cases, especially where direct detection was not performed or was inadequate. There is a wide variety of approaches to serological testing for influenza antibodies exist and varying capacity and methodology is available in public health laboratories.

Samples from suspected cases should be submitted to the local public health laboratory for testing either at that laboratory or be referred to the WHOCC. Tests that will specifically detect antibody to the pandemic strain are required. Traditional haemagglutinin inhibition (HAI) provides a type specific diagnosis by demonstrating a single high titre or, preferably a rise in antibody between paired sera. This test is currently available for H5 influenza, but would not be available for other pandemic strains until antigen was supplied.

Neutralisation titres (NT) are technically more difficult but can be performed in laboratories that have the appropriate facilities for culture of the pandemic strain.

7) Diagnostic criteria

During the initial phase of laboratory screening for the first case, or cases of influenza attributable to a new pandemic strain, a highly specific laboratory case definition is recommended.

A laboratory proven case should be defined as one in which two different laboratory methods have given reactive results, or two different specimens have given reactive results, or alternatively in which reactivity has been confirmed in a second laboratory. When pandemic activity is first identified in Bahrain, positive results must be confirmed by the WHOCC by testing of the positive material (eg nucleic acid extract or isolate) and the original sample.

This degree of specificity, and possibly laboratory diagnosis itself will become superfluous as cases become widespread in the community.

ANNEX 9: Precautionary Measures Against the Important of H5N1 into Bahrain

Border Control for Pandemic Influenza

Precautionary Measures Against the Importation of H5N1 into Bahrain.

In view of the fact that vessel arriving from Avian influenza infected countries may have a person who may be incubating the disease and subsequently develop signs and symptoms of Avian influenza, the following are the control measures to be taken on arriving from Avian influenza infected countries:

a) Sea travel

1. If 7 days has elapsed since the ships departure from the infected country, the ship is authorized to come alongside. Public health specialist will board the ship and carry out a medical examination of all the ships crew. If the findings show that there is no suspected case on board, the port authority will be given permission to commence operation. viz. shore personnel to embark. However the crew members will be permitted to come ashore only after 7 days has elapsed since the ship's arrival in Bahrain.
2. If there is a suspected Avian influenza case onboard, the ship should not be given free pratique' and should not be brought alongside and the Public Health Authorities must be notified immediately.
 - The ship will be boarded by the doctor. The case will be transferred to the hospital and isolated, the crew members will be examined by the doctor to search for any undetected case.
 - The ship and all the crew members will be placed in quarantine for 7 days, beginning from the day the case was isolated. Thereafter the crew members should not be Permitted to come ashore.
 - Disinfection of all articles and surfaces of the rooms frequented by the case will be carried out.
3. If transmission of influenza has been reported among ship passengers.
 - Close contacts of an infectious case are at highest risk of infection.
 - Ships should have sufficient PPE and hand washing facilities (or alcohol-based hand wipes), to manage infectious cases and protect staff.
 - Prior to departure, passengers should be advised to immediately report symptoms of Influenza to the crew.

In general, the recommended infection control precautions for sea travel are the same as for air travel. However, the following, additional recommendations apply:

- Infectious cases should be isolated from other travelers as soon as possible
- If the infectious cases is a crew member, then the person should be relieved of his or her duties and be isolated
- The master of the vessel should immediately inform the BQIS about the suspected case and record the name, the date of onset of symptoms and the symptoms of the suspected case, and the names, cabin numbers, home addresses and phone numbers of the crew and passengers who were on board the vessel at the same time as the infectious case.

ANNEX 9: Precautionary Measures Against the Important of H5N1 into Bahrain (contd.)

b) Air travel

Symptomatic passengers

If a passenger reports or is observed to have symptoms of influenza, and the infectious period has not passed, then:

- The passenger should be isolated as much as possible from other passengers and crew.
- The passenger should be given a surgical mask to wear.
- Attending crew should wear full PPE as outlined under Personal protective equipment.
- For meals, the passenger should remove the mask and place it in a disposable bag, then wash his or her hands with an alcohol-based hand wash and place it in the disposable bag with the mask, and then dispose of the bag in general waste.
- Once his or her meal is finished, the passenger should be supplied with a new mask.
- The mask should be changed when it becomes moist or damaged.
- The captain of the aircraft must report the presence of symptomatic passengers to Bahrain Quarantine and Inspection Service, prior to landing (BQIS).

Attending crew

Crew members should wear full PPE when attending a symptomatic passenger and immediately wash their hands after removing their gloves and masks. If running water and soap are not available, then crew members should use alcohol-based hand wash to wash their hands. Used gloves and masks should be placed in a disposable bag, sealed, and disposed in general waste.

Cleaning passenger aircraft

Once an infectious passenger has left an aircraft, the main source of infection (ie respiratory secretions) has been removed. However, there may be residual respiratory secretions on environmental surfaces (eg seats). Thus, crew members cleaning the interior of passenger aircraft may be infected if they transfer respiratory secretions (eg with their hands) from an environmental surface to their eyes, noses or mouths. Cleaners should wear full PPE, avoid touching their eyes, noses or mouths, and immediately wash their hands after removing and disposing of their gloves in disposable bags in general waste.

Linen

Linen, such as pillows and blankets that have been in contact with a symptomatic passenger, should be transported in leak-resistant, closed laundry bags for washing. Special cleaning of upholstery, carpets and storage compartments is not required.

Assessment of infectious cases on arrival in Bahrain

Passengers or crew may be referred for assessment because they were symptomatic during travel or on arrival, because they were detected as having a temperature on thermal scanners or because they reported contact with an infectious case. In this situation, an BQIS officer will conduct the initial assessment in accordance with established BQIS procedures.

ANNEX 9: Precautionary Measures Against the Important of H5N1 into Bahrain (contd.)

Clinical assessment of passengers

After initial assessment, passengers may be referred to a nurse or doctor for clinical assessment.

Nurses or doctors should wear P2 (N95) masks, disposable gloves, protective eyewear, and long-sleeve, disposable gowns. In high-risk situations, cap and plastic apron may be required (see Personal protective equipment).

Nurses or doctors should avoid touching their eyes, noses or mouths until they have completed the clinical assessment, removed themselves from the enclosed space with infectious cases, disposed of their gloves, eyewear, masks, gowns, and washed their hands. If hand-washing facilities are not available, then an alcohol-based hand wash should be used.

Used masks, gloves, and gowns should be disposed of in a sealed bag in general waste, and reusable eyewear should be disinfected according to manufacturer's instructions.

Clinical equipment, such as stethoscopes, should be disinfected after the examination.

Surveillance protocols Algorithm for ports see Annex 14

International airport procedures for border nurse referrals

Border nurses are placed at international airports for the purposes of screening travelers for influenza only. They are not provided for general medical assessment

From the health declaration card, incoming travellers may be referred by Bahrain quarantine and inspection service (BQIS) staff for assessment by a nurse because they are unwell or because they have been in contact with a person with severe respiratory disease. Those identified as being unwell will be issued with a surgical mask and escorted to an interview room.

From the infra-red thermal imaging, incoming travellers may be referred for assessment by a nurse because they are suspected to have a fever, a prominent symptom of influenza. Those identified as having fever will be issued with a surgical mask and escorted to an interview room.

Prior to interview of the 'at risk' traveller, the interviewing border nurse should be aware of the infection control guidelines. (BQIS) staff should organise a medical interpreter if required. Care must also be taken to ensure that the interpreter is adhering to the infection guidelines. In the interview room, a questionnaire is to be administered to determine whether the unwell traveller should be referred to the Chief Quarantine Officer.

Actions by the border nurse

People who have symptoms of influenza like illness and have been in an affected area should be managed according to the flow chart.

ANNEX 9: Precautionary Measures Against the Important of H5N1 into Bahrain (contd.)

Outcomes

1. Isolate

People who have signs or symptoms of influenza like illness or contact with person(s) with influenza like illness before the onset of illness and have been in an affected area should be provided with a surgical mask.

The nurse should:

- Report the case to the chief quarantine officer (CQO) or duty medical officer by telephone; and
- Fax this record to an appropriate public health unit.

2. Health advice

People who do not need isolation after the assessment will be released with health advice given by the nurse. The nurse should advise them to continue monitor for any signs or symptoms of influenza like illness. If symptoms occur, these people should seek medical attention immediately and report their travel histories to the physician.

If the person is symptomatic and his/her temperature is less than 38°C, apart from health advice given, he/she should be

- Provided with a surgical mask; AND
- Provided with printed advice on managing their symptoms; AND
- A telephone number of an appropriate public health unit.

c) Causeway travel

- The precautionary measures same as sea travel (Annex 14)

ANNEX10 Key Infection Control Messages for the General Public

PROTECTING YOURSELF AND OTHERS AGAINST RESPIRATORY ILLNESS

- Hand washing is one of the most important measures to prevent the spread of infection.
- Anyone with respiratory-type illness should be careful with secretions from the nose and mouth .
- Cover the nose and mouth when coughing or sneezing - use a tissue and dispose of this once used in the waste.
- Always wash hands after having any contact with respiratory secretions.
- Be careful with respiratory secretions (eg coughing and sneezing) when around other people. It may be best to avoid contact with individuals at risk (small children or those with underlying chronic illnesses such as immune- suppression or lung diseases until respiratory symptoms have resolved.
- Avoid contact with secretions of people who have respiratory illnesses.
- Ask people to use a tissue and cover their nose and mouth when coughing

TRAVEL HEALTH

Have you recently arrived from overseas or returned from overseas?

Do you have fever, bad cough, trouble breathing, or otherwise feel unwell?

If yes

Please see a doctor about your symptoms

- When you see a doctor, tell them about your symptoms and that you have been overseas, without waiting to be asked.
- Cover your nose and mouth with a tissue when coughing or sneezing.
- Throw the tissue away in a bin afterwards and then wash your hands with soap and water

ANNEX 11 Agriculture Responses Relating to a Human Influenza Pandemic

a) Pandemic

Background

All commercial or domesticated poultry and numerous wild bird species are susceptible to infection with avian influenza virus. However, disease outbreaks occur most frequently in chickens and turkeys.

Avian influenza viruses can be brought into Bahrain by nomadic or migratory wild birds and then cycle through Bahrain wild or free-living waterfowl. The virus is more commonly associated with waterfowl (especially geese, ducks and swans) that generally show no signs of disease. However, if infected wild birds or their excretions (especially through contaminated water) come into contact with, and infect, domestic poultry outbreaks of severe disease can occur.

Animal infection overseas- low human public health risk (in Bahrain)

Current policy involves increased security at points of entry into Bahrain, upgraded biosecurity for poultry owners and a substantial on-going awareness campaign.

Animal infection overseas-substantial human public health risk

As above, but more intensive.

Animal infection in Bahrain- low human public health risk

A consultative committee is convened and intensive surveillance aimed to identify potential new cases instituted. Because of the risk of spread of virus by personnel, equipment and vehicles, the following procedures would be adopted to enable continuing surveillance while minimising multiple farm visits by inspectors and industry personnel:

- Dead bird pick-up and transport to a laboratory, for sampling and sending samples to a laboratory.
- Report on flocks by visits or telephone.
- Telephone survey.
- Serological testing.

There would be three phases for surveillance:

- Early in an outbreak to define the extent of infection by clinical signs and virus isolation.
- Later in an outbreak to re-enforce that the extent of infection has been determined when recovered flocks have seroconverted.
- If the disease becomes established and control procedures are applied, such as vaccination, some surveillance would continue to determine where infection has spread.

If the disease is designated to be highly pathogenic for poultry 'stamping out' would be instituted. This involves destruction of the infected poultry plus the sanitary disposal of the carcasses and any contaminated poultry products to remove the source of infection.

ANNEX 11 Agriculture Responses Relating to a Human Influenza Pandemic (contd.)

Animal infection in Bahrain- substantial human public health risk

As above, plus increased testing of other bird species in particular waterfowl will be carried out in the vicinity of the flocks. The extent of this will be determined by the consultative committee. Any other species exhibiting influenza-like illness will be tested and appropriate testing and surveillance of additional species as deemed appropriate by the Ministry of Municipalities & Agriculture Affairs.

Ministry of Municipalities & Agriculture Affairs will compile data on infected flocks and other species and provide this to Bahrain.

b) Inter-pandemic (or non-pandemic) period

The aim is to undertake a risk assessment and to then develop a surveillance program that will encourage a better understanding of avian influenza virus in birds in Bahrain. Such a system, although far from ideal due to the usually low prevalence of the virus, would also provide an early warning system.

Testing for avian influenza through the Bahrain quarantine strategy would also continue

WHO advice on the preparation of poultry for consumption

1) Avoid contamination:

Separate raw meat from cooked or ready – to eat foods. Do not use the same chopping board or the same knife for preparing raw meat and cooked or ready – to – eat foods. Do not handle both raw and cooked foods without washing your hands in between and do not place cooked meat back on the same plate or surface it was on before it was cooked.

2) Cook thoroughly:

Thorough cooking will inactivate influenza viruses. Either ensure that the poultry meat reaches 70° c or that the meat is not pink and there are no pink juices.

3) Be careful with eggs:

Egg, too, may carry pathogens, such as the bird - flu virus inside or on their shells. Care must be taken in handling raw eggs and shells. Wash hands afterwards. Egg yolks should not be runny or liquid. Do not use raw or soft- boiled egg in foods that will not be cooked.

4) Keep clean:

After handling raw or thawed raw poultry or eggs, wash your hands and all surfaces and utensils thoroughly with soap and water.

Types of vaccines, doses, and dosing schedule

Current seasonal influenza vaccines contain either inactivated influenza virus antigens or living, attenuated virus. Although there is some progress to registration of vaccines prepared from viruses grown in cell culture, the great majority are prepared from influenza cultivated in embryonated chicken eggs. Currently only inactivated, egg grown, vaccine are licensed for use in Bahrain.

Annual influenza vaccine formulation follows recommendations made by the World Health Organization

Current influenza vaccine

Currently, only influenza viruses that have been isolated and passaged exclusively in embryonated chicken eggs, or primary cell cultures derived from these, are permitted for use as vaccine strains. Reference viruses suitable for preparation of vaccine seed viruses are prepared and made available to vaccine manufacturers through the WHO Global Influenza Program.

In Bahrain, only single dose containers are currently approved and vaccines are supplied packaged as a 0.5ml dose in single-use syringes.

Vaccine development in the event of a pandemic

Registration of influenza vaccines for use in a pandemic may differ in a number of respects from the normal inter-pandemic vaccine. This may include use of a monovalent formulation, changes in antigen content, use of whole virus vaccines, incorporation of adjuvants, and distribution in multi-dose containers.

It is proposed that, in Bahrain, these changes will be expedited by a process of licensing ahead when the pandemic vaccine strain is known.

Distribution of the pandemic vaccine

Bahrain planned to sign agreements with pharmaceutical companies to supply the normal seasonal influenza vaccine for the next three influenza seasons and to made with the manufacturers a contractual commitment to provide sufficient vaccine to treat Bahrainis in the event of an influenza pandemic.

The Government will place purchase orders for the supply and delivery of pandemic vaccines supplies with the vaccine manufacturers in the event that a pandemic is declared or notified by WHO.

Pandemic vaccine priority groups

Initially, the vaccine will be in short supply and so its use will have to be prioritized.

Annex 12 Pandemic Vaccines (contd.)

Group	Rationale
Health care workers	<ul style="list-style-type: none"> • Health care workers are at increased risk of acquiring infection and passing it on to vulnerable patients. • Health care workers perform essential services. • Having health care staff available to care for the sick will reduce morbidity and mortality.
Other essential workers such as emergency personnel	<ul style="list-style-type: none"> • To maintain essential services.
Other groups most likely to transmit the virus such as children	<ul style="list-style-type: none"> • Consistent with the goal of containment.
Those at risk of severe outcome	<ul style="list-style-type: none"> • Reduction in demand for health care services. • Reduction in morbidity and mortality.

Even when the recommended priority groups are determined, they will be continually revised in light of new information that is learnt about the pandemic virus.

When sufficient pandemic influenza vaccine is available, population will be offered vaccination.

