



Clinical case management guideline for influenza, including pandemic influenza A(H1N1) 2009,

for

Outer Islands of the Republic of Kiribati



SPC

Secretariat
of the Pacific
Community

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Compiled by Dr Seini Kupu,
Secretariat of the Pacific Community (SPC),

in consultation with the Medical Assistants and Principal Nursing Officers
of the Ministry of Health and Medical Services (MHMS), Kiribati

Secretariat of the Pacific Community
Noumea, New Caledonia
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Contents

ACRONYMS AND ABBREVIATIONS	vi
PREFACE	vii
BACKGROUND	viii
INTRODUCTION	1
A. AIM OF THE GUIDELINE.....	2
B. OBJECTIVES.....	2
C. INFLUENZA VIRUSES AND THEIR CHARACTER.....	2
D. THE DISEASE.....	3
i. Mode of transmission	3
ii. Incubation period.....	3
iii. Infectious period	3
iv. Influenza-like illness (ILI) case definition.....	3
v. Uncomplicated ILI	4
vi. Severe acute respiratory infection (SARI)	4
vii. Signs and symptoms of disease progression towards severity	4
E. RISK FACTORS FOR SEVERE DISEASE.....	6
F. INFECTION PREVENTION AND CONTROL.....	7
i. Standard precautions involve safe work practices	7
ii. Environmental cleaning	7
iii. Other non-pharmaceutical infection control measures/interventions to avoid or limit an influenza epidemic	7
G. ASSESSMENT AND TRIAGE.....	8
i. Assumptions.....	8
H. DIAGNOSIS	10
I. MANAGEMENT AND TREATMENT.....	11
i. Home care management.....	11
ii. Antibiotic treatment	12
iii. Antiviral treatment regimens	14
iv. Vaccines	16
J. CONTACT MANAGEMENT	17
i. Definition of contact.....	17
ii. Contacts of suspected and confirmed cases.....	17
iii. Quarantining and restriction	17
K. CONCLUSIONS.....	18
Annex 1: Updated WHO pandemic phases.....	19
Annex 2: Example of hand-washing with soap and running water in Kiribati	20
Annex 3: Collection of nasopharyngeal swabs (NPS) and shipping to Tarawa TCH laboratory.....	21
Annex 4: Management of ILI patients at home.....	23
Annex 5: Preparation of Tamiflu elixir	25

Acronyms and abbreviations

CNS	central nervous systems
COPD	chronic obstructive pulmonary disease
HCW	health-care worker
ICU	intensive care unit
ILI	influenza-like illness
IMCI	integrated management of childhood illness
MA	medical assistant
MHMS	Ministry of Health and Medical Services
NPS	nasopharyngeal swab(s)
PIA (H1N1)	pandemic influenza A (H1N1) 2009
PNOs	principal nursing officers
PICTs	Pacific Island countries and territories
PPE	personal protective equipment
PRIPPP	Pacific Regional Influenza Pandemic Preparedness Project
SARI	severe acute respiratory infection
SPC	Secretariat of the Pacific Community
TCH	Tungaru Central Hospital
WHO	World Health Organization

Preface

This *Clinical Case Management Guideline for Influenza (including pandemic influenza A (H1N1) 2009) for Outer Islands of the Republic of Kiribati* was one of the recommendations from the evaluation of our response to pandemic H1N1 2009. The Secretariat of the Pacific Community (SPC), through the technical assistance of Dr Seini Kupu of the Pacific Regional Influenza Pandemic Preparedness Project (PRIPPP), drafted the guideline, and, through funded workshop training by PRIPPP, piloted it with medical assistants (MAs) from Outer Islands and principal nursing officers (PNOs) through discussions, scenarios and drill. This final product is a result of the findings and recommendations from the consultative workshops and collaborative engagement between SPC and Kiribati's Ministry of Health and Medical Services (MHMS).

The guideline provides guidance for the MAs in their respective duty stations in the Outer Islands to detect, manage and report suspected cases of influenza-like illness (ILI) as defined in the Guideline. Flowcharts on triage and case management are clearly laid out and case definitions are clarified – including uncomplicated ILI, ILI among groups at risk of severe diseases, severe acute respiratory infection (SARI) or clinical pneumonia – and the guideline also includes points of contact and when to communicate with or consult Tungaru Central Hospital for severe cases with possible transfer. Antibiotic and antiviral treatment criteria and regimens, vaccine deployment, and infection control and prevention measures are also clearly tabulated.

It is important to note that in the conclusion of the guideline, MAs are reminded that management of ILI patients is to be linked to and considered together with guidelines for management of other conditions both in adults and, more importantly, children, as contained in the Integrated Management of Childhood Illness (IMCI) guideline. The conclusion also reminds those at management level that medical and health services and resources need to be decentralised so that I-Kiribati, whether they live in the Outer Islands or main islands, share the same privileges of accessing the best health-care services possible.

I wish to acknowledge and commend with appreciation the continuous technical assistance and the various support of SPC, specifically PRIPPP, which has helped both monetarily and through technical assistance and support of our pandemic/emergency preparedness, response and recovery. Collaboration between SPC and the World Health Organization (WHO) on many areas of pandemic preparedness and response to assist Kiribati is also greatly acknowledged.

I believe that our MAs will use this guideline as a tool not just for influenza (including the pandemic H1N1), but also for detecting and reporting other outbreak-prone diseases occurring in the Outer Islands.

Kamrabwa.