Seasonal influenza vaccine

The seasonal influenza vaccine normally contains three strains of virus, two current influenza A subtypes and influenza B, representing recently circulating viruses. The composition of vaccines for use in Bahrain is determined each year by the recommendations from the WHO.

During the lead up to a pandemic, when the novel influenza vaccine is still in production, it will have an important role to play in preventing simultaneous infection with the seasonal influenza strain and a novel influenza strain. There is the small possibility that if a person is infected with both of these viruses at the same time, the virus could share genetic material to produce a new and highly transmissible virus that poses the threat of a pandemic. Therefore, it is recommended that poultry workers who are, or will be exposed to infected or potentially infected poultry or their environment, receive the seasonal influenza vaccine.

Attaining high rates of coverage of the normal seasonal influenza vaccine and the pneumococcal vaccine in identified cohorts and high risk groups during the nonpandemic period was identified as a priority in the Bahrain Action Plan for Pandemic Influenza (2006).

Seasonal influenza vaccination is also recommended for certain high risk groups to lessen the morbidity and mortality associated with seasonal influenza infection.

Annual influenza vaccination recommended for the following groups:

1. All individuals aged 65 years and over.
2. Children (\geq six months of age) and adults with chronic cardiac conditions including cyanotic

- congenital heart disease, coronary artery disease and congestive heart disease.
3. Children (six months of age) and adults with chronic suppurative lung disease, including bronchiectasis, cystic fibrosis and chronic emphysema.
 4. Children (six months of age) and adults with chronic illnesses requiring regular medical follow-up or hospitalisation in the preceding year.
 5. Persons with immune deficiency, including HIV, malignancy and chronic steroid use.
 6. Residents of nursing homes and other long-term care facilities, due to high rates of transmission during outbreaks.
 7. Contacts of high risk patients, including health care providers, staff of nursing homes and long-term care facilities.

For further details about recommendations, transport, storage, handling, dosage, administration, adverse events, precautions, contra-indications, and use in pregnancy refer to Bahrain immunization manual 2004.

The pneumococcal vaccine

Many deaths and severe infections precipitated by influenza are due to secondary infection with bacterial pathogens such as *Streptococcus pneumoniae*. The pneumococcal vaccine, administered to high-risk groups of the population, can significantly reduce the incidence of this secondary infection and hence reduce the morbidity and mortality associated with influenza. Increasing pneumococcal vaccine coverage in high risk groups will therefore have a role in potentially lessening the impact of an influenza pandemic.

The 23-valent pneumococcal polysaccharide vaccine recommended for:

1. All individuals aged 65 years and over.
2. Adults who have any of the high risk underlying conditions.
3. Children aged 2 years and over who have underlying chronic illnesses predisposing to invasive pneumococcal disease (including asplenia and immunocompromised).
4. Individuals aged over two years with asplenia, either functional or anatomical.
5. Immuno-compromised persons aged over two years at increased risk of invasive pneumococcal disease (eg patients with HIV infection before the development of AIDS, acute nephrotic syndrome, multiple myeloma, lymphoma, Hodgkin's disease and organ transplantation).
6. Immunocompetent persons aged over two years at increased risk of complications from invasive pneumococcal disease because of chronic illness (eg chronic cardiac, renal, or pulmonary disease, diabetes, alcohol-related problems).
7. Persons with CSF leaks (aged over two years).
8. As a booster dose, at four-five years of age, following a primary course of the 7-valent pneumococcal conjugate vaccine, in children at risk of either high incidence or severity of invasive pneumococcal disease because of predisposing medical conditions.

The 7-valent pneumococcal conjugate vaccine recommended for:

Children under the age of two years with underlying medical conditions predisposing them to invasive pneumococcal disease:

- o Diseases compromising immune response to pneumococcal infection such as congenital immune deficiency, immunosuppressive therapy, compromised splenic function, HIV infection before and after the development of AIDS, renal failure and Down's syndrome.
- o Anatomical or metabolic abnormalities associated with higher rates or severity such as cardiac disease, premature infants with chronic lung disease, infants born at less than 28 weeks gestation, cystic fibrosis, insulin-dependent diabetes mellitus, CSF leaks and intra-cranial shunts and cochlear implants.

For further details about recommendations, transport, storage, handling, dosage, booster doses, catch-up schedules, administration, adverse events, precautions, contra-indications, and use in pregnancy refer to The Bahrain Immunization Manual 2004.

Background to the National Medicines Stockpile (NMS)

Influenza antiviral drugs will play an important role during a pandemic, particularly during the first wave of infection when pandemic vaccines may not be available. In the absence of vaccines, antivirals are the only medical intervention for providing protection against disease and some therapeutic benefit in those who are ill. Unlike pandemic vaccines, antivirals are expected to be immediately effective.

Activation and deployment of the NMS

The process to activate the NMS deployment plan is that the Chief of the Diseases Control Section at the public health provides written request to the DMM for access to the NMS.

The amount of medication deployed will be a decision of the DCS after discussion with the MOH avian flu committee members. Each Department required to have distribution plans in place, including details of security measures and arrangements for dispensing including supervision, records of treatment and monitoring of outcomes, and adverse events. The DMM has ownership of the stockpile until each item is used/consumed/expired.

In the event of PHD requiring additional medicines – for example, antibiotics for secondary bacterial chest infections – or personal protective equipment, the above process will need to be carried out for each request.

Priority groups

The role of influenza antivirals will be constrained, however, by their finite supply, negligible surge capacity for production, and cost. Because of this, priority groups for their use will be determined to ensure that they are used to Bahrain's best advantage. As the overall aim underlying Bahrain's response to a pandemic influenza threat is to reduce the associated population-wide morbidity and mortality, their use will be determined within this principle.

The DCS made recommendations about antiviral priority groups in light of the current evidence. New evidence will need to be considered continually and the recommendations revised accordingly.

Determination of the use of antivirals will be:

- Assessed by the DCS.
- Reviewed by the MOH AFC.

The recommended priority groups will be based on the best available evidence.

Currently this includes:

- antivirals–neuraminidase inhibitors– are effective in preventing influenza. if given within 48 hours, antivirals are effective in reducing the severity of the symptoms of influenza and shortening of the course of illness.
- it is unproven that the use of antivirals for treatment also reduces transmission of the virus.
- it is unproven that antivirals used for treatment of influenza reduce mortality in humans, although in some animal studies mortality is reduced. During a pandemic, urgent research will be undertaken to determine transmission dynamics and efficacy of treatment.

Containment phases

During the early phases, containing the spread of a pandemic, and thus preventing infections from occurring in the first place, will be the strategy for reducing morbidity and mortality. During these phases, antivirals may be best used to prevent entry of the virus into Bahrain or limit the spread amongst those who are exposed to human or animal cases of pandemic influenza. With this approach, antivirals may be given as post-exposure prophylaxis to those who have been exposed (health care workers, border workers and poultry cullers).

Treatment

In the early phases, a proportion of the antiviral stock will be set aside for identified cases and their close contacts.

Prophylaxis

With regard to prophylaxis, it is recommended that the antivirals are used in the containment phase for those individuals:

- who are exposed to a person or animal likely to be infected with pandemic influenza.
- who work in areas where there is a high likelihood of exposure, such as:
 - Poultry workers and animal disease control officers exposed to HPAI.
 - Border workers who are at higher risk of exposure.
 - Health care workers caring for influenza patients or patients with undiagnosed respiratory disease in which pandemic influenza is a differential diagnosis.
 - Staff at quarantine facilities.
 - Public health staff exposed to potential cases.
 - Laboratory staff at high risk of exposure.

Maintenance of essential services phases

During the later phases, containment may not be possible and the optimal strategy for reducing morbidity and mortality will be to maintain essential services. This will ensure minimal disruption to the provision of health and emergency services to the community. It will be vital, therefore, to provide antivirals as prophylaxis to essential service workers.

Teams providing essential services will need to be designated by all governments and may include:

- Health care workers at designated-influenza treatment facilities.
- Laboratory personnel.
- Power supply.
- Water supply.
- Telecommunications personnel.
- Sewage workers.
- Funeral workers.
- Emergency service workers.
- Key decision makers.

Long-term prophylaxis

-- Review of priority groups

It is recommended that the designation of antiviral priority groups is reconsidered both in containment and maintenance of essential services phases frequently in relation to:

- Location of cases.
- Rate of transmission.
- Attack rates in different age groups.
- Clinical severity in different age groups (for example isolated overseas outbreak).
- Potential strategies for control.
- Depletion of the antiviral stockpile.

-- Resistance

The efficacy of the antivirals and the development of clinical resistance in the pandemic virus need to be monitored for both treatment and prophylaxis. The H5N1 strain of influenza A currently circulating in some parts of the world is resistant to amantadine.

-- Influenza antiviral available in Bahrain

The current antiviral medicine can shorten the course of infection if given early in the disease (treatment) and provide short-term protection against influenza (prophylaxis). Oseltamivir is registered for supply Antiviral available in Bahrain.

Drug class	Generic name	Route of administration	Indication *
Neuraminidase inhibitor	Oseltamivir	Oral Capsules or Suspension)	Prophylaxis - Age>13 years Treatment – Age > one year

* When used for treatment, neuraminidase inhibitors must be commenced within 48 hours of onset of symptoms. After this time, they are not effective.

OSELTAMIVIR

Oseltamivir phosphate is a pro-drug of the active metabolite oseltamivir carboxylate. The active metabolite is a selective inhibitor of influenza virus neuraminidase enzymes, which are glycoproteins found on the virion surface. Viral neuraminidase is essential for the release of recently formed virus particles from infected cells and the further spread of infectious virus in the body.

Oseltamivir inhibits neuraminidases of influenza viruses of both types A and B. The active metabolite also inhibits influenza virus growth in vitro and inhibits influenza virus replication and pathogenicity in animal models. Oseltamivir is approved for both treatment of infections due to influenza A and B viruses in adults and children aged one year and older and prevention of influenza in adults and adolescents 13 years and older.

Treatment should commence as soon as possible, but no later than 48 hours after the onset of the initial symptoms of infection. Vaccination is the preferred method of routine prophylaxis against infection with influenza virus.

- Resistance

The incidence of viral resistance in samples derived from clinical isolates is about 2%, depending on viral subtype. The limited resistance data available relates predominantly to H3N2 isolates, with few H1N1 or B virus isolates currently studied.

- Precautions

Influenza with complications eg pneumonia; renal impairment; repeated courses (no data); fructose intolerance (oral suspension); pregnancy, lactation, children < one year.

- Adverse reactions

Gastrointestinal upset; insomnia; headache; fatigue; others.

- Dosage and administration

Oseltamivir is administered as an oral capsule of 75mg, or as an oral suspension of 12mg/ml.

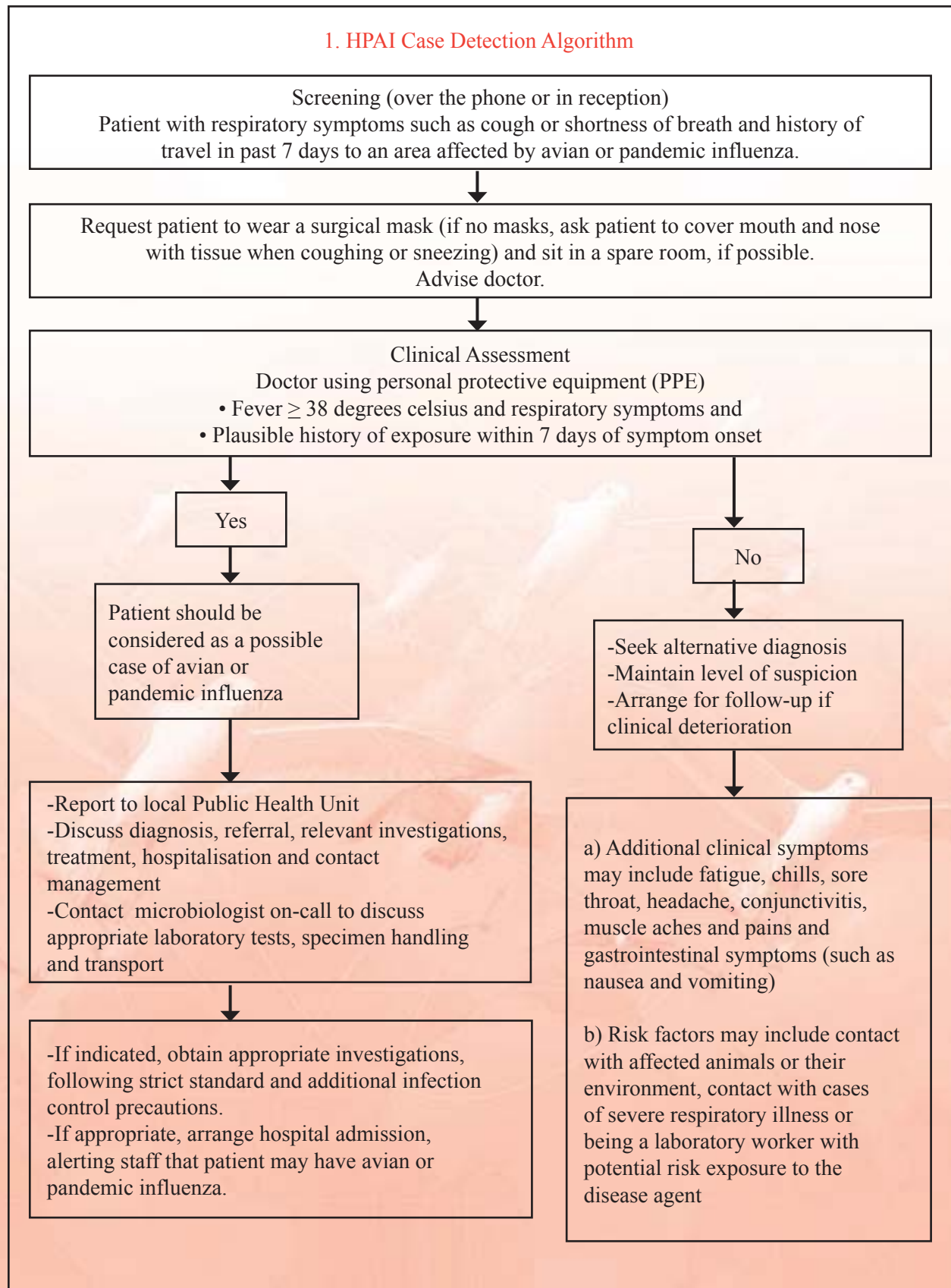
- Treatment of influenza:

Adults and adolescents. The recommended oral dose of oseltamivir in adults and adolescents 13 years of age and older is 75 mg TWICE daily for five days. Oseltamivir can be given to patients one year of age and older.

- Prophylaxis of influenza:

Adults and adolescents. The recommended oral dose of oseltamivir in adults and adolescents 13 years of age and older is 75 mg ONCE daily for five days. Oseltamivir can be given to patients one year of age and older.

Safety and effectiveness have been shown in patients taking oseltamivir for up to six weeks.



Annex 14 Surveillance Forms (contd.)

2. HPAI Case Notification Form

Case No.

Reporting Details

Reporting date (dd/mm/yy) ____ / ____ / ____
 Reporting institution _____
 Contact Tel No: _____

Demographic details

Sex Male Female Unknown
 Date of Birth (dd/mm/yy) ____ / ____ / ____ OR Age (years) ____
 Usual country residence _____
 Nationality _____
 Health Care Worker Yes No Unknown
 If NO then occupation: _____
 Contact Name: _____ Tel No: _____
 Address: House No: _____ Road No: _____ Block No: _____ Area: _____

Sign and symptoms

Date of onset of initial symptoms (dd/mm/yy) ____ / ____ / ____
 Body temperature higher than 38°C Yes No Unknown
 Cough Yes No Unknown
 Difficulty in breathing Yes No Unknown
 Clinical findings of Respiratory Distress Syndrome Yes No Unknown

Chest X-ray performed Yes No Unknown
 If yes, evidence of pneumonia or Respiratory Distress Syndrome Yes No Unknown
 Responds to standard antimicrobial treatment Yes No Unknown

Hospital Admission History

Has the case been admitted to a Hospital whilst symptomatic Yes No Unknown
 If yes, Name of the hospital _____

Date of admission to hospital (dd/mm/yy) ____ / ____ / ____
 Has the case been in isolation Yes No Unknown
 Has the case been on mechanical ventilation Yes No Unknown
 If yes, is the case currently on mechanical ventilation Yes No Unknown
 Has the case been admitted to an Intensive Care Unit Yes No Unknown
 If not hospitalized, has the case been in home isolation Yes No Unknown

Annex 14 Surveillance Forms (contd.)

History of exposure

Prior to their onset on illness, did the patient have close contact With a known probable or suspect case of AI

Yes No Unknown

If yes, in what country _____

City _____

Date of first contact (dd/mm/yy) ____ / ____ / ____

Date of last contact (dd/mm/yy) ____ / ____ / ____

During 7days preceding the onset of illness, did the case Travel to an “affected area”

Yes No Unknown

If yes, to which area (s) _____

During the 7 days prior to onset of illness, did the case travel overseas to any country besides ones listed above?

Yes No Unknown

If yes, to which country/countries: (List as many as needed) (dd/mm/yyyy)		
1	Date arrival __ / __ / __	Date departure __ / __ / __
2	Date arrival __ / __ / __	Date departure __ / __ / __
3	Date arrival __ / __ / __	Date departure __ / __ / __

For deceased patients ONLY

Unexplained respiratory illness resulting in death

Yes No Unknown

Autopsy examination performed

Yes No Unknown

If yes, did autopsy demonstrate pathology of Respiratory

Distress Syndrome without an identifiable cause

Yes No Unknown

Contact tracing

Has contact tracing been initiated

Yes No Unknown

If yes, is any contact currently residing abroad

Yes No Unknown

If yes, have the national Public Health Authorities of the recipient country been informed

Yes No Unknown

Initial case classification

Suspect

Probable

Discarded

(dd / mm / yyyy)

Date classified ____ / ____ / ____

Annex 14 Surveillance Forms (contd.)

Final case classification

Confirmed Probable Discarded

(dd / mm / yyyy)
Date classified ___ / ___ / ___

Final status

Recovered
 Discharged (date of discharge)
 Died
 Left country while symptomatic

(dd / mm / yyyy)
Date of death ___ / ___ / ___

- Medical evacuation
- Date of departure ___ / ___ / ___
- Flight details _____
- Destination country _____

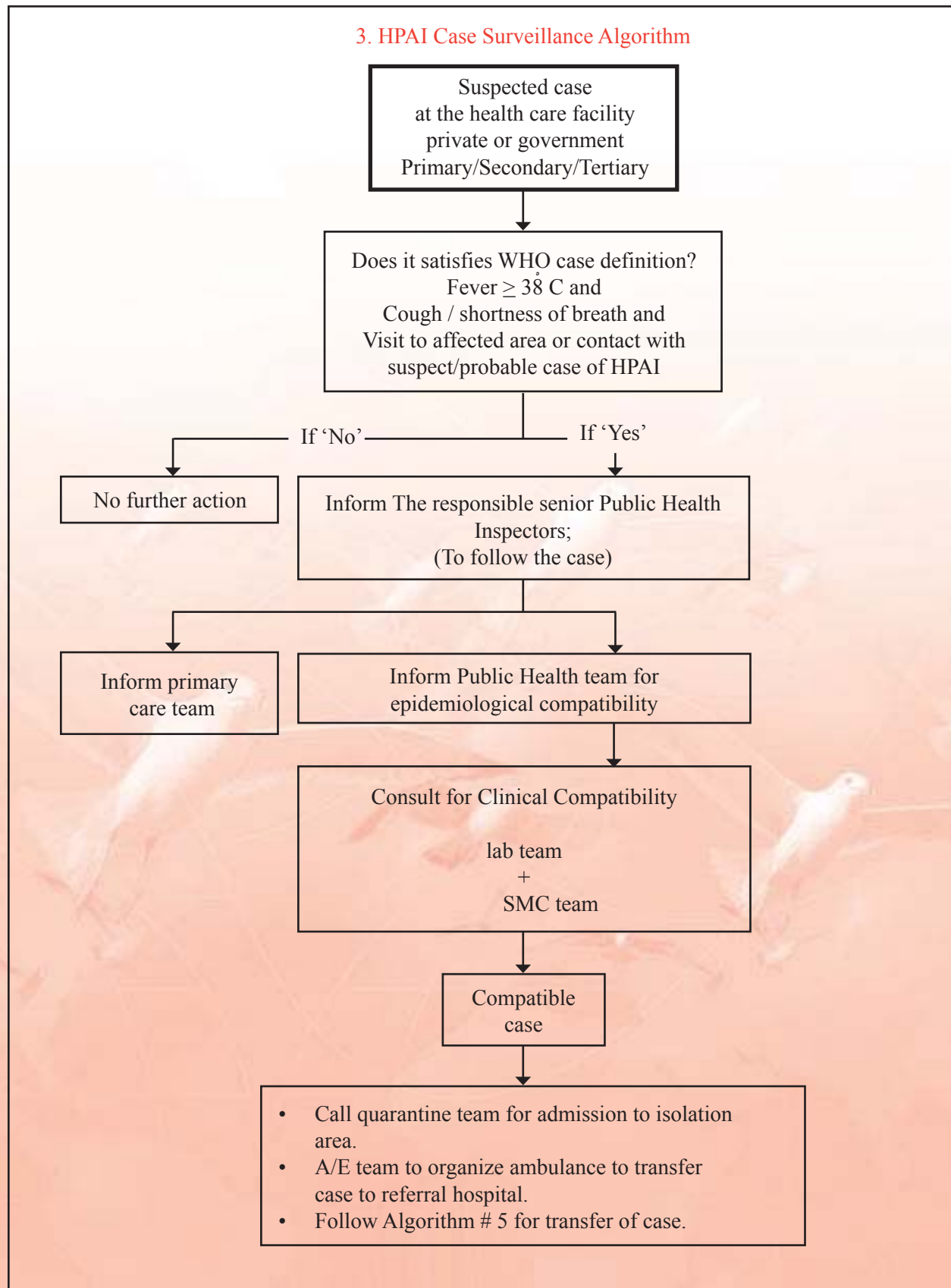
Yes No Unknown

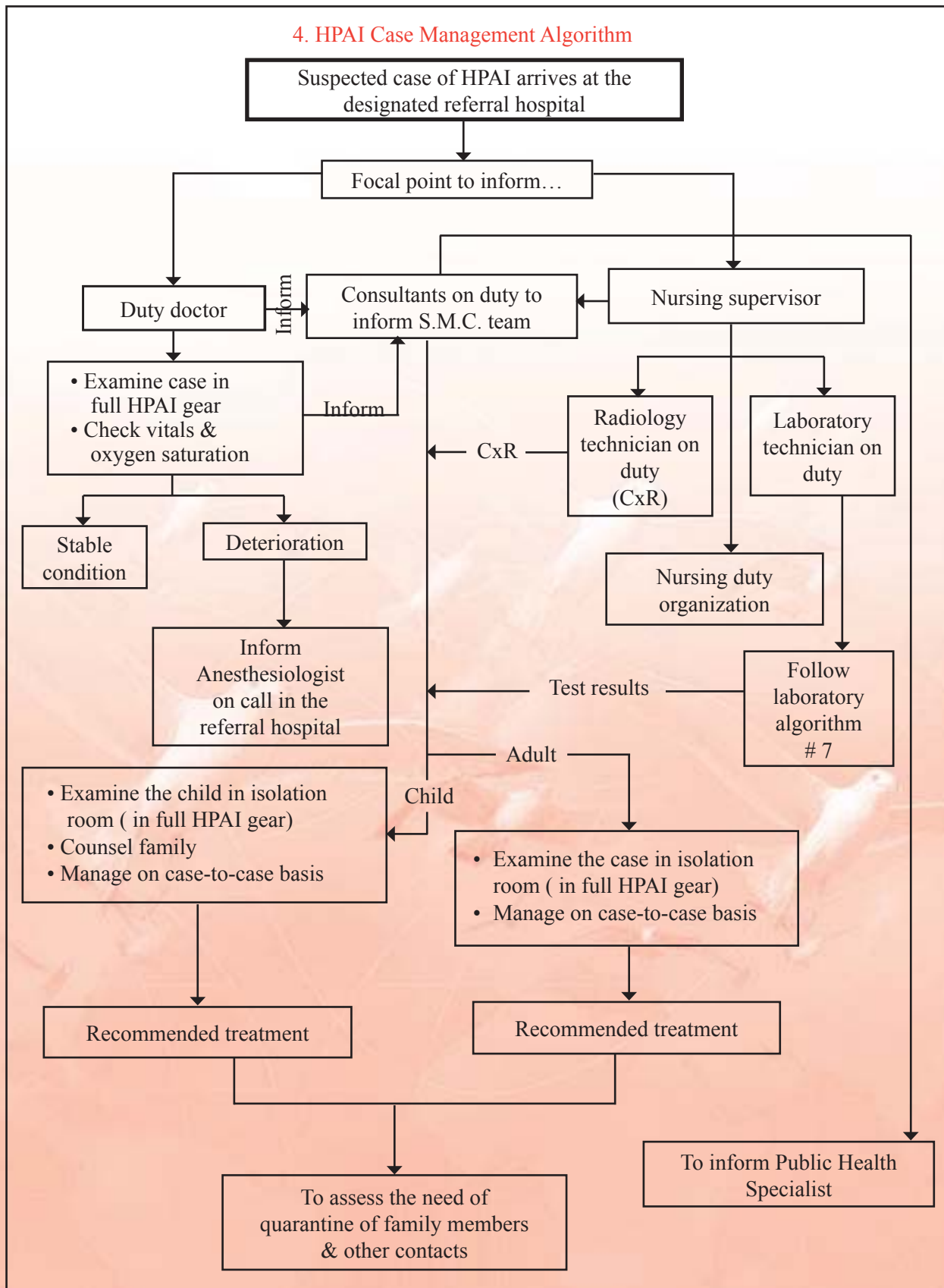
Lost to follow-up
• Date of loss ___ / ___ / ___

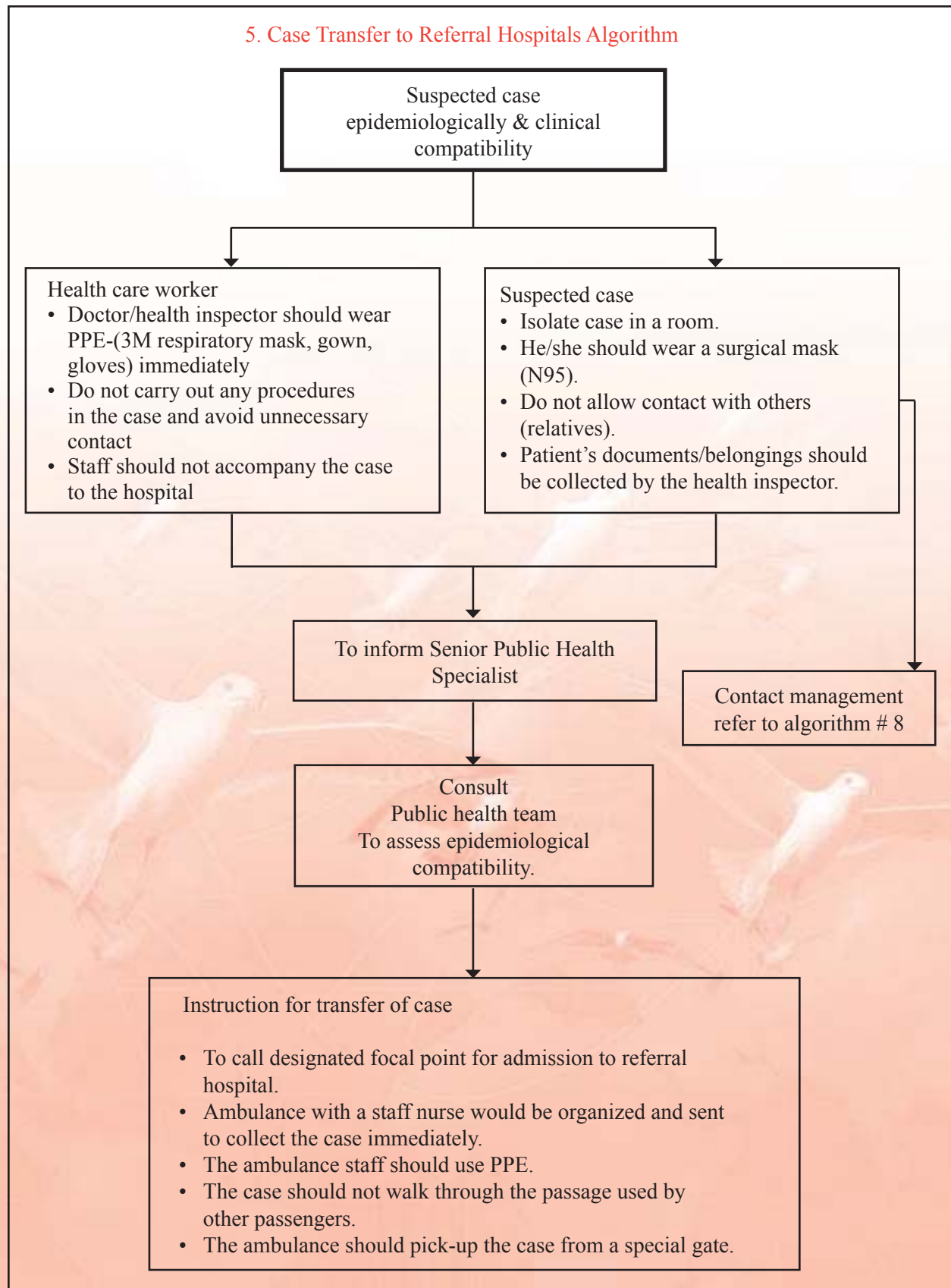
Name & Signature of reporting person: _____