Dr Revite Kiriton

Director of Public Health

Background

The Pacific lacks an influenza seasons as observed during the winter months of temperate countries like New Zealand, Australia and United States of America (USA). In other words, influenza outbreaks in PICTs can happen at any time of the year, and PICTs may experience more than one episode of influenza or flu outbreaks in a year. The timing is influenced mainly by the movement of population to and from affected temperate countries of the northern and southern hemispheres during their winter seasons.¹

Seasonal influenza viruses include types A(H1N1) (a separate strain to that of pandemic H1N1 2009), H2N2, H3N2, H3N3 and also influenza virus type B. At the beginning of 2009, Kiribati experienced an outbreak of influenza-like illness (ILI) which was confirmed to be seasonal influenza A(H1N1). A few months later, around June 2009, the Kiribati Ministry of Health and Medical Services (MHMS) reported another increase of ILI, which was later confirmed to be pandemic influenza A(H1N1).

However, in April/May 2009 a novel influenza A(H1N1) emerged that was infecting people in Mexico. It spread worldwide, and on 11 June 2009 was declared to be a global pandemic (Phase 6) by the World Health Organization (WHO).

Pandemic influenza occurs when:

- a totally new or novel virus emerges, and the population has no or very little immunity against it;
- the new virus spreads efficiently from one human to another, causing high morbidity and often similarly high mortality; and
- this new virus spreads globally and involves two or more WHO regions.

Usually but not always, pandemic influenza comes in three waves and there is no guarantee that the virus strain will be the same in all waves.

There are six WHO pandemic phases followed by post-peak and post-pandemic levels (see Annex 1). When WHO declares a phase change, it is at a global level but does not necessarily reflect local or national situations. For example, when WHO declared in August 2010 that pandemic H1N1 2009 was over, the world entered a post-pandemic period. At the same time, New Zealand was experiencing its second wave of pandemic H1N1 2009. (Henceforth throughout this guideline, the pandemic influenza A(H1N1) 2009 will be referred to as PIA(H1N1).)

1 Kupu, S. 2005. PPHSN influenza guidelines for influenza preparedness and control and influenza pandemic preparedness. Secretariat of the Pacific Community (SPC), Noumea, New Caledonia. <http://www.spc.int/phs/pphsn>

All of the countries in the Pacific region except two confirmed the presence of PIA(H1N1). Based on available information on and analysis of the PIA(H1N1) global experience, children and young adults had the highest attack rates.^{2,3} There was a wide clinical spectrum of disease, ranging from non-febrile (no fever) mild upper respiratory tract illness, to febrile ILL, to severe or even fatal complications, such as severe progressive pneumonia or lower respiratory tract disease, respiratory failure, hypoxaemia and death. But overall, the virus had a mild to moderate public health impact.

It is important to note that the behaviour of PIA(H1N1) is similar to the observed and confirmed behaviour of seasonal influenza in many countries. In other words, whether the people contract seasonal influenza or PIA(H1N1), the groups at risk of severe diseases are similar.

(For more information on pandemic preparedness and response, refer to the Kiribati National Avian and Pandemic Preparedness Action Plan 2010 update.)

2 Clinical Management of Human Infection with Pandemic (H1N1) 2009: Revised guidance. WHO, November 2009.

3 Attack rate is the cumulative incidence of infection in a group of people observed over a period of time during an epidemic or it is the number of exposed persons infected with the disease divided by the total number of exposed persons over the period of epidemic/outbreak.



Introduction

While seasonal influenza viruses have affected people of Kiribati over the years, Pandemic H1N1 2009 [PIA(H1N1)] was in the Republic of Kiribati around June 2009, according to confirmed laboratory results for PIA(H1N1) from nasopharyngeal swabs (NPS) taken from patients with influenza-like illness (ILI) at that time. The samples were sent to the Melbourne WHO Collaborating Centre, and after more than a month, three of them came back positive for PIA(H1N1).

This guideline has been prepared to support influenza clinical management in the Outer Islands of the Republic of Kiribati. The Kiribati health system comprises four hospitals, 24 health centres and approximately 70 health clinics, serving a population of about 100,800 who inhabit 32 atolls and one island covering 689 square kilometres (266 square miles). Tungaru Central Hospital (TCH) is the country's main health facility and its referral hospital. There are also three other district hospitals: Betio, Southern Kiribati and London Hospital on Kiritimati Island.

As this may be the first guideline developed and specifically adapted for the situation in the Outer Islands in this region, other countries in the Pacific that have a similar context with limited resources may wish to adopt or adapt this guideline for their use with the permission of MHMS, Kiribati.

A. Aim of the guideline

This guideline aims to provide guidance to health-care workers (HCWs) and medical assistants (MAs) in remote areas of Kiribati in the proper methods of early recognition, triage and management of any person with ILI.

Every case of ILI is presumed to be influenza and suspected to be PIA(H1N1), unless proven otherwise by laboratory testing.

B. Objectives

The guideline's objectives are to:

- guide HCWs in the processes and procedures of detection, investigation and management of ILI and suspected PIA(H1N1);
- encourage communication and sharing of timely surveillance information between the Outer Islands and the Tarawa health authority, and with PacNet;
- minimise impacts caused by PIA(H1N1) by decreasing spread of the disease, reducing morbidity and avoiding unnecessary mortality;
- increase awareness of pandemic influenza and seasonal influenza among HCWs; and
- provide guidance as to the management of contacts.

C. Influenza viruses and their character

There are three types of influenza virus: types A, B and C. Only type A causes pandemics. Types A and B can cause epidemics or outbreaks, while type C causes very mild illness and is thus considered insignificant epidemiologically.

Type B affects only humans while type A is also found in animals. For example, the ongoing bird flu A(H5N1), which is entrenched (endemic) in most parts of Asia, infects and kills both birds/poultry and humans. But the H5N1 virus has not yet been effectively transmitted from human to human, as compared with PIA(H1N1).

The type A influenza virus is constantly mutating, and could potentially develop into a new strain. If this happens, the population will have no immunity against it and a pandemic influenza occurrence will be possible.