Designation: _____

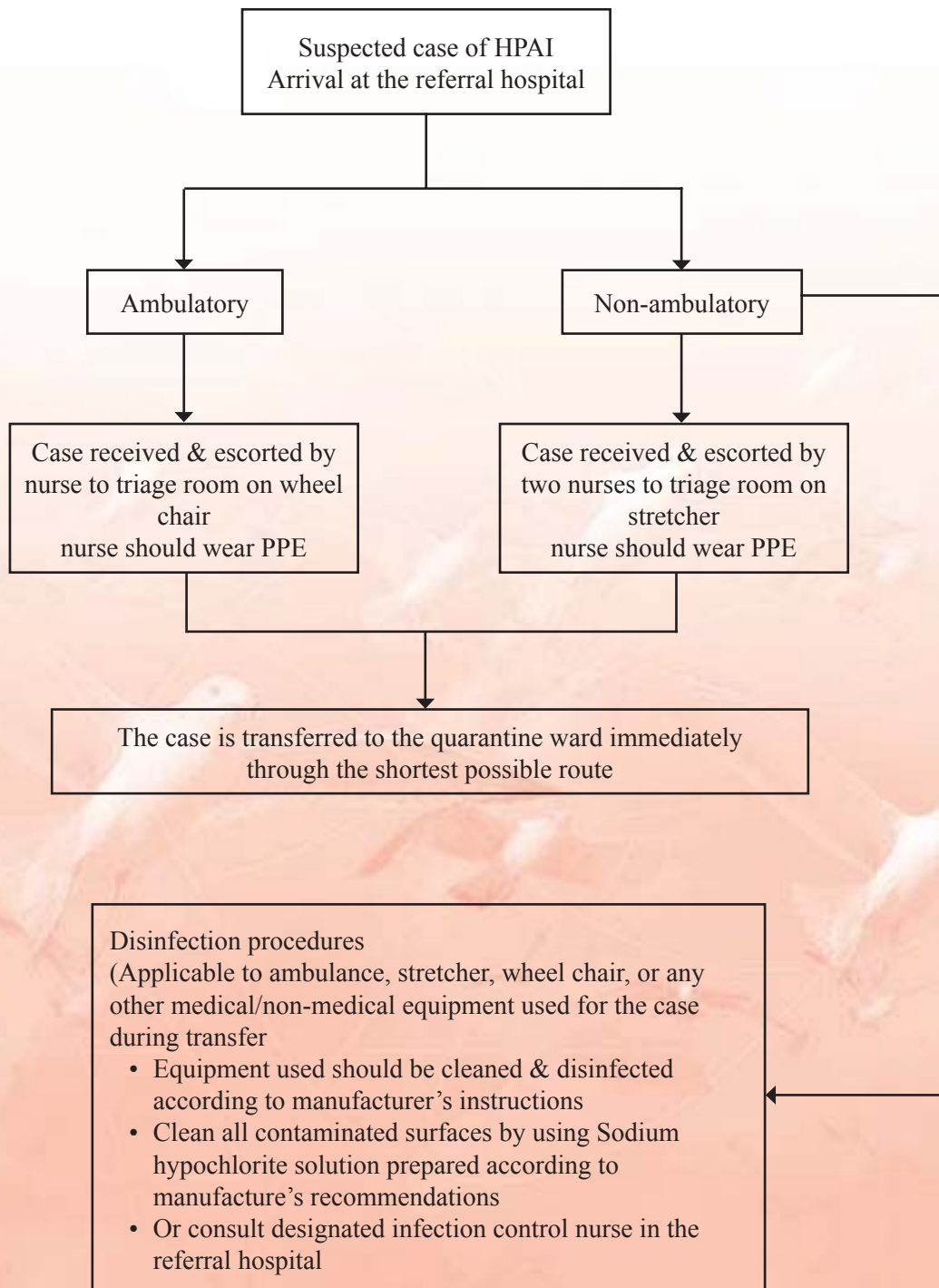
STAMP

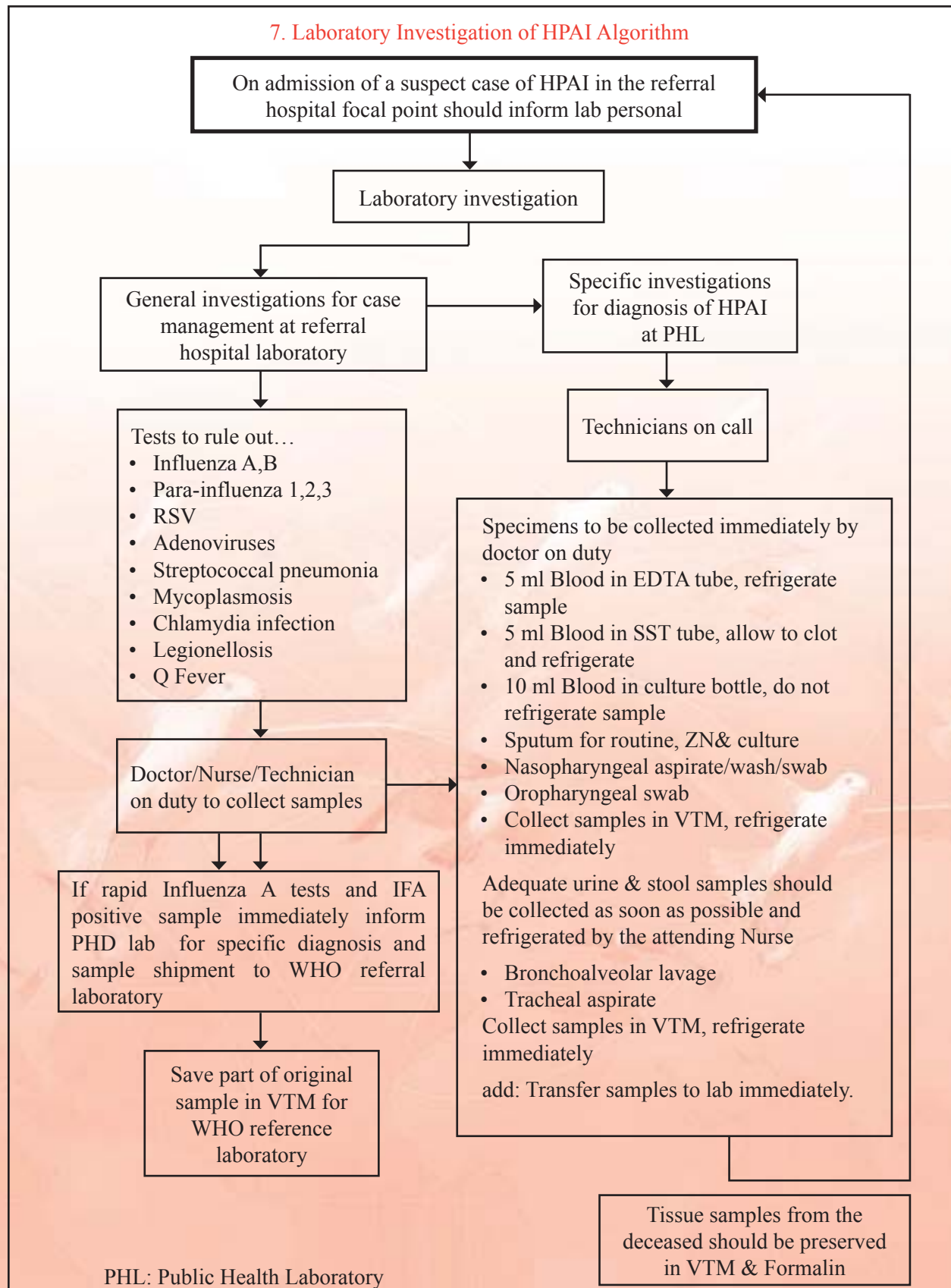


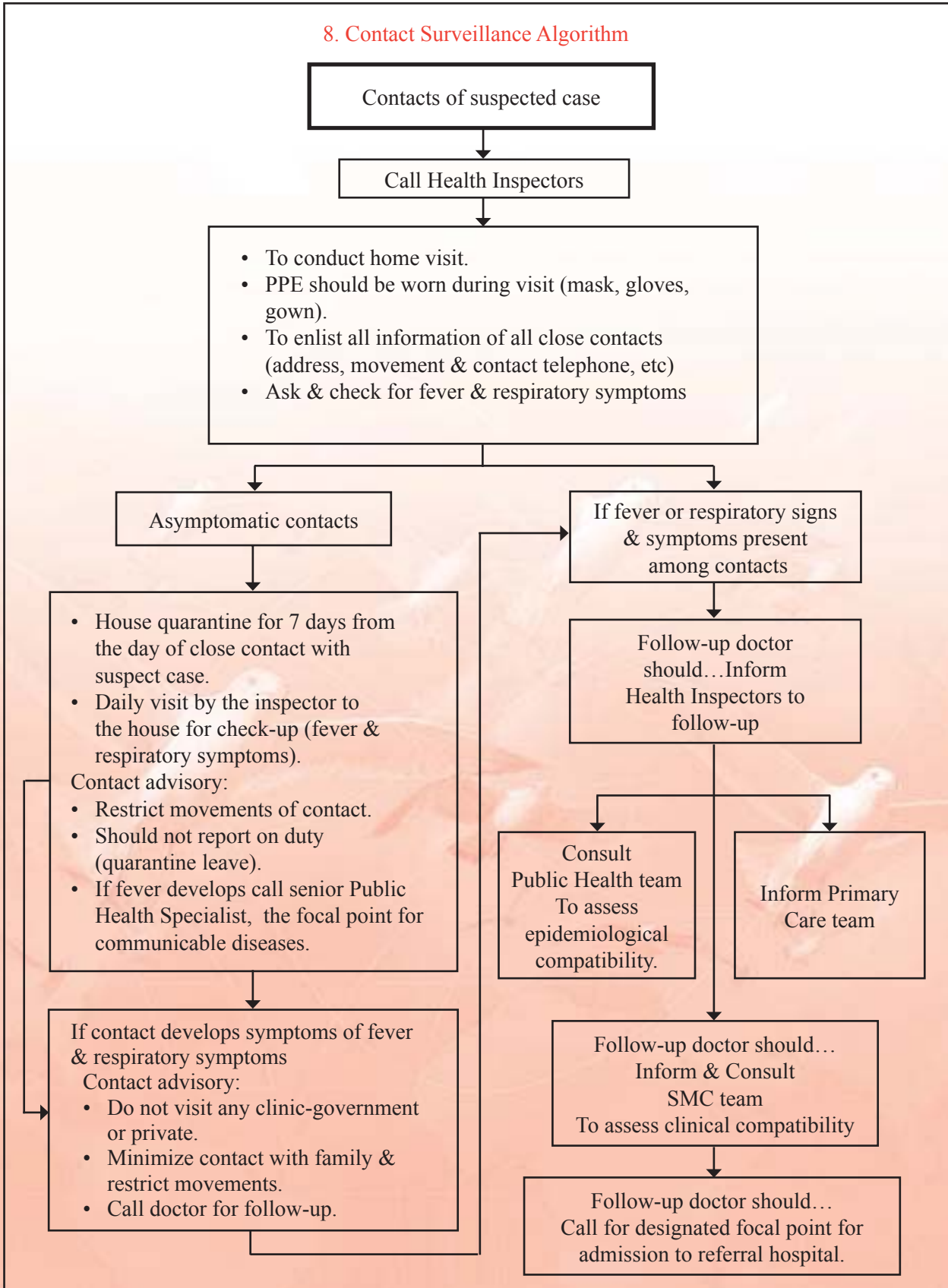


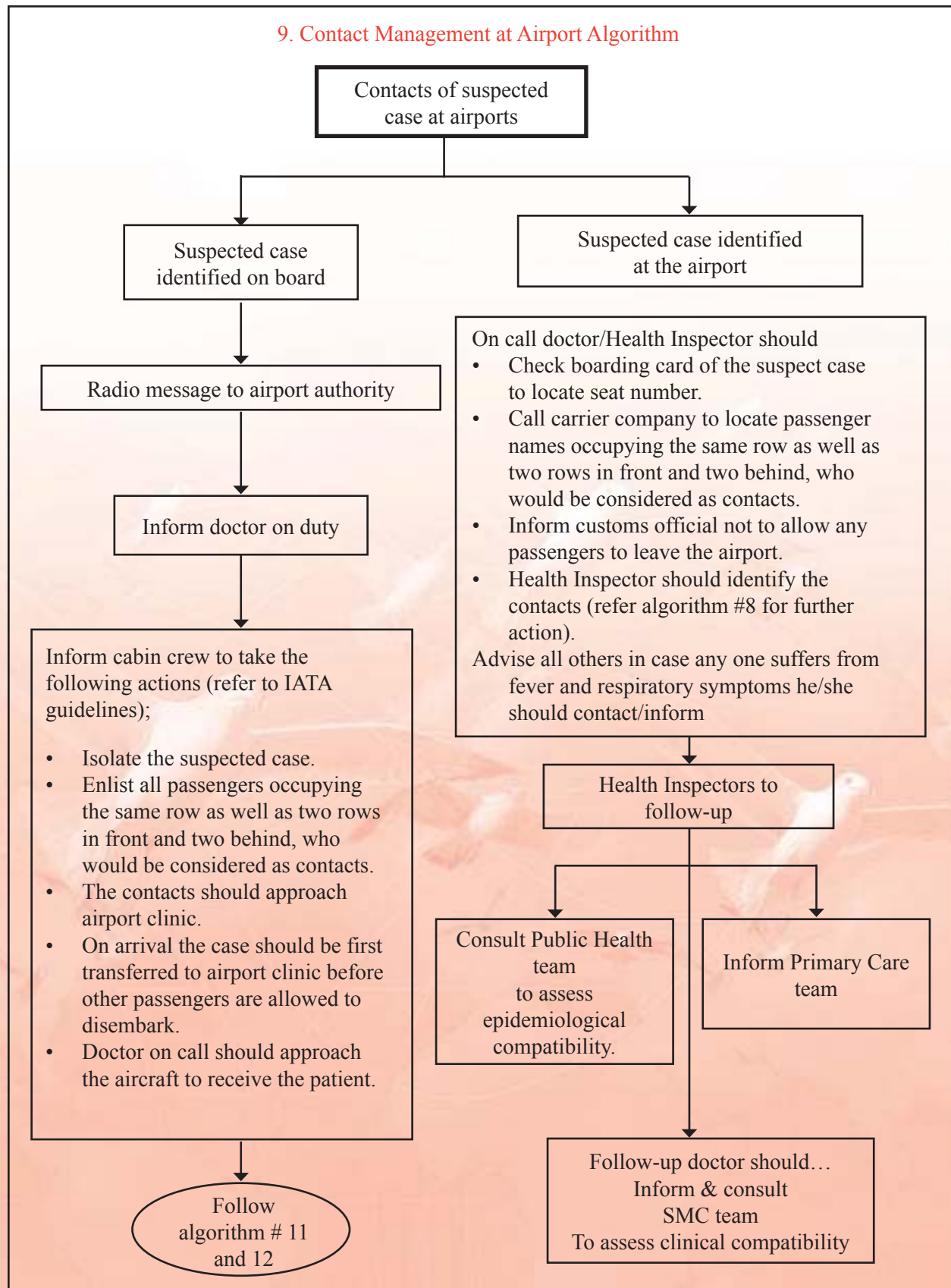


6. Case Arrival at Referral Hospital Algorithm

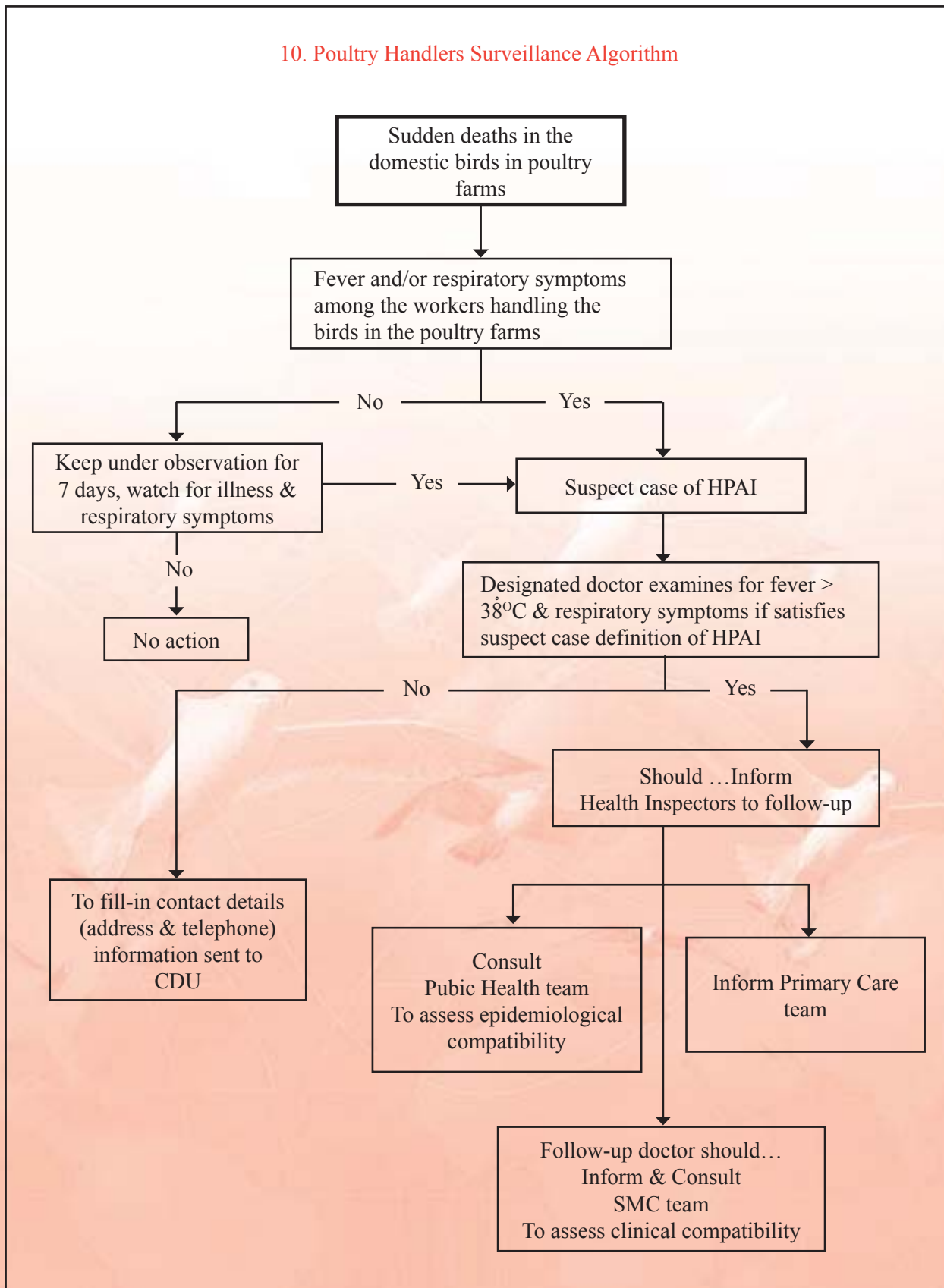








10. Poultry Handlers Surveillance Algorithm



11. Surveillance protocol Algorithm for ports

Port of entry: seaport, international airport and causeway has to inform ground staff by radio call if a suspected passenger or crew is onboard

Self declaration form to be filled by passengers arriving from affected countries within 7 days travel history.