Influenza viruses, once passed on from an infected person, can remain on surfaces for long periods and can be further transmitted and cause infection/illness. For example, they can last for:⁴

- up to 2 hours on non-porous (hard) surfaces;
- 8–12 hours on clothes, etc.;
- 24–48 hours on porous surfaces; and
- about 5 minutes on hands.

4 Transmission of influenza A in human beings. <http://infection.thelancet.com> Vol. 7, April 2007.

D. The Disease

i. Mode of transmission

The modes of transmission of PIA(H1N1) have been similar to those of other flu viruses circulating in humans (the disease is commonly referred to as ‘the flu’). It spreads from person to person through:

- close contact⁵ and inhalation of infectious droplets spread during unprotected coughing, sneezing and probably talking;
- contact with infected surfaces, e.g. hands, tables/desks, doorknobs, banknotes and phones, and then from hands to mucosa/conjunctiva of nose, mouth or eyes; and
- the air (this is rare but can happen).

ii. Incubation period⁶

Most commonly 1–4 days but can be up to 7 days.

iii. Infectious period

This can be from 24 hours (one day) prior to the onset of symptoms to seven days after the onset of symptoms. Children, especially younger children, might remain infectious for a longer period of up to 21 days.⁷

iv. ILI case definition

This ILI case definition was endorsed by Pacific Island countries and territories (PICTs) at the WHO International Health Regulations (IHR) and Pacific Public Health Surveillance Network (PPHSN) Syndromic Surveillance Workshop in Auckland in March 2010. ILI is among the four main syndromes included in the implementation of the *Practical Guide for Syndromic Surveillance Implementation in the Pacific Islands and Territories*.

ILI is defined as ‘sudden onset of fever (measured) $\geq 38^{\circ}\text{C}$ AND at least one of the following symptoms: cough and/or sore throat’.

Reports of gastrointestinal symptoms (nausea, vomiting and/or diarrhoea) are reported to be common among patients with PIA(H1N1). Also, fever may not be present in the initial stage but may develop at a slightly later stage during the process of the illness.

Fever is suspected if the patient reports chills and rigour, especially if no thermometer is available at home.

Note: Other common symptoms of viral illness may also be present in patients with ILI; these symptoms include muscle aches, headache, running nose, lethargy, loss of appetite and malaise.

5 ‘Close contact’ refers to a distance of less than 2 metres (6 feet) from the symptomatic person(s).

6 ‘Incubation period’ refers to the period from when a person contracts the virus/germ to when symptoms of illness are first experienced by that person. Note that the person can start infecting others with the virus/germ during the incubation period.

7 Influenza A(H5N1) Interim Infection Control Guidelines for Health Care Facilities. WHO, 2004.

v. *Uncomplicated influenza*

- ILI case definition is met BUT there is no shortness of breath or dyspnoea.
- Diarrhoea and/or vomiting may be present with no sign of dehydration.

Note: Special attention should be given to children – sometimes they may present and considered to be uncomplicated but may deteriorate fairly quickly.

vi. *Severe acute respiratory infection (SARI)*

SARI is defined as ILI plus one or more of the following:

- fast breathing⁸ (also see Table 1 on page 12) and
- infiltrate on chest X-ray. But because X-rays are not available in the Outer Islands, HCWs need to look out for one or more of the following respiratory signs and symptoms:
 - difficulty in breathing and chest heaving;
 - use of accessory muscles, supra-clavicular recession, tracheal tug (mainly in adults and older children);
 - lower-chest in-drawing, sternal recession or noisy breathing when calm, flaring of alae nasi (especially in children);
 - inability to complete a sentence without stopping for air;
 - feeling of suffocation;
 - new chest-signs upon auscultation, including crepitations/rhonchi, decreased breath sound or silent chest, dullness to percussion.

When the SARI case definition is clinically met based on fast breathing count and other chest signs and symptoms as above, the patient is highly likely to be suffering from pneumonia and should be treated accordingly with an antibiotics regimen as suggested in this guideline and/or the treatment guideline used in TCH or as in Table 2 on page 13.

vii. *Signs and symptoms of disease progression towards severity*

- The patient may present first as an uncomplicated ILI (as in point v above).
- Progression or worsening of signs and symptoms may occur within 24 hours of the first presentation to the clinic/health centre. This should prompt an urgent full medical review of the patient's condition and management, including consultation with TCH.
- The trigger signs and symptoms for potential clinical danger to patients may include at least one or any combination from a to e:
 - a. indications of possible oxygen impairment or cardiopulmonary insufficiency:
 - signs and symptoms as in dot-point vi above;
 - turning blue or becoming cyanotic;
 - bloody or coloured sputum;
 - chest pain (either it is a new finding or worsening of previous finding);
 - low blood pressure or hypotension for age; and
 - in children, fast and laboured breathing.⁹

8 Fast breathing is defined as 60 or more breaths/minute for those less than 2 months of age, 50 or more breaths/minute for those 2–11 months old, 40 or more breaths/minute for those 1–5 years old, and 30 or more breaths/minute for those 6 years old and above (including adults). (Source: www.spc.int/phs/PPHSN/Surveillance/Syndromic.htm)

9 http://www.who.int/child_adolescent_health/documents/IMCI_chartbooklet/en/index.html

- b. indications of possible central nervous system (CNS) complications:
 - altered mental status
 - confusion
 - drowsiness
 - difficult to awaken
 - recurring or persistent convulsions (seizures)
 - severe weakness or paralysis
 - unconsciousness or coma.

- c. indications of severe dehydration:
 - dried lips
 - sunken eyes
 - sunken frontanelle (in infants)
 - loss of tissue turgor (especially in children and infants)
 - disorientation
 - decreased urine output
 - decreased activity and lethargy or irritability (especially in children).

Note: Special attention should be given to dehydration in children and infants, as they may deteriorate very fast.

Refer to *Integrated Management of Childhood Illness (IMCI)*¹⁰ for further information and management of infants and children.

- d. persistent high fever and exacerbation/worsening of other symptoms beyond three days

- e. exacerbation of underlying chronic disease, including asthma, chronic obstructive pulmonary disease (COPD), chronic hepatitis, renal failure, diabetes and other cardiovascular conditions.

10 http://whqlibdoc.who.int/publications/2008/9789241597289_eng.pdf

E. Risk factors for severe disease

It has been found that the at-risk groups for severe disease from PIA(H1N1) infection are similar to the at-risk groups identified for complications from seasonal influenza. These include:

- pregnant women, and women up to two weeks postpartum;
- children, especially those ≤ 2 years old;
- people with chronic underlying medical conditions, especially (in decreasing order of severe complications):
 - asthma or other chronic obstructive lung diseases
 - chronic cardiac diseases, especially congestive cardiac failure
 - metabolic disorders, such as diabetes
 - chronic renal disease, hepatic disease and certain neurological conditions;
- any adult or child with impaired immunity or who is immune-compromised because of e.g. cancer/malignancy, HIV or systemic lupus;
- children or people younger than 19 years of age who are receiving long-term aspirin therapy; and
- people ≥ 65 years.

Note: Reports from various sources have shown that obese people, especially the morbidly obese,¹¹ are among those at higher risk of developing complications from PIA(H1N1), requiring hospitalisation or an intensive care unit (ICU) admissions or resulting in death.¹² Similar findings have been reported among disadvantaged and indigenous populations. Obese people are also likely to have one or more of the risk factors mentioned above.

Evidence from various post-PIA(H1N1) reports from the USA, Australia and New Zealand shows that a significant number of young healthy adults have been severely affected and have ended up on respirators in ICUs.¹³

11 'Morbid obesity' is defined as a body-mass index (weight in kilograms divided by square of height in centimetres) of 40 or more.

12 Writing committee of the WHO Consultation on Clinical Aspects of Pandemic (H1N1) 2009 Influenza: 'Clinical aspects of pandemic 2009 influenza A(H1N1) virus infection'. *New England Journal of Medicine* 362:18, 6 May 2010.

13 <http://tvnz.co.nz/health-news/lessons-flu-epidemic-passed-3061228> and *Eurosurveillance* 14: 31, 6 August 2009 www.eurosurveillance.org

F. Infection prevention and control

As mentioned above, PIA(H1N1) and human influenza viruses A and B are transmitted similarly. Appropriate infection control measures (standard, droplet and contact precautions) should be practised and enforced at all times.

i. Standard precautions involve safe work practices

- Hand hygiene, including hand-washing with soap and water (see Annex 2) and hand-sanitising using alcohol-based hand-rub. Note that if your hands are dirty or soiled, they need to be washed. Hand sanitiser or alcohol-based hand-rub is only to be used if your hands appear clean and not soiled.
- Coughing and sneezing etiquette. Tissues and handkerchiefs are to be used only once and then put in a rubbish bin or rubbish container. Coughing into your sleeves or your blouse/shirt or garment is good because the virus remains on those surfaces for only a short time and then dies off. If you cough into your hands, please immediately wash or sanitise them. (Note: You can share these precautionary measures with your patients, friends and community at large.)
- Personal protective equipment (PPE) application. The use of a surgical mask is sufficient to protect against the influenza virus, but masks need to be changed once they feel damp.
- Appropriate handling of used patient equipment.

ii. Environmental cleaning

To prevent the spread of influenza in the workplace, it is important to keep environmental surfaces (especially bedside tables, desks, surfaces in the bathroom, etc.) clean by wiping them down with sodium hypochlorite 1% (Janola).

Studies of influenza viruses have shown that the viruses can survive on environmental surfaces and can infect people for 2–8 hours after being deposited on a surface. Influenza viruses can be destroyed by very high heat but even in lower heat they are inactive after a while. Other chemical germicides, such as chlorine, hydrogen peroxide, detergents (soap) and iodophors (iodine-based antiseptics), are effective against human influenza if used in sufficient concentrations for a sufficient length of time.

iii. Other non-pharmaceutical infection control measures/interventions to avoid or limit an influenza epidemic

- Social distancing.¹⁴
- Isolation¹⁵ of symptomatic patients or quarantining¹⁶ of contacts in the home or health centre or clinic.

14 'Social distancing' refers to keeping a distance from symptomatic persons of 1 metre (3 feet). It also refers to avoiding public gatherings, including church services, cinemas, bingo, etc.

15 'Isolation' is separation of infected persons (cases) from other persons for the period the infected persons are likely to be infectious, in order to prevent or limit the direct or indirect transmission of a virus or infecting organisms.

16 'Quarantining' refers to limitation of freedom of movement for a period of time of well persons who are likely to have been exposed to the virus (contact) to prevent their coming into contact with people who have not been exposed.