Doctors at causeway and international airport will take travel history and clinical assessment. Specific actions required according to cases definition.

Doctor to take PPE and conduct:

1. Clinical assessment.
2. Temperature check.
3. Respiratory symptoms.
4. Fill- out data recording sheet.

Suspected/Probable /Confirm case with moderate to severe needs hospitalization with respiratory isolation precautions.

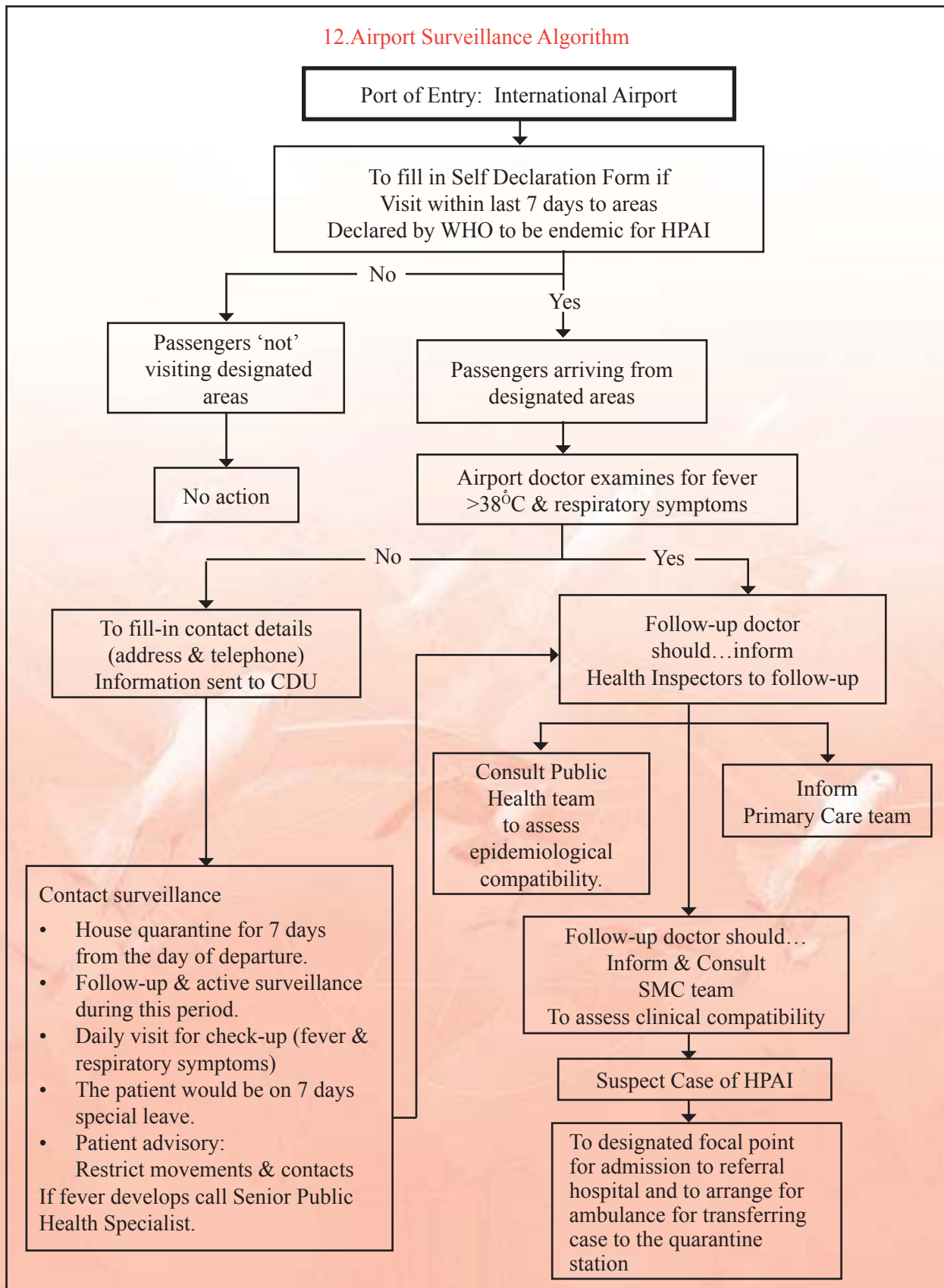
All these cases must be transported by EMS with PPE.
All these patients must be exempted from all medical charges
All health facilities and staff must adhere to infection control policies and practices.

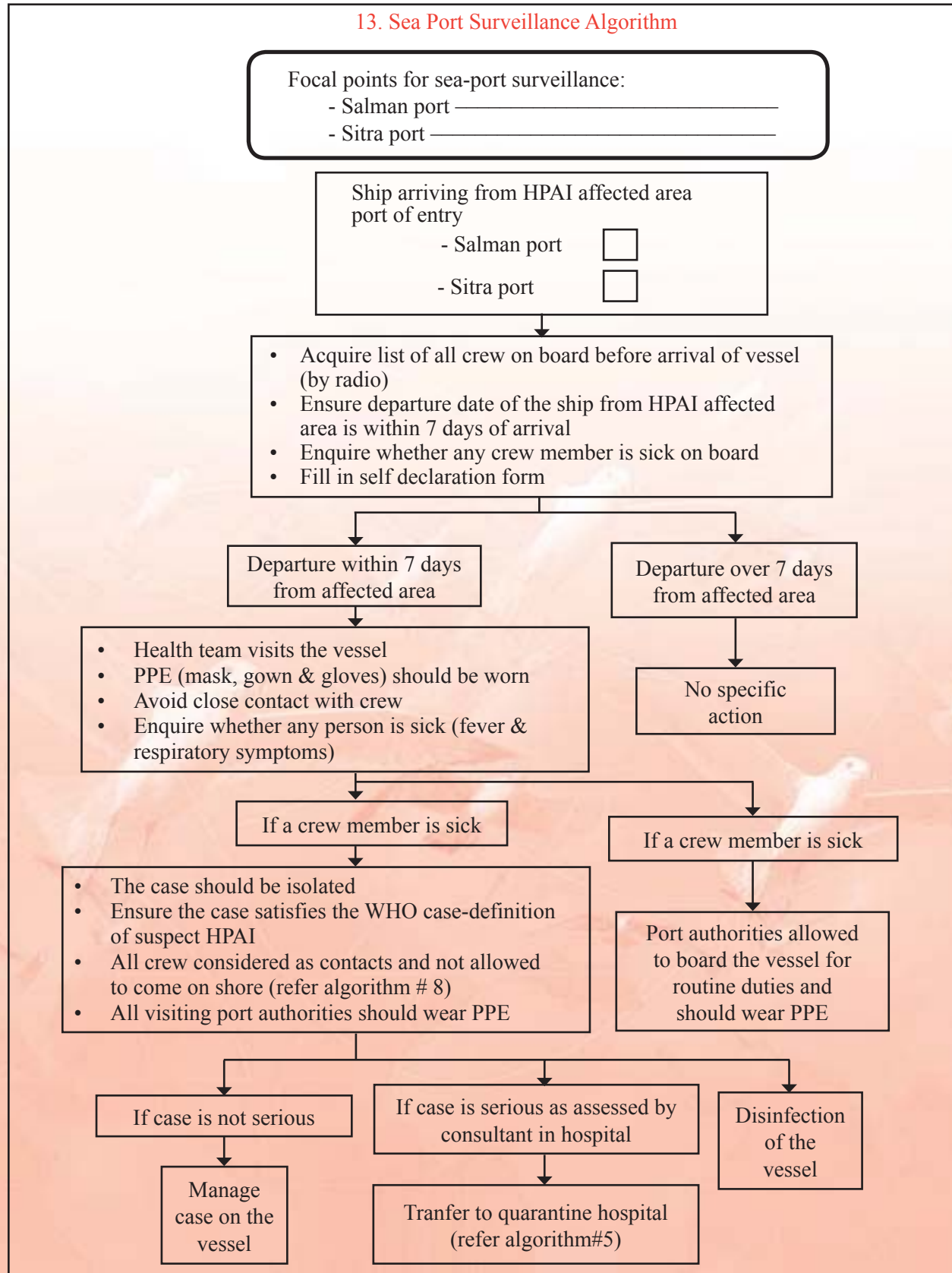
- No signs and symptom
- 1, Hand in "avian influenza" fact sheet.
 2. Self administered follow-up sheet for daily temperature monitoring.
 3. Clear instruction whom to contact if fever develops within 7 days of arrival from affected countries.

Suspected case with mild signs and symptoms
Actions required

1. Strict self isolation at home for 7 days with close fever (twice a day) and cough monitoring .
2. Antiviral treatment.
3. Clear instruction whom to contact if fever develops within 7 days of arrival.
4. Take PPE and go to designated lab for nasal specimen testing.
5. All contact will be contacted and given by CDU staff prophylactic treatment (Oseltamivir 75 mgs once daily for 5 days).
6. Doctor will immediately notify CDU by phone and fax.

No action required





14. Causeway Surveillance Algorithm

Focal points for causeway surveillance:
 -King Fahad _____
 Other _____

Car arriving from HPAI affected area

Enquire whether any one member is sick in the vehicle

Travel within 7 days from affected area

Travel over 7 days from affected area

- PPE (mask, gown & gloves) should be worn
- Avoid close contact with travellers
- Enquire whether any person is sick (fever & respiratory symptoms)

No specific action

If a traveller is sick

If no traveler is sick

- The case should be isolated
- Ensure the case satisfies the WHO case-definition of suspect HPAI
- All crew considered as contacts and not allowed to enter to Bahrain
- All visiting causeway authorities should wear PPE

Causeway authorities allowed them to enter and they should wear PPE

If case is serious as assessed by consultant in hospital

Disinfection of the vehicle

Transfer to quarantine hospital (refer algorithm # 5)

1 Q) What is influenza?

A) The influenza virus that circulates every year causes an infectious disease known as influenza (flu). Symptoms of the flu include: sudden fever, headache, muscle aches and pains, fatigue, cough, sore throat, stuffy or runny nose. The virus can cause a mild or severe illness depending on the type of influenza virus and the age and general health of the affected person. It may take 3-7 days to show symptoms.

2. Q) How to Prevent Influenza?

A) If you are from the high risk group (Doctors, Nurses, Laboratory technicians, chronic heart or lung disease, sickle cell disease, immunocompromised) ask your doctor to vaccinate you against the flu. As the influenza virus changes frequently, you will need to get vaccinated every year to maintain your immunity. The flu is very easily spread through coughs and sneezes. Good healthy hygienic habits can greatly reduce the chance that you will pass the flu on to others. If you have the flu, you should avoid public places and close contact with others, especially children. If you have the flu, you should always cough and sneeze into a disposable tissue and wash your hands afterwards.

3. Q) What is avian influenza?

A) Avian influenza, or “bird flu”, is a contagious disease of animals caused by viruses that normally infect only birds and, less commonly, pigs. While all bird species are thought to be susceptible to infection, domestic poultry flocks are especially vulnerable to infections that can rapidly reach epidemic proportions. The disease in birds has two forms. The first causes mild illness, sometimes expressed only as ruffled feathers or reduced egg production. Of greater concern is the second form, known as “highly pathogenic avian influenza”. This form, which was first recognized in Italy in 1878, is extremely contagious in birds and rapidly fatal, with a mortality approaching 100%. Birds can die on the same day that symptoms first appear.

4. Q) What are the symptoms of pandemic flu?

A) The symptoms of pandemic flu are the same as the seasonal flu virus. For example, sudden onset of high temperature, muscle aches and pains, tiredness, cough, sore throat and stuffy or runny nose.

5. Q) What about the symptoms of avian influenza How soon do symptoms start? How long does it last?

A) The exact symptoms, incubation period and duration of avian influenza in people is not known, because there have not been enough cases. The symptoms for people infected with the avian influenza virus are similar to those for people infected with human influenza virus, although the severity of the illness may differ. Symptoms generally appear three to seven days after exposure and can last up to seven days. People with avian influenza are infectious for at least seven (7) days (children are infectious for 21 days).

Annex 15 Frequently asked questions (contd.)

6. Q) Where and when an influenza pandemic might begin?

A) It is impossible to predict where and when an influenza pandemic might begin. The Bahrain Government is taking steps to prevent pandemic influenza from occurring in Bahrain. In the event of an influenza pandemic, good respiratory hygiene habits that reduce the spread of seasonal influenza will also reduce the spread of pandemic influenza. These are simple things you can do, like covering your mouth and nose when you cough or sneeze and washing your hands regularly.

7. Q) Is flu pandemic different from flu that occurs every year?

A) Yes. The seasonal outbreaks or 'epidemics' of flu that occur each year are caused by subtypes of influenza viruses that are already circulating among people. This means that there is already a level of immunity in the community. Because we know or can predict which viruses are circulating each year, we can also vaccinate high risk people for it. Pandemic flu is caused by an entirely new virus subtype. Because it is a new subtype, no-one in the community will have immunity to it. The pandemic can spread very quickly before a vaccine becomes available, affecting a greater number of people and likely causing greater sickness and death than a seasonal outbreak of flu.

8. Q) Who is at risk from pandemic flu?

A) A pandemic flu virus that emerges will be a new one that the entire population has no immunity to. Therefore, potentially all age groups will be at risk, but it is difficult to predict in advance who will be most severely affected. Previous pandemics have affected different age groups and have had varying death rates.

9. Q) Can pandemic flu kill people?

A) Yes, However, there are treatments available and ways to prevent infection from occurring in the first place. The health authorities have strategies in place to reduce the spread and impact of the pandemic in the population.

10. Q) Which viruses cause highly pathogenic disease?

A) Influenza A viruses have 16 H subtypes and 9 N subtypes. Only viruses of the H5 and H7 subtypes are known to cause the highly pathogenic form of the disease. However, not all viruses of the H5 and H7 subtypes are highly pathogenic and not all will cause severe disease in poultry. On present understanding, H5 and H7 viruses are introduced to poultry flocks in their low pathogenic form. When allowed to circulate in poultry populations, the viruses can mutate, usually within a few months, into the highly pathogenic form. This is why the presence of an H5 or H7 virus in poultry is always cause of concern, even when the initial signs of infection are mild.

11. Q) What is the present situation?

A) Since mid-December 2003, a growing number of Asian countries have reported outbreaks of highly pathogenic avian influenza in chickens and ducks. Infections in several species of wild birds and in pigs have also been reported. The rapid spread of highly pathogenic avian

Annex 15 Frequently asked questions (contd.)

influenza, with outbreaks occurring at the same time in several countries, is historically unprecedented and of great concern for human health as well as for agriculture. Particularly alarming, in terms of risks for human health, is the detection of a highly pathogenic strain, known as “H5N1”, as the cause of most of these outbreaks. H5N1 has jumped the species barrier, causing severe disease in humans.