G. Assessment and triage

i. Assumptions

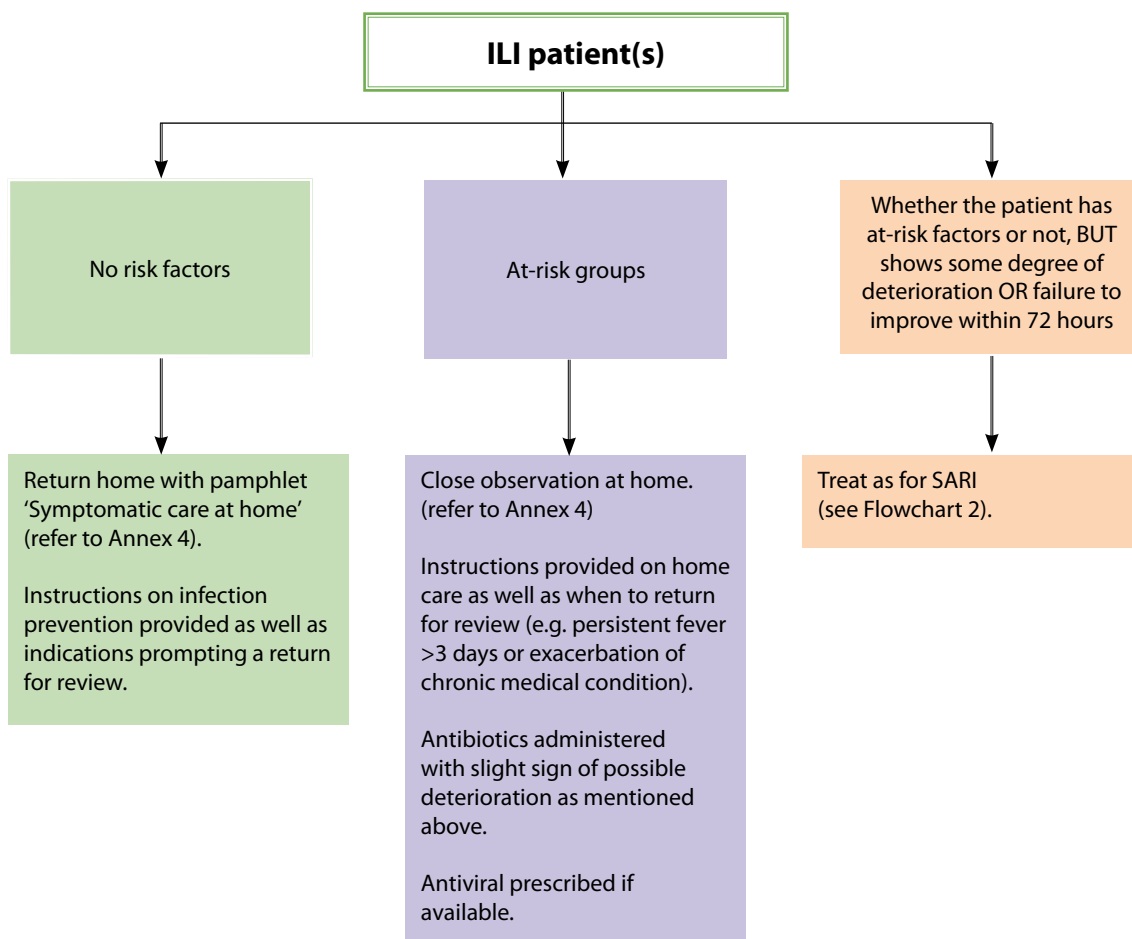
Communicable disease syndromic surveillance is in place and functioning in the Outer Islands, with regular reporting to the Tarawa MHMS Public Health Surveillance Office.

For procedural assessment and triaging, please refer to Flowcharts 1 and 2 below.

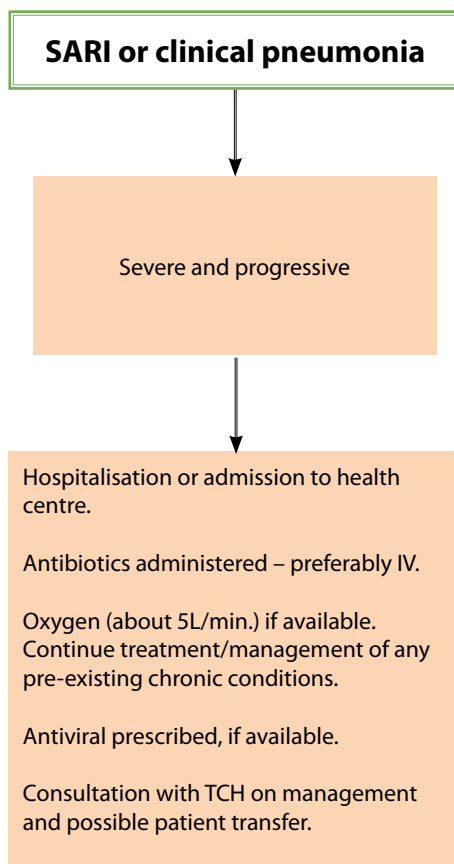
Reminder: Influenza illness is self-limiting and may not need any more action than home care management (see Annex 4). Extra care is demanded when you see a patient who has risk factors or who presents with signs and symptoms of deterioration after three days or 72 hours of having ILI symptoms.

Flowchart 1: Clinical triaging algorithms of/for ILI in the Outer Islands.

(Adapted from Clinical Management of Human Infection with Pandemic (H1N1) 2009. Revised guidance. WHO, November 2009)



Flowchart 2: Clinical triaging algorithms for SARI/clinical pneumonia in Outer Islands.



Note: Infection control precautions during the period that a patient is being admitted to a health centre or clinic include:

- limiting the number of visitors to the patient;
- discouraging or not allowing in those who are among groups at high risk of developing complications from visiting the patient; and
- ensuring staff members and relatives/friends practise strict infection measures when they come into close contact with the patient.

H. Diagnosis

Diagnosis of influenza is made only through laboratory testing, and confirming the virus type is carried out only at Level 2 (L2) and Level 3 (L3) laboratories: the closest to Kiribati are Mataika House in Fiji (L2) and the WHO-collaborating lab in Melbourne, Australia (L2/L3). The TCH lab in Tarawa is Level 1 (L1), like the labs in many PICTs.