12. Q) What is the current level of threat of a pandemic in the world?

- A) A close watch is being kept on the bird flu outbreaks. Bahrain determined that the threat level is Overseas 3. This means there are some human bird flu cases overseas but the infection is limited and doesn't appear to be readily passing from human to human. A pandemic would be declared if we reached Overseas 6-that is, when there is increased and sustained transmission of human bird flu in the general population.

13. Q) Why are Health Authorities worried about avian influenza?

- A) The World Health Organization is worried that an avian influenza virus and a human influenza virus might mix and result in a new strain of influenza virus that can be easily passed from person to person. This might trigger an “influenza pandemic”, where the disease spreads rapidly around the world, infecting many people.

14. Q) Do migratory birds considered source of Threat?

- A) Yes, because they can spread the disease from country to country and they can transmit the virus to domestic birds directly. FAO has alarmed that migratory birds are source of threat.

15. Q) Do migratory birds spread highly pathogenic avian influenza viruses?

- A) The role of migratory birds in the spread of highly pathogenic avian influenza is not fully understood. Wild waterfowl are considered the natural reservoir of all influenza A viruses. They have probably carried influenza viruses, with no apparent harm, for centuries. They are known to carry viruses of the H5 and H7 subtypes, but usually in the low pathogenic form. Considerable circumstantial evidence suggests that migratory birds can introduce low pathogenic H5 and H7 viruses to poultry flocks, which then mutate to the highly pathogenic form. In the past, highly pathogenic viruses have been isolated from migratory birds on very rare occasions involving a few birds, usually found dead within the flight range of a poultry outbreak. This finding long suggested that wild waterfowl are not agents for the onward transmission of these viruses. Recent events make it likely that some migratory birds are now directly spreading the H5N1 virus in its highly pathogenic form.

16. Q) What are the control measures in birds?

- A) The most important control measures are rapid destruction (“culling” or “stamping out”) of all infected or exposed birds, proper disposal of carcasses, and the quarantining and rigorous disinfection of farms. The virus is killed by heat (70 degrees) and common disinfectants,

Annex 15 Frequently asked questions (contd.)

such as formalin and iodine compounds. The virus can survive, at cool temperatures, in contaminated manure for at least three months. In water, the virus can survive for up to four days at 22 degrees C and more than 30 days at 0 degrees C. Restrictions on the movement of live poultry, both within and between countries, are another important control measure.

17. Q) What are the signs of disease in the infected birds?

A) Some or all of the following clinical signs are evident in infected birds:

- quietness and extreme depression.
- sudden drop in production of eggs, many of which are soft-shelled or shell-less.
- wattles and combs become swollen and congested.
- swelling of the skin under the eyes.
- coughing, sneezing and nervous signs.
- diarrhea.
- odema (swelling) and congestion of the combs.
- hemorrhages on the hock.
- a few deaths may occur over several days, but an outbreak may follow, killing hundreds or thousands of birds each day.

Diagnosis of avian influenza may be made on the basis of clinical signs and events leading to the disease. However, since the signs and course of avian influenza are similar to other diseases, laboratory diagnosis is essential.

18. Q) What are the consequences of outbreaks in poultry?

A) Outbreaks of avian influenza, especially the highly pathogenic form, can be devastating for the poultry industry and for farmers. Economic consequences can be especially devastating in developing countries where poultry raising is an important source of income – and of food – for impoverished rural farmers and their families. When outbreaks become widespread within a country, control can be extremely difficult. For these reasons, government authorities usually undertake aggressive emergency control measures as soon as an outbreak is detected.

19. Q) Does Avian influenza considered a human health concern?

A) Up to date Avian influenza considered a veterinary problem and it is not a human health concern and it will remain till the virus mutate and start to be transmitted from human to human.

20. Q) Can humans be infected and how common?

A) Yes, but this occurs rarely. First human cases were described in Hong Kong in 1997 during the large outbreak of avian influenza affecting the large live poultry markets. And Humans are usually infected through close contact with live infected birds.

21. Q) At present, is there evidence of efficient human-to-human transmission?

A) To date there is no evidence that the highly pathogenic avian influenza virus has adapted to spread easily in humans

Annex 15 Frequently asked questions (contd.)

22. Q) Is it reassuring that so few human cases have occurred?

- A) Yes. WHO has some evidence that the H5N1 strain may have been circulating in birds since April 2003. The detection so far of only a few human cases suggests that the virus may not be easily transmitted from birds to humans at present. However, the situation could change quickly, as the H5N1 strain has been shown to mutate rapidly and has a documented propensity to exchange genes with influenza viruses from other species.

23. Q) How do outbreaks of avian influenza spread within a country among birds and Humans?

- A) Within a country, the disease spreads easily from farm to farm. Large amounts of virus are secreted in bird droppings, contaminating dust and soil. Airborne virus can spread the disease from bird to bird, causing infection when the virus is inhaled. Contaminated equipment, vehicles, feed, cages or clothing – especially shoes – can carry the virus from farm to farm. The virus can also be carried on the feet and bodies of animals, such as rodents, which act as “mechanical vectors” for spreading the disease. Limited evidence suggests that flies can also act as mechanical vectors. Droppings from infected wild birds can introduce the virus into both commercial and backyard poultry flocks. The risk that infection will be transmitted from wild birds to domestic poultry is greatest where domestic birds roam freely, share a water supply with wild birds, or use a water supply that might become contaminated by droppings from infected wild-bird carriers. So called “wet” markets, where live birds are sold under crowded and sometimes unsanitary conditions, can be another source of spread.

24. Q) How does the disease spread from one country to another?

- A) The disease can spread from country to country through international trade in live poultry. Migratory birds, including wild waterfowl, sea birds, and shore birds, can carry the virus for long distances and have, in the past, been implicated in the international spread of highly pathogenic avian influenza. Migratory waterfowl – most notably wild ducks – are the natural reservoir of bird flu viruses, and these birds are also the most resistant to infection. They can carry the virus over great distances, and excrete it in their droppings, yet develop only mild and short-lived illness. Domestic ducks, however, are susceptible to lethal infections, as are turkeys, geese, and several other species raised on commercial or backyard farms.

25. Q) Which influenza considered the most serious?

- A) Influenza pandemic occurs rarely but does occur when a new virus (H5N1) in which no body

Name	Year	No. of deaths
Spanish Pandemic	1918	40-50 million
Asian Pandemic	1957	2 million
Hong Kong pandemic	1968	1 million

Annex 15 Frequently asked questions (contd.)

26. Q) Is avian flu considered a global Threat?

A) Yes, all countries are at risk.

27. Q) Why we should differentiate between the needed concern and the unnecessary fear?

A) We should differentiate between the needed concern and the unnecessary fear as the human seasonal influenza death reaches 750,000 deaths per year globally and most of them elderly and high risk groups e.g. Diabetics, Asthmatics and heart diseases patients. Estimated annual human deaths:

Disease	No of Cases	No of Deaths
Human influenza	200 million	500 thousand million
SARS	8400	800
Avian flue	1997(18)	6

28. Q) What about the pandemic risk?

A) A pandemic can start when three conditions have been met: a new influenza virus subtype emerges; it infects humans, causing serious illness; and it spreads easily and sustainably among humans. The H5N1 virus simply meets the first two conditions: it is a new virus for humans (H5N1 viruses have never circulated widely among people), and it has infected humans, killing over half of them. No one will have immunity should an H5N1-like pandemic virus emerge. All prerequisites for the start of a pandemic have therefore been met except one: the establishment of efficient and sustained human-to-human transmission of the virus. The risk that the H5N1 virus will acquire this ability will persist as long as opportunities for human infections occur. These opportunities, in turn, will persist as long as the virus continues to circulate in birds, and this situation could endure for some years to come.

29. Q) What changes are needed for H5N1 to become a pandemic virus?

A) The virus can improve its transmissibility among humans via two principal mechanisms. The first is a “reassortment” event, in which genetic material is exchanged between human and avian viruses during co-infection of a human or pig. Reassortment could result in a fully transmissible pandemic virus, announced by a sudden surge of cases with explosive spread. The second mechanism is a more gradual process of adaptive mutation, whereby the capability of the virus to bind to human cells increases during subsequent infections of humans. Adaptive mutation, expressed initially as small clusters of human cases with some evidence of human-to-human transmission, would probably give the world some time to take defensive action.

30. Q) Are there any other causes for concern?

A) Yes.

- Domestic ducks can now excrete large quantities of highly pathogenic virus without showing signs of illness, and are now acting as a “silent” reservoir of the virus,

perpetuating transmission to other birds. This adds yet another layer of complexity to control efforts and removes the warning signal for humans to avoid risky behaviours.

- When compared with H5N1 viruses from 1997 and early 2004, H5N1 viruses now circulating are more lethal to experimentally infected mice and to ferrets (a mammalian model) and survive longer in the environment.
- H5N1 appears to have expanded its host range, infecting and killing mammalian species previously considered resistant to infection with avian influenza viruses.
- The behaviour of the virus in its natural reservoir, wild waterfowl, may be changing. The spring 2005 die-off of upwards of 6,000 migratory birds at a nature reserve in central China, caused by highly pathogenic H5N1, was highly unusual and probably unprecedented. In the past, only two large die-offs in migratory birds, caused by highly pathogenic viruses, are known to have occurred: in South Africa in 1961 (H5N3) and in Hong Kong in the winter of 2002–2003 (H5N1).

31 Q) Are the right control measures being applied?

- A) In some cases, yes. countries appear to have controlled their outbreaks in poultry, quickly and safely. Studies of workers involved in culling operations have been conducted, and no cases of human infection have been detected. The situation in other countries is more problematic. WHO is fully aware that governments in several countries with serious poultry outbreaks do not have the resources needed to introduce recommended protective measures for cullers or carry out the very rapid destruction of poultry flocks. In some of these countries, the practice of raising poultry on backyard farms in remote rural areas, which may not be registered with agricultural authorities, further complicates rapid and systematic elimination of the animal reservoir.

32. Q) What measures are in place to prevent avian influenza in Bahrain?

- A) Bahrain Government has many measures in place to prevent the emergence of avian influenza in Bahrain. Because the avian influenza virus has not been shown to definitely spread from person to person, it is very unlikely that anyone entering Bahrain with the disease will pass it on. But people who have arrived from overseas or travelled to countries where there are reports of avian influenza in birds or people should monitor their health carefully for seven (7) days (for other severe respiratory diseases this period of monitoring may be longer). They should immediately contact a doctor if they feel unwell with fever or flu-like symptoms and they should inform the doctor about their travels.

33. Q) Is Bahrain disease free?

- A) Bahrain is free from avian influenza. No documented cases between humans, it is reassuring that Bahrain is free from avian flu, but an effort should be stressed to monitor the situation in order to prevent the emergence of the virus to Bahrain.

34. Q) Can a pandemic be averted?

- A) No one knows for sure. Influenza viruses are highly unstable and their behaviour defies prediction. However, WHO remains optimistic that, if the right actions are taken quickly, an influenza pandemic can be averted. This is WHO's foremost objective at present. The first

priority, and the major line of defence, is to reduce opportunities for human exposure to the largest reservoir of the virus: infected poultry. This is achieved through the rapid detection of poultry outbreaks and the emergency introduction of control measures, including the destruction of all infected or exposed poultry stock, and the proper disposal of carcasses. All available evidence points to an increased risk of transmission to humans when outbreaks of highly pathogenic avian H5N1 influenza are widespread in poultry. As the number of human infections grows, the risk increases that a new virus subtype could emerge, triggering an influenza pandemic. WHO stresses the urgency of the situation and the need for rapid action in the animal and agricultural sectors. For example, the culling in 1997 of Hong Kong's entire bird population – an estimated 1.5 million chickens and other birds – was done in 3 days. Again in 2003, the culling of nearly 30 million birds (out of a total bird population of 100 million) in the Netherlands was done within a week. Rapid action in both of these situations is thought by many influenza experts to have averted an influenza pandemic.

35. Q) What is the predicted number of deaths from the pandemic virus?

- A) The severity of disease and the number of deaths caused by a pandemic virus vary greatly, and cannot be known prior to the emergence of the virus. During past pandemics, attack rates reached 25-35% of the total population. Under the best circumstances, assuming that the new virus causes mild disease, the world could still experience an estimated 2 million to 7.4 million deaths (projected from data obtained during the 1957 pandemic). Projections for a more virulent virus are much higher. The 1918 pandemic, which was exceptional, killed at least 40 million people.

36. Q) What are the most important warning signals that a pandemic is about to start?

- A) The most important warning signal comes when clusters of patients with clinical symptoms of influenza, closely related in time and place, are detected, as this suggests human-to-human transmission is taking place. For similar reasons, the detection of cases in health workers caring for H5N1 patients would suggest human-to-human transmission. Detection of such events should be followed by immediate field investigation of every possible case to confirm the diagnosis, identify the source, and determine whether human-to-human transmission is occurring. Studies of viruses, conducted by specialized WHO reference laboratories, can corroborate field investigations by spotting genetic and other changes in the virus indicative of an improved ability to infect humans. This is why WHO repeatedly asks affected countries to share viruses with the international research community.

37. Q) Where have human cases occurred first?

- A) In the current outbreak, laboratory-confirmed human cases have been reported in some Asian countries. Hong Kong has experienced two outbreaks in the past. In 1997, in the first recorded instance of human infection with H5N1, the virus infected 18 people and killed 6 of them. In early 2003, the virus caused two infections, with one death, in a Hong Kong family with a recent travel history to southern China.

Annex 15 Frequently asked questions (contd.)

38. Q) Apart from H5N1, have other avian influenza viruses ever infected humans?

A) Yes. but the outbreaks were not as severe as those caused by the H5N1 strain.

39. Q) How do people become infected from birds?

A) Direct contact with infected poultry, or surfaces and objects contaminated by their faeces, is presently considered the main route of human infection. To date, most human cases have occurred in rural or periurban areas where many households keep small poultry flocks, which often roam freely, sometimes entering homes or sharing outdoor areas where children play. As infected birds shed large quantities of virus in their faeces, opportunities for exposure to infected droppings or to environments contaminated by the virus are abundant under such conditions. Moreover, because many households in Asia depend on poultry for income and food, many families sell or slaughter and consume birds when signs of illness appear in a flock, and this practice has proved difficult to change. Exposure is considered most likely during slaughter, defeathering, butchering, and preparation of poultry for cooking.

40. Q) How does pandemic flu spread from human to human?

A) Pandemics of flu are spread from person to person by respiratory secretions in three ways:

- Through spread of droplets from one person to another (eg coughing, sneezing).
- By touching things that are contaminated by respiratory secretions and then touching mouth, eye or nose.
- Through spread of particles in the air in crowded populations in enclosed spaces.

41. Q) Can Avian influenza transmitted through eating food?

A) To date, no evidence indicate that any case become infected following consumption of properly cooked poultry or poultry products, so we advice proper cooking of food at (70°C).

42. Q) How is pandemic flu treated?

A) The mainstays of treatment include rest, ensuring adequate fluid intake and nutrition and taking medications to help lower fever and pain such as aspirin (but not in children) and paracetamol. Complications, such as bacterial pneumonia, can develop in some people and can be treated with antibiotics. Those who are severely affected. Antiviral medication should be started within 48 hours after symptoms onset.

43. Q) Is there a vaccine effective against H5N1 in humans?

A) No. Currently available vaccines will not protect against the disease caused by the H5N1 strain in humans. WHO is urgently working together with laboratories in the WHO Global Influenza Surveillance Network to develop a prototype H5N1 virus for use by leading vaccine manufacturers.

Annex 15 Frequently asked questions (contd.)

44. Q) What about vaccines during a flu pandemic?

- A) The seasonal flu vaccine will not protect against pandemic flu. However, it will still be important to vaccinate high risk groups against any seasonal strains of flu which are currently circulating.