Syndromic surveillance of ILI is good enough for Kiribati and its Outer Islands in order to improve its early warning systems enabling them to be better prepared and to mount a timely response to outbreaks. Other outbreak prone diseases include dengue fever, typhoid fever, measles, leptospirosis, and cholera.

Kiribati's TCH lab participates in the CDC-funded lab-based influenza sentinel surveillance project. Sentinel sites have been identified only in the main island of Tarawa and in Betio. However, MAs should be aware that in case there is an increase of ILI activity in their stations, a line list is to be started, and nasopharyngeal swabs of severe cases or those at risk of developing severe diseases need to be taken and sent to the TCH lab. Procedures for NPS are in Annex 3. (The MAs practised NPS in a drill during the training/piloting of this guideline.)

It is vitally important that if an outbreak is suspected or confirmed, investigation and especially response should start regardless of confirmation of the type of virus or bacteria responsible for the outbreak. For influenza or PIA(H1N1), the Kiribati Avian and Pandemic Influenza Preparedness and Response Plan is in place and can be used as a guide and reference.

I. Management and treatment

The Kiribati authority activated a standing order during its response to the recent PIA(H1N1) event. (As part of pandemic/emergency preparedness, a standing order is prepared and passed so that the relevant powers are available to be activated for relevant persons to execute national duties diligently as required.)

To date, most people who have been infected with seasonal influenza or PIA(H1N1) and who have become sick have had self-limiting uncomplicated illness. Supportive therapy and care include rest at home, a balanced diet with plenty of fluid intake, and antipyretics such as paracetamol or acetaminophen. Please take note that salicylates such as aspirin and aspirin-containing products are not to be used in children and young adults (<18 years) because of the risk of Reye's syndrome.¹⁷ For home-care management of uncomplicated ILI patients, please refer to Annex 4.

The reasons why previously healthy people without known risk factors have developed a severe disease following infection with pandemic H1N1 2009 have not been clearly understood to date.¹⁸ However, every patient should be advised to return immediately if any sign or symptom of progressive disease is experienced or observed by carers (especially in children).

i. Home care management

Patients with uncomplicated ILI can be managed at home. If an ILI patient is among those with a high risk of severe illness, they can be managed at home but will require regular follow-up, e.g. home visits (if feasible in your island) or phone calls (if a phone is available).

General principles of management at home include:

- practising infection control measures by the patient, home-carer and other occupants of the house, including regular hand-washing, proper coughing and sneezing etiquette (such as sneezing into your shirt/blouse or your sleeves or 'lavalava') and keeping a distance of 1 metre (3 feet) from the patient;
- hydrating the patient with plenty of liquids in accordance with the needs of the patient's condition;
- ensuring the area/room/house is well ventilated, with doors and windows open;
- using analgesics or antipyretics (paracetamol or acetaminophen are the drugs of choice). Aspirin or aspirin-containing products are not to be used, especially for children and patients who are <18 years of age;
- taking plenty of rest and eating a healthy diet;
- closely observing the patient and reporting or discussing with your colleagues (in other islands or with medical clinicians or the point of contact for consultation in TCH or Betio) any signs or symptoms implying progression to severe disease; and
- applying home isolation and quarantine measures, especially in times of pandemic influenza and/or for patients who are at risk of being infected or at risk of severe diseases.

For more information and detail on home-care management, refer to Annex 4.

¹⁷ Reye's syndrome affects and can be detrimental to many organs, especially the liver and the brain.

¹⁸ Clinical Management of Human Infection with Pandemic (H1N1) 2009: Revised guidance.

ii. Antibiotic treatment

In the past, pandemic influenza and other influenza outbreaks or seasons, and secondary bacterial infection due to *Staphylococcus aureus*, have been identified as mainly responsible for causing severe secondary bacterial pneumonia, with rapid progress and possibly death.

SARI or clinical pneumonia is defined above in Section D. However, in the Outer Islands, where X-ray is not available, pneumonia is defined as ILI plus fast breathing and any one or more of the other respiratory signs and symptoms of progression towards severe disease (see pages 13 and 14)

Table 1: Fast breathing defined by age group.

Age	Respiratory rate
Less than 2 months	60 or more breaths/minute
2–11 months	50 or more breaths/minute
1–5 years	40 or more breaths/minute
6 years and older (including adults)	30 or more breaths/minute

(Source: www.spc.int/phs/PPHSN/Surveillance/Syndromic.htm)

ii(a). Choices of antibiotics for treatment of SARI

Once you decide to treat a patient for SARI, advise the patient (especially if they are to be treated on outpatient basis) to make sure the doses are taken as prescribed and to complete them according to the duration prescribed.

Dosages should be for 5–7 days, depending on the assessment of the condition of the patient, and especially if the patient is among those at high risk of developing severe diseases (refer to Table 2 for dosages). Also, advise the patient that you are going to follow up with them and would like to see them back in three days, or earlier if their symptoms are not improving. At the same time, advise and counsel the patients that it is very important that they comply with the prescribed medications according to dosages and duration of their therapy, even if their conditions improve, as doing that helps to avoid or minimise likelihood of the organisms to develop resistance to the prescribed medication.

Antibiotics to treat likely secondary bacterial respiratory infection or pneumonia should include choices to treat both the community-acquired pneumonia from streptococcus and also from the penicillinase-producing *Staphylococcus aureus*. Though it may be unlikely in the Outer Island setting, methicillin-resistant *Staphylococcus aureus* (MRSA) should be suspected in a case of pneumonia that, despite treatment, continues to deteriorate. This type of situation needs urgent consultation/referral and possible transfer to the next level of care.

According to the Essential Drug Policy of MHMS, there are restrictions on the types of antibiotics available to MAs in the Outer Islands. However, in general, antibiotics such as augmentin, doxycycline and a combination of amoxicillin and flucloxacillin (per oral) or ampicillin and cloxacillin (IV) are good choices and are available in Kiribati. If co-fluampicil (a ready-mixed equal parts of flucloxacillin and ampicillin) is not available, then a combination of the two separate antibiotics is highly recommended for treatment of suspected bacterial pneumonia.

The dosages are as given in the TCH Antibiotic Treatment Guide, but a quick summary is given in Table 2. Also refer to WHO's guidance for pregnant women and infants.¹⁹ If in any doubt, consult with the responsible clinician or back-up focal point for emergency consultation from Outer Islands (the communicable surveillance nurse) at TCH or the Director of Public Health or the medical consultant on communicable diseases.

For mothers and lactating women, antibiotics should be reviewed properly to check that they are safe. Antibiotics such as tetracycline, chloramphenicol and quinolones should NOT be used for these groups of women.

Antibiotics are not to be used as or for prophylaxis.

Table 2: Antibiotics and dosages for treatment of SARI and suspected bacterial pneumonia.

Antibiotic choices	Dosage ²⁰	
	Adults	Children
Amoxicillin* (per oral) [30 minutes before food]	250 mg–1 g every 6 hours	<10 years, half adult dosage
and flucloxacillin (per oral) [30 minutes before food]	250–500 mg every 6 hours	2–10 years, half adult dosage <2 years, quarter adult dosage
Ampicillin (IV)	500 mg–1 g every 4–6 hours	<10 years, half adult dosage
Cloxacillin (IV) [slow IV injection – 2–3 minutes]	250 mg–2 g every 6 hours	2–10 years, half adult dosage <2 years, quarter adult dosage
Augmentin** (or Co-amoxiclav) [375 mg (250 mg amoxicillin + 125 mg ca) and 625 mg (500 mg amoxicillin + 250mg ca)]	1–2 caps/tabs every 8 hours depending on assessed severity of patient	Dosage depends on available strengths of elixirs, e.g. 125/31 or 250/62 or 400/57 [please read the instruction leaflet that comes with the bottle for correct doses]

* Erythromycin can be used instead for those who are allergic to penicillin.

**Augmentin comes in various strengths – please read the instruction leaflet that comes with the medicine before prescribing or advising the dosage. If in doubt, consult the pharmacist/clinician at TCH.

19 http://whqlibdoc.who.int/publications/2006/924159084X_eng.pdf (for pregnant women and newborns)

20 British National Formulary, September 2008.

iii. Antiviral treatment regimens

The seasonal influenza as well as PIA(H1N1) virus is currently susceptible to Tamiflu (oseltamivir) and Relenza (zanamivir), which are neuraminidase inhibitors (NAIs). Some influenza viruses develop resistance to the antiviral medicine, e.g., PIA(H1N1) shows resistance to M2 inhibitors. Relenza is not prescribed for asthmatics.²¹

Starting Tamiflu within 48 hour of the onset of influenza symptoms shortens the duration of illness in otherwise healthy people by around 1–2 days. The earlier treatment is started, the shorter and less severe the illness.

Antivirals are recommended for treatment of ILI cases, especially those at high risk of severe complications. Here is a summary of treatment recommendations:

- Cases of uncomplicated ILI with no evidence of high-risk profile need NOT be treated with antivirals but should be given the brochure for home management or similar advice, and advised to return if the patient's condition worsens after the first three days.²²
- Cases with uncomplicated ILI but on the list of at-risk groups should be treated with antivirals as soon as possible following the onset of illness and without waiting for laboratory results.
- Patients who have severe or progressive clinical illness should be treated with Tamiflu as soon as possible:
 - This applies to all patients, including pregnant women and children <2 years old and infants.
 - Those who receive a normal treatment regimen and show no indication of responding may be considered for a higher dose and longer duration of the Tamiflu regimen, e.g. in adults: 150 mg twice a day. (Note: Before increasing to 150 mg twice daily, there should be discussion with the clinician responsible at TCH. Pregnant women as well as patients with chronic conditions such as renal failure should be considered with caution because there are not enough data that doses higher than 75 mg twice daily are safe for pregnant women, and doses for those with renal failure may need to be adjusted.)
- Cases receiving antiviral medication and aged >5 years should stay home for at least 72 hours after starting the regimen and for five days if <5 years. Also, for children aged <5 years, antiviral treatment can be initiated up to five days from onset of illness²³ whereas adults should begin within 48 hours of onset of illness.
- Lactating mothers should continue breastfeeding if they fall ill or are on antiviral treatment.²⁴ Infection control measures by mothers with ILI should be practised to minimise infection of the baby.

21 http://www.cdc.gov/flu/freeresources/2009-10/pdf/Antiviral_H1N1_factsheet.pdf

22 http://whqlibdoc.who.int/publications/2010/9789241599610_eng.pdf Clinical Management of Adult Patients with Complications of Pandemic H1N1 2009: Emergency guidelines for the management of patients with severe respiratory distress and shock in district hospitals in limited-resource settings.

23 Guidance on the Diagnosis and Management of Pandemic Influenza H1N1, version 5. New Zealand Ministry of Health, April 2010.

24 WHO Clinical Management of Pandemic H1N1 2009 Virus Infection: Eastern Mediterranean Region countries, 17 September 2009.

iii(a) Tamiflu (oseltamivir)

Tamiflu is the most common form/type of antiviral available to most PICTs, and is preferred because it is available in oral form.

Tamiflu at 75 mg twice daily for five days is indicated for adults and adolescents. For infants and children aged 6–12 months and for older children, dosage is by estimated age (see Table 3) and weight (Table 4).²⁵

Table 3: Tamiflu dosage for infants and children aged 6–12 months.