45. Q) What drugs are available for treatment?

- A) Oseltamivir can reduce the severity and duration of illness caused by seasonal influenza. The efficacy of the neuraminidase inhibitors depends on their administration within 48 hours after symptoms onset. For cases of human infection with H5N1, the drugs may improve prospects of survival, if administered early.

46. Q) How can I protect myself and others from pandemic flu?

- A) Apart from the influenza antivirals, there are many measures that individuals can take to protect themselves and others from all respiratory diseases, including pandemic flu. For example:
- General hygiene measures such as regular handwashing.
 - Cough hygiene (turning away from other people and covering the mouth with tissues when coughing or sneezing, disposing of the tissues afterwards and washing hands after disposal of the tissues).
 - When unwell, avoiding public places and contact with children or people with underlying illnesses.
 - When attending a medical practice, alerting the receptionist to your symptoms so you can be seated away from others and possibly be given a surgical mask.
 - Maintaining good general health and staying up-to date with the recommended vaccinations, such as the seasonal flu vaccine for those in high risk groups.
 - Avoid unnecessary travel to affected country.
 - Proper cooking of chicken and eggs (more than 70°C)
 - Avoid unnecessary contact with live poultry specially in the affected countries (theses need special precaution e.g. mask, goggles, gloves when dealing with disease poultry .
 - All Bahrainis are requested to cooperate and follow the laws and legislation against hunting wild birds in order to protect our country.

47. Q) How to protect our self during travel?

- A) • Avoid unnecessary contact with live poultry such as poultry farms/markets.
- Avoid contact with respiratory cases and cover face and nose during sneezing.
 - Wash your hands frequently.
 - Cook poultry and poultry products in a temperature more than 70°C
 - Avoid under cooked food and food in which raw eggs used in preparation e.g. mayonnaise and ice cream. Proper handling of eggs as it can contain the virus from the inside and out side (shell).
 - Watch your children.

Annex 15 Frequently asked questions (contd.)

48. Q) Is pandemic flu a quarantinable disease?

- A) Yes. Highly pathogenic avian influenza affecting humans was made a quarantinable disease on 23rd March 2004.

49. Q) If I get pandemic flu will I be put in quarantine?

- A) Depending upon the severity of disease, people who have symptoms of pandemic flu will be advised to stay at home or will be cared for in hospital (in isolation from other patients without pandemic flu.) Depending on the timing and severity of the pandemic outbreaks, quarantining of contacts (ie family or friends) of pandemic influenza patients may occur, usually in the home. Quarantine or isolation measures may be used to help stop pandemic flu coming into Bahrain as well as keeping it contained in the event the pandemic has arrived in this country.

50. Q) How long would people be quarantined for?

- A) Based on the current bird flu strains, adult individuals may be quarantined for 7 days and children for 21 days, this will need to be reviewed according to the characteristics of the pandemic virus itself.

51. Q) How well prepared Bahrain for pandemic influenza?

- A) • Bahrain is comparatively well prepared to respond to a flu pandemic. Quarantine officer are maintaining a high level of alert for poultry and poultry products from bird flu affected countries. Bahrain has stockpile of drugs and equipment needed in a pandemic-such as antiviral agents, personal protective equipment, negative pressure units needed to isolate hospital rooms to prevent flue spread and thermal scanners to screen people with signs of flu at the borders. Other measures include enhancing the national infectious diseases surveillance system, improving laboratory capacity.
- Bahrain follows WHO guidelines and strategy to face the pandemic threat.
 - A supreme committee to prevent avian influenza was raised by his highest the priminister. from which a working groups from all concerned ministries are working on a national plan.
 - Disease Control Section prepared a health contingency plan.
 - Health committee prepared an implementing plans.
 - Annual flu vaccination for poultry workers and health care workers is given.
 - A lot of media release.
 - A training and educational materials were issued for health care workers and the public.

52. Q) What are the good news?

- A) • WHO, FAO and OIE preparedness plan
- Preparedness plan in most countries effort to face this event.
 - The allocation of budget for Diseases Control contingency plan.
 - Presence of drugs (oseltamivir) for Avian influenza treatment.
 - The process for vaccine manufacturing and advance contract with the countries.

53. Q) What are the important updated messages?

- A) • Up to date no human to human transmission, but rarely people infected due to direct contact with the diseased poultry.
- Up to date it is still veterinary problem, it will be human threat only when the virus mutate and changes its genetics.
 - There is no special advice against eating chicken or traveling to affected country.
 - Cook chicken and eggs in temperature more than 70°C kills the virus.
 - Don't reserve oseltamivir or other medication and don't take any drug without doctor advice.

54. Q) Do you need more information?

- A) Ministry of Health web site: www.health.gov.bh or call Health Education Hotline (17279610) or Agriculture Hotline (17693900) or Diseases Control Section website www.ai.moh.gov.bh

Summary

- When human to human transmission of avian influenza occurs, Bahrain travellers, long-term residents and businesses overseas should inform themselves about the risks of avian influenza, be prepared to take personal responsibility for their own safety and put appropriate contingency plans in place.
- Bahrainis who live in an avian influenza affected area for an extended period should consider, as a precautionary measure, having access to influenza antiviral medicine for treatment.
- Bahrainis intending to travel to affected countries for shorter periods are at much lower risk of infection but should discuss the risk of avian influenza with their doctor as part of their routine pre-travel health checks.
- If the threat of sustained human-to-human transmission appears serious, we will advise Bahrainis in affected countries to consider leaving. If they don't leave when first advised to do so, they may be prevented from leaving later.
- In case they need to depart an affected country at short notice, Bahrainis should ensure that their travel documents are up to date.

Advice for Bahrainis

The Public Health advises Bahrainis who reside in an avian influenza affected area for an extended period to consider, as a precautionary measure, having access to influenza antiviral medicine for treatment. Long term residents are at a greater risk of exposure to avian influenza over time. Medical advice should be sought before antiviral medicines are commenced.

The Public Health advises that Bahrainis intending to travel to avian influenza affected areas for shorter periods although they are at much lower risk of infection but should discuss the risk of avian influenza with their doctor as part of their routine pre-travel health checks.

Currently there is only a limited availability of influenza antiviral medicines in many countries. Bahrainis should familiarise themselves with the advice regarding personal protective and infection-control measures.

Individual Bahrainis and Bahrain businesses overseas are responsible for securing their own supply of influenza antiviral medicine (oseltamivir). Bahrain missions and offices overseas will not be in a position to provide influenza antiviral medicines to Bahrainis in affected areas.

Bahrainis should be aware that the delivery of consular assistance to Bahrainis if an outbreak occurs could be severely constrained by local health conditions and restrictions on travel. Bahrain travellers, long term residents and businesses overseas should be prepared in these circumstances to take personal responsibility for their own safety and well-being, and should monitor this Bulletin and the relevant country travel advice for updated information and advice.

If the threat of sustained human-to-human transmission appears serious, we will advise Bahrainis in affected countries to consider leaving, and Bahrainis planning travel to affected countries to reconsider their need to travel. At the same time the Bahrain Government would likely direct its staff in those countries who are not providing emergency services, and all dependants of staff, to depart. As a precautionary measure in case they need to depart at short notice, Bahrainis should ensure that their travel documents are up to date, including passports and visas for any non-Bahrainis family

Annex 16 Avian flu traveller's bulletin (contd.)

members. Bahrainis who return to Bahrain from any areas affected by human-to-human transmission may be subject to quarantine measures at Bahrain borders.

If the virus mutates to a form where efficient human-to-human transmission occurs, it may spread quickly and local authorities could move quickly to impose restrictions on travel. Bahrainis who don't leave affected countries when first advised to do so may be prevented from leaving later. Borders may be closed, commercial air services may be curtailed or halted and quarantine requirements may further restrict options for leaving. Bahrainis therefore need to consider in advance how they can care for themselves and put appropriate contingency plans in place. Reducing the risk of infection

People are at risk of contracting avian influenza if they have close contact with infected birds. The virus does not spread easily from birds to people. There is a very low risk of contracting the disease from occasional contact with an infected bird such as when travelling on public transport.

Bahrainis travelling to areas affected by avian influenza can reduce their risk of infection by:

- avoiding situations where they may come into contact with farms and live bird markets, and
- ensuring all uncooked poultry and eggs are handled hygienically, with careful attention to hand washing after handling, and then cooked thoroughly. Proper cooking destroys the virus in poultry and eggs.

Avian influenza among birds

Since December 2004 outbreaks amongst birds, including chickens and ducks, have been reported. The WHO is working to support national disease authorities in the affected countries to investigate the outbreaks. The WHO has not advised against travel to any of the affected countries.

Further information

Information about how the virus spreads from birds to humans, including frequently asked questions about avian influenza, is available from the Ministry of Health, Disease Control Section website www.ai.moh.gov.bh

To be filled out by all incoming passengers and crews in the event of respiratory outbreak

You must provide as much information as possible in section A and B.

A. Contact details in Bahrain during the next 7 days or the name of your hotel and area.

Address: Hotel _____
House _____, Road _____,
Block _____

Phone Number

--	--	--	--	--	--	--	--	--	--

Mobile Phone No.

--	--	--	--	--	--	--	--	--	--

Email Address _____

B. Details of a contact person in (Bahrain or overseas) who will know how to contact you in the next 7 days

Address: Hotel _____
House _____, Road _____,
Block _____

Phone Number

--	--	--	--	--	--	--	--	--	--

Mobile Phone No.

--	--	--	--	--	--	--	--	--	--

Email _____

Address _____

Ministry of Health
Public Health Directorate

Health Declaration Card

Passenger/crew

Please tear off the passenger/crew Health Information section and present it to a customs officer on arrival in Bahrain

HEALTH ALERT NOTICE for international travelers arriving in Bahrain. Please keep this brochure for 14 days after arrival.

TO THE TRAVELLER:

After any international travel we urge you to monitor your health. There is a small chance that during your travels you could have been exposed to infectious diseases such as Avian influenza, Severe Acute Respiratory Syndrome (SARS), gastroenteritis or malaria. It is very important that if you become unwell in the weeks following your travel that you and your doctor consider your recent destinations as a possible source for your illness.

In particular, if you become ill with fever, chills, cough, shortness of breath, sore throat, headache or muscle aches and pains in the next two weeks, contact a doctor or hospital immediately and tell them about your symptoms and recent travel. Wear a mask when attending the facility and provide this information sheet to the doctor. Wearing a mask will minimize the spread of your infection to others.

If you are a health care worker you need to be especially careful about working if you have any symptoms of illness in the period after travel. If you become unwell in the next two weeks contact your employer or local public health unit for advice before attending work.

TO THE DOCTOR:

The patient presenting this information sheet may have acquired an infection in another country. If, on the basis of clinical signs and symptoms, and travel history, you suspect that this patient has a serious infection acquired overseas, please contact Communicable Disease Unit on 17279214/If required more information it is available at Avian Flu website www.ai.moh.gov.bh

Passenger/Crew Avian Influenza Health Information

Flight number/	<input type="text"/>
Arrival date	<input type="text"/> / <input type="text"/> / <input type="text"/>
Seat Number	<input type="text"/>
Alternative seat number if moved	<input type="text"/>
Family name	<input type="text"/>
Given names	<input type="text"/>
Passport number	<input type="text"/>

Q1. Do you have fever, chills, cough, shortness of breath, sore throat, headache or muscle aches and pains?

(Please × one only) Yes No

If YES, please inform the cabin crew.

Q2. In the last 7 days have you had contact with someone who had a severe respiratory illness?

(Please × one only) Yes No

If YES, please inform the cabin crew.

Providing false or misleading information is an offence.

Passenger's signature

Annex 18 Animal Health Frequently Asked Questions

1. Q) Is it safe for children to pick up feathers?

A) The probability of humans being infected with avian influenza directly from birds is still extremely low, and individual feathers would be an even more remote source of infection. Children should not pick up or handle dead birds. If they have come in contact in an area where avian influenza is not present, proper hand washing is still prudent.

2. Q) Is it safe to hunt?

A) If hunters are hunting in areas where avian influenza is currently infecting wild birds, they need to be exceptionally careful about good hygiene.

3. Q) Should dead birds be reported (not on farms)?

A) Yes, all dead birds should be reported to authorities at Ministry of Agriculture and Municipality at this point in time. Local authorities will determine next steps.

4. Q) Is it safe to handle/eat eggs?

A) Yes, once again, proper hygiene such as hand washing is always warranted.

5. Q) Should people get flu shots?

A) That is a personal decision everyone must make every year. The guidance of human health authorities should be followed now and in the future as different vaccines become available.

6. Q) What is the origin of the avian influenza crisis in Asia?

A) The origins is uncertain but from what is known of the general biology of the infection, and risk factors for its entry and spread, some areas stand out for further analysis. The presence of multiple virus types of high severity for poultry point at a supportive environment for disease agents to move in the poultry sector. Domestic poultry increasingly forms the basis for entry, spread and shift to high severity (virulence) of influenza viruses which in the past were mostly mild infections and confined to waterfowl. The dramatic growth in domestic poultry production is part of the explanation.

7. Q) What should be done when an outbreak occurs?

A) The general approach to be selected and the combination of actions to be taken with regard to controlling marketing, imposition of movement restrictions, quarantine measures, culling, and any vaccination, varies according to the local set of circumstances and from country to country. There is no single solution applicable to all scenarios, and a balance must always be found to find effective, feasible and socially acceptable control measures that safeguard the short and long term livelihoods of farmers and the health of the population. It remains, however, that in the face of an emergency with multiple outbreaks suggesting Highly Pathogenic Avian Influenza (HPAI), levels of bio-security (prevention and containment) must immediately be raised appropriate to the risk, and there must be early detection and rapid

Annex 18 Animal Health Frequently Asked Questions (contd.)

plus safe culling of infected groups of birds, and those considered in contact with them, in order to halt disease spread.

8. Q) Why does another animal/human health problem seem to follow so quickly on another?

A) Densely populated livestock areas are vulnerable to the introduction and spread of infectious diseases. Apart from livestock density also other factors are important such as the presence of forest reserves and open water bodies in the production area, movement of animals, contamination of lorries, feed and other supplies, and of course the hygiene on the farm, the processing chain and the markets. High concentrations of poultry and pigs are found in western Europe and eastern Asia. The Netherlands experienced a severe outbreak in the year 2003. Over twenty-five million birds had to be culled. Also some human infections occurred.

Hence, the current widespread infections of commercial poultry flocks in many countries of Asia is not a total surprise. The region is known to form an influenza epicentre where birds, other animals and humans live closely together in conditions where viruses have the greatest opportunity to pass from one species to another.

A number of conditions make transmission to humans of a variety of disease agents more likely, including poor sanitation of the chicken stalls in the retailed outlets, the presence of markets in the proximity to living areas, absence of central slaughtering facilities, and, the practice of slaughtering chickens at the retailed outlets.

More in general, the bird flu outbreaks can be considered as part of the process of global change. Traffic and trade dynamics create conditions for viruses, bacteria and parasites to hitch-hike around the world, affecting people, animals and ecosystems. Climate change alters the distribution and abundance of insect vectors, influences bird migration and livestock concentrations. Urbanization, income rise and dietary changes create an increase in the demand for animal production. Poultry industries are expected to continue to expand rapidly in most countries in Asia for the next two decades.

Outbreaks of Avian flu, SARS, foot-and-mouth disease, classical swine fever, Rift Valley Fever are all believed to reflect instabilities in the production environment and perhaps the general agro-ecology. FAO is exploring the linkages between disease occurrence, both in animals and for diseases in humans which are of animal origin, and environmental change, in order to better advise on health implications of production changes in the future.

9. Q) What is the role of hygienic practises in prevention and containment of the disease?

A) Avian influenza usually spreads when live birds carrying infection are bought and sold, and by contact of birds with bird droppings on dirty equipment, cages, feed, vehicles or shoes/clothing.

- Practising good hygienic practises (bio-security) is therefore an extremely important safety

Annex 18 Animal Health Frequently Asked Questions (contd.)

measure to prevent infection entering domesticated poultry – all persons keeping or working with poultry should play their role in this

- Once the very severe type (HPAI) has been recognised in the trading environment or country, all persons working with poultry should greatly increase the level of hygienic practises to avoid bringing in virus ('bio-exclusion^o) and to prevent virus exiting ('bio-containment^o) if it has already entered a flock, village or region
- Poultry keepers and communities can take practical measures to avoid bringing in virus, and to reduce the risk of spread if it has entered
- SLAUGHTER of poultry is one part of bio-containment since the purpose is to prevent virus leaving a farm/village in live birds
- If good hygienic practises to prevent entry and exit are not in place the effect of slaughter policy is usually greatly reduced virus can leave a farm before signs are seen, and enter others
- Therefore hygiene practises are first line of defence and attack against epidemics of bird flu
- The main risks of virus entry are: bringing in live birds, bringing in objects such as animal and bird cages or feed that has been contaminated by birds, bringing in dirty (faeces contaminated) footwear, vehicles, clothing, that has recently passed through animal markets or chicken or duck farms
- The main risks of virus leaving a region to another are: sale of birds to markets, exit of wild waterfowl which have visited backyard poultry units, people working or selling poultry carrying dirty footwear, clothes, cages, to markets or bird farms

The principles of bio-exclusion are to:

- to identify the most important routes by which virus can enter the unit
 - to focus attention/actions to the most important routes of entry
 - to keep up the level of activity until the risk period is over
- The principles of bio-containment are:
- To keep infection contained within poultry units, thereby reducing risk to neighbouring flocks, villages, zones and regions
 - To act as soon as the risk is identified, since the flocks may already be infected before signs are seen
 - To identify and apply practical means of reducing spread between birds
 - To focus attention/actions to the most important routes by which virus could “move off the premises or village”, and between groups or flocks
 - Community-minded, since the act of containing infection assists the infection to die out, and speeds the work of authorities in control and eradication
- These principles can be used by responsible individuals and authorities at any level to develop practical guidance and advice
 - Poultry keepers have a vital role in bio-containment, and authorities also to engage with livestock keepers (public awareness and communication) , and actions to promote compliance
 - SLAUGHTER of infected poultry is only one part of bio-containment -the other part is played by people acting together to keep disease in and out

10 .Q) Which disinfectant should I use against avian influenza?

A) Soapy water and detergents are first choice for many items.

- The avian influenza virus is more simple to destroy than many viruses since it is very sensitive to detergents which destroy the fat containing outer layer of the virus. This layer is needed to enter cells of animals and therefore destroys the infectivity.
- The virus survives well in water and simple washing may assist the virus to enter into areas where it is picked up by other birds.
- Therefore any washing to remove contamination should always be with detergents (soapy water) or specific disinfectants.
- The biggest danger is bird droppings -the virus likes moist, dirty conditions so it is essential to thoroughly disinfect items that have been in contact with bird droppings - cages, shoes, clothes before working with poultry/entry to a place where poultry are kept.
- Simple hygienic measures can reduce risk - but national authorities are encouraged to prepare and communicate specific guidance of each type of poultry enterprise.

11. Q) What can farmers do to protect their birds ? - Biosecurity practice

A) Biosecurity is a concept for prevention of disease entry/escape that must be practiced by all farmers, cooperatives, abattoirs etc. Lack of biosecurity measures increases the risk for disease or infection entry to the production unit, market, or any commercial operation.

Prevent contamination via people

One of the most common breaks in biosecurity for many transboundary animal diseases, including Avian Influenza, is the entry of people bringing in contaminated materials (clothes, shoes, soiled hands) to where susceptible animals are housed.

Solution:

- Do not allow strangers access to where the animals are housed;
- Provide protective clothes to those that visit the flock, including boots;
- Provide baths with disinfectant for boots (use a pre-disinfectant bath to wash off the organic mater before entering disinfectant);
- Ideally, all farm workers and wanted visitors should take a full shower and use clothes from the farm before entering areas where poultry are kept; Clothes used on the farm, should not leave the farm.
- Producers who use outside workers for assistance on their farms, should ensure that these workers do not have poultry of their own;
- Animal health officials visiting affected premises should be extremely conscientious that they, through their work in epidemiological investigations or vaccination initiatives, could actually be infection and disease spreaders.
- The producers should know the origin of their feed and water. The quality of these should be periodically checked.

Prevent contamination via materials

Another method of disease entry into a flock is through the introduction of contaminated equipment or instruments such as lorries/trucks, egg trays, cages, or feeders. The reuse of equipment (i.e. egg trays) or the purchase of used equipment (i.e. feeders) represents high risk activities.

Solution:

- Clean and disinfect equipment and instrumentation to be used. If it is a cooperative group that brings in specific equipment on a regular basis (i.e. egg trays), insist that these be disinfected prior to introduction.
- Porous materials, such as wood and fibre, are more difficult to disinfect than synthetic materials.

Prevent contamination via animals

However, the most common method for disease introduction is when animals that are incubating or are diseased are brought onto a premise and mixed with susceptible animals.

Solution:

- Ensure the animals to be introduced to the farm/flock are healthy. If possible, a health certification should be obtained.
- Vaccinate only healthy animals.
- Establish a quarantine area where the new animals are not housed with the poultry already on the farm. These housing areas should be separated from each other as much as possible. Use separate workers to handle the different animals. If this is not possible, handle or feed the new animals last.
- Establish mechanisms to separate wildlife from poultry production farms (i.e. use of enclosures and nets). Establish mechanisms to exclude access of cats, dogs, rats and other vermin to where the poultry are raised or where there are laying hens.

All-in-all-out ?

The concept of “all-in-all-out” among biosecurity deserves special attention as it offers an additional safety mechanism. It basically refers to the exclusion of all introduction of new animals, and equipment or feed, once production has started thereby diminishing health risks to the growing broilers. Once the age for marketing the chickens is reached, all animals are removed and sent to the market or abattoir, thereby allowing the workers to clean, aerate, removal of old feed, and disinfect premises prior to the entry of new and highly susceptible chicks. This cycle is continuous and provides ease to systematically provide the necessary points for veterinary care, feed delivery, transportation entry, employee inputs, etc. If, and when, a disease was to enter the flock, the process of removal, cleaning, and disinfection is already established and can be quickly implemented with little down time faced by the farmer.

A safe home

Allowing poultry to have free access to their environment (roads, stagnant waters, plastic, cats and dogs) is perhaps the most difficult aspect to overcome when attempting to control disease and apply some level of biosecurity. In these cases, biosecurity should commence with making

Annex 18 Animal Health Frequently Asked Questions (contd.)

loose chickens truly backyard chickens (not “front-yard” or “under-house” chickens), in a place that they can be observed and properly cared for. Being in a known and comfortable enclosure is also likely to reduce their stress (competition with vehicular traffic and potential predators) and therefore gain weight, lay more eggs, and have less risk for contact with diseased animals.

Conceptually, biosecurity is most successful when a group of neighbours, commercial operators, or villagers practice it.

12. Q) Are there vaccines for animals?

A) Yes, currently there are killed vaccines (i.e. the vaccines contain dead viruses). However, in most countries they are used only in emergency cases. Under normal circumstances a vaccine would not be administered, as it would interfere with the epidemiosurveillance of the disease and stamping-out policy for disease eradication (Note: stamping-out policy is culling all animals in the infected area as the main mean for eradication of epizootic animal diseases). Vaccines are now under development to enable differentiation between vaccinated and field virus infected birds.

13. Q) How effective is vaccination?

A) Current vaccines are very efficient as they protect the birds from field virus infection.

14. Q) How can the diseases be diagnosed in animals?

A) The disease can be diagnosed by serology, e.g. agar immunodiffusion test, ELISA or haemagglutination inhibition test, or by virus identification, e.g. by growing the virus in eggs; identification by haemagglutination; or identification of virus RNA by the polymerase chain reaction(PCR).

15. Q) How can the H5N1 strain of HPAI virus be identified?

A) HPAI virus is commonly identified by assessing the pathogenicity in susceptible chickens. A more rapid and efficient method for HPAI virus identification is the in vitro amplification and sequencing of the virus RNA

16. Q) Whom can I contact for advice?

A) Ministry of Municipality and Agriculture Affairs hotline No(17693900)

17. Q) Should we be concerned?

A) Yes, but there is no need to panic as avian influenza is a bird disease affecting only some people that were in close contact with sick birds. The present form of the virus has not mutated into a form that could spread from human to human (see WHO FAQ).

18. Q) Should I keep all my birds in house and limit contact to wild or free-range birds?

If you are in an area where avian influenza has been diagnosed, isolating your birds would reduce the risk of them being exposed to field virus.

Annex 19 Ten Things You Need to Know About Pandemic Influenza

1. Pandemic influenza is different from avian influenza.

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. An influenza pandemic happens when a new subtype emerges that has not previously circulated in humans.

For this reason, avian H5N1 is a strain with pandemic potential, since it might ultimately adapt into a strain that is contagious among humans. Once this adaptation occurs, it will no longer be a bird virus--it will be a human influenza virus. Influenza pandemics are caused by new influenza viruses that have adapted to humans.

2. Influenza pandemics are recurring events.

An influenza pandemic is a rare but recurrent event. Three pandemics occurred in the previous century: “Spanish influenza” in 1918, “Asian influenza” in 1957, and “Hong Kong influenza” in 1968. The 1918 pandemic killed an estimated 40–50 million people worldwide. That pandemic, which was exceptional, is considered one of the deadliest disease events in human history. Subsequent pandemics were much milder, with an estimated 2 million deaths in 1957 and 1 million deaths in 1968.

A pandemic occurs when a new influenza virus emerges and starts spreading as easily as normal influenza – by coughing and sneezing. Because the virus is new, the human immune system will have no pre-existing immunity. This makes it likely that people who contract pandemic influenza will experience more serious disease than that caused by normal influenza.

3. The world may be on the brink of another pandemic.

Health experts have been monitoring a new and extremely severe influenza virus – the H5N1 strain – for almost eight years. The H5N1 strain first infected humans in Hong Kong in 1997, causing 18 cases, including six deaths. Since mid-2003, this virus has caused the largest and most severe outbreaks in poultry on record. In December 2003, infections in people exposed to sick birds were identified.

Since then, human cases have been laboratory confirmed in some Asian countries and more than half of these people have died. Most cases have occurred in previously healthy children and young adults. Fortunately, the virus does not jump easily from birds to humans or spread readily and sustainably among humans. Should H5N1 evolve to a form as contagious as normal influenza, a pandemic could begin.

4. All countries will be affected.

Once a fully contagious virus emerges, its global spread is considered inevitable. Countries might, through measures such as border closures and travel restrictions, delay arrival of the virus, but cannot stop it. The pandemics of the previous century encircled the globe in 6 to 9 months, even when most international travel was by ship. Given the speed and volume of international air travel today, the

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virus could spread more rapidly, possibly reaching all continents in less than 3 months.

5. Widespread illness will occur.

Because most people will have no immunity to the pandemic virus, infection and illness rates are expected to be higher than during seasonal epidemics of normal influenza. Current projections for the next pandemic estimate that a substantial percentage of the world's population will require some form of medical care. Few countries have the staff, facilities, equipment, and hospital beds needed to cope with large numbers of people who suddenly fall ill.

6. Medical supplies will be inadequate.

Medical supplies of vaccines and antiviral drugs – the two most important medical interventions for reducing illness and deaths during a pandemic – will be inadequate in all countries at the start of a pandemic and for many months thereafter. Inadequate supplies of vaccines are of particular concern, as vaccines are considered the first line of defence for protecting populations. On present trends, many developing countries will have no access to vaccines throughout the duration of a pandemic.

7. Large numbers of deaths will occur.

Historically, the number of deaths during a pandemic has varied greatly. Death rates are largely determined by four factors: the number of people who become infected, the virulence of the virus, the underlying characteristics and vulnerability of affected populations, and the effectiveness of preventive measures. Accurate predictions of mortality cannot be made before the pandemic virus emerges and begins to spread. All estimates of the number of deaths are purely speculative.

WHO has used a relatively conservative estimate – from 2 million to 7.4 million deaths – because it provides a useful and plausible planning target. This estimate is based on the comparatively mild 1957 pandemic. Estimates based on a more virulent virus, closer to the one seen in 1918, have been made and are much higher. However, the 1918 pandemic was considered exceptional.

8. Economic and social disruption will be great.

High rates of illness and worker absenteeism are expected, and these will contribute to social and economic disruption. Past pandemics have spread globally in two and sometimes three waves. Not all parts of the world or of a single country are expected to be severely affected at the same time. Social and economic disruptions could be temporary, but may be amplified in today's closely interrelated and interdependent systems of trade and commerce. Social disruption may be greatest when rates of absenteeism impair essential services, such as power, transportation, and communications.

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9. Every country must be prepared.

WHO has issued a series of recommended strategic actions for responding to the influenza pandemic threat. The actions are designed to provide different layers of defence that reflect the complexity of the evolving situation. Recommended actions are different for the present phase of pandemic alert, the emergence of a pandemic virus, and the declaration of a pandemic and its subsequent international spread.

10. WHO will alert the world when the pandemic threat increases.

WHO works closely with ministries of health and various public health organizations to support countries' surveillance of circulating influenza strains. A sensitive surveillance system that can detect emerging influenza strains is essential for the rapid detection of a pandemic virus.

Six distinct phases have been defined to facilitate pandemic preparedness planning, with roles defined for governments, industry, and WHO. The present situation is categorized as phase 3: a virus new to humans is causing infections, but does not spread easily from one person to another.

Airborne infection: The infection usually occurs by the respiratory route, with the agent present in aerosols (infectious particles $< 5\mu\text{m}$ in diameter)

Airborne precautions: These are additional to standard precautions and are designed to reduce the transmission of diseases spread by the airborne route.

Anteroom: As an extra precaution to prevent airborne transmission, some single rooms used for isolation purposes may include an anteroom where staff may put on and remove personal protective equipment.

Clinical Waste: Also known as “infectious waste” – includes waste directly associated with blood, body fluids secretions and excretions. It also includes laboratory waste that is directly associated with specimen processing, human tissues, including material or solutions containing free-flowing blood, and animal tissue or carcasses used for research.

Also includes discarded sharps.

Cohorting: For infection control purposes, if single rooms are not available or there is a shortage of single rooms, patients infected or colonised with the same organisms can be cohorted (sharing of room(s)). When cohorting is used during an outbreak, these room(s) should be in a well defined area that has been designated for the purpose and is clearly segregated from other patient care areas in the health care facility used for noninfected/ colonized patients.

Contact transmission: Micro-organisms that are transmitted by direct contact with hands/ equipment or indirect contact between and infected or colonized patient and a susceptible patient.

Contact precautions: These are additional to standard precautions and are designed to reduce the risk of transmission of micro-organisms by direct or indirect contact.

Disinfection: A process of removing micro-organisms without complete sterilization.

Droplet infections: Large droplets carry the infectious agent ($>5\mu\text{m}$ in diameter)

Droplet precautions: These are additional to standard precautions and are designed to reduce the transmission of infectious spread by the droplet route.

Health care worker: Any person working in a health care facility, for example, medical officer, nurse, physiotherapist, cleaner, psychologist.

Health care facility: Organization that employs health care workers and cares for patients/clients.

Negative Pressure Room: This is a term used for an isolation room which receives many air changes per hour (ACH) under negative pressure. In other words, the direction of the air flow is from the outside adjacent space (e.g., the corridor) into the room. It is preferable that the air in a negative pressure room is exhausted to the outside, but may be recirculated if the air is filtered through a high-efficiency particulate air (HEPA) filter.⁶

Personal protective equipment: Includes gloves, gowns, caps, masks – (surgical and high efficiency masks), and overshoes. These items are used to protect the health care worker from splashes of blood, body fluids, excretions and secretions or from droplets or aerosolisation of organisms from the respiratory tract. It is the responsibility of the health care worker to put on the appropriate personal protective equipment in any situation that is likely to lead to exposure of blood, body fluids, excretions and secretions.

Standard precautions: These are applied for all patients at all times regardless of their known or presumed infectious status.

Sterilization: The destruction of all microorganisms. This is defined as a decrease in microbial load. Sterilization can be either conducted by physical or chemical means.

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