Age	Dosage
>3–12 months	3 mg/kg twice daily
>1–3 months	2.5 mg/kg twice daily
0–1 month*	2 mg/kg twice daily

* There are no data available yet regarding the administration of Tamiflu to infants less than one month old.

Table 4: Tamiflu dosage for infants older than one year and children aged 2–12 years.

Weight	Dosage
15 kg or less	30 mg orally twice a day for 5 days
15–23 kg	45 mg orally twice a day for 5 days
24–40 kg	60 mg orally twice a day for 5 days
>40 kg	75 mg orally twice a day for 5 days

If for any reason adult or child patients cannot swallow the capsules, methods for oral suspension and elixir preparation can be found on the manufacturer’s instruction leaflet enclosed in the boxes with the medication or at <http://www.tamiflu.com/hcp/extprep.aspx>. Alternatively, refer to Annex 5 as to how elixir preparation is carried out in Fiji.²⁶

iii(b) Possible adverse effects of Tamiflu (oseltamivir)²⁷

The most common side effect of Tamiflu is nausea or vomiting, which usually happens in the first two days of treatment. Taking Tamiflu with food can reduce the chance of getting this side effect.

In children taking Tamiflu, vomiting and other gastrointestinal problems are more common.

25 Clinical Management of Human Infection with Pandemic H1N1 2009. Revised guidance. WHO, November 2009.

26 Clinical Practice Guideline (CPG) for Influenza A (H1N1) 2009. Ministry of Health, Fiji. http://www.spc.int/phs/pphsn/Outbreak/InfluenzaA_H1N1/Fiji_Influenza_A_H1N1_2009_Clinical_Practice_Guideline.pdf

27 http://www.cdc.gov/flu/freeresources/2009-10/pdf/Antiviral_H1N1_factsheet.pdf

Some abnormal behaviour and confusion leading to injury has been observed rarely in people with the flu, mostly children, who are being treated with Tamiflu. Flu can also precipitate these behaviours. Persons or carers of persons taking antivirals should be asked to report immediately if there are any signs in the patient of unusual behaviour or problems thinking clearly. This behaviour should be taken seriously by health workers and managed accordingly as suggested below:

- Admit the patient immediately for continuous monitoring of situations.
- Continue to manage the initial Ill condition of the patient.
- Withhold Tamiflu.
- If the patient is on antibiotics, continue the antibiotic treatment if you are sure there is no history of allergy to that antibiotic. If the patient is taking that type of antibiotic for the first time and is not clinically severely sick, discontinue the antibiotic but continue to monitor the patient closely in clinic.
- Report to or consult with the doctor on duty at TCH or the Director of Public Health or the Communicable Disease Consultant for guidance on management and possible referral if the case continues to deteriorate.

iv. Vaccines

Seasonal vaccines are developed using already-existing strains of influenza viruses, and are available for use every year. The components of seasonal vaccines are reviewed twice yearly by WHO to make sure that the viruses that make up the vaccines match the viruses that are circulating among people at that point in time. The vaccine-components for the northern and southern hemispheres may differ.

On the other hand, pandemic vaccines usually cannot be made available until at least 4–6 months after a pandemic is confirmed. This is mainly because the pandemic virus is totally new and it takes a while to study, develop and pilot new vaccines before they can be made available for human populations.

Influenza vaccines remain important as means of reducing the morbidity and mortality caused by influenza viruses. WHO strongly recommends vaccination of high-risk individuals in countries where influenza vaccines are available.

Kiribati does not administer seasonal vaccines routinely. However, WHO has provided pandemic vaccines for about 10% of Kiribati's population. As recommended by MHMS and the pandemic taskforce, priority groups have been identified and the deployment of the vaccine targets these groups and others in accordance with the vaccine deployment distribution strategic plan.

The H1N1 influenza virus that caused the 2009 pandemic continues to circulate in some parts of the world, including Kiribati according to the WHO Pacific Islands H1N1 weekly report 2010. Therefore, Kiribati MHMS should ensure that pandemic vaccine deployment is completed and reports are done and disseminated, including any adverse effects encountered during the campaign.

J. Contact management

Contact management might not be critical with a mild influenza epidemic or pandemic such as PIA(H1N1). Nevertheless, it is important to remember that ILI among high-risk groups still warrants close attention.

i. Definition of contact

‘Contact’ in this context refers to anyone who comes into close unprotected contact – within 1 metre (3 feet) – with a suspected or ILI symptomatic person or laboratory-confirmed case of influenza during the case’s infectious period (incubation and symptomatic period). Once a contact starts showing symptoms, he/she is automatically classified as a suspected case and management should be applied accordingly. Anyone else coming into contact with that person will be regarded as a contact, and the chain of contact will continue as long as the chain of infection is not broken.

Examples of contacts are:

- exposed household members;
- exposed workmates or classmates/teachers in close proximity (within 1 metre or 3 feet);²⁸
- passengers in the same row or up to two rows in front or behind a suspected case’s seat on commercial flights;²⁹ and
- those who have had casual contact, such as hugging, kissing and shaking hands, with symptomatic cases.

ii. Contacts of suspected and confirmed cases

- Monitor contacts among high-risk groups for development of symptoms for seven days after the last exposure to a symptomatic or suspected case. They should be advised to avoid close unprotected contact with well/asymptomatic people during this period of ‘observation’ and to practise proper hand hygiene and coughing and sneezing etiquette at all times, but more so if they become symptomatic.
- If contacts develop symptoms within seven days of last exposure to the suspected case, consider them as suspected cases and manage accordingly.

iii. Quarantining and restriction

Contacts do not need to be quarantined if the circulating influenza is mild but may need to be monitored as mentioned above. They may need to be advised on why and when home quarantine is needed.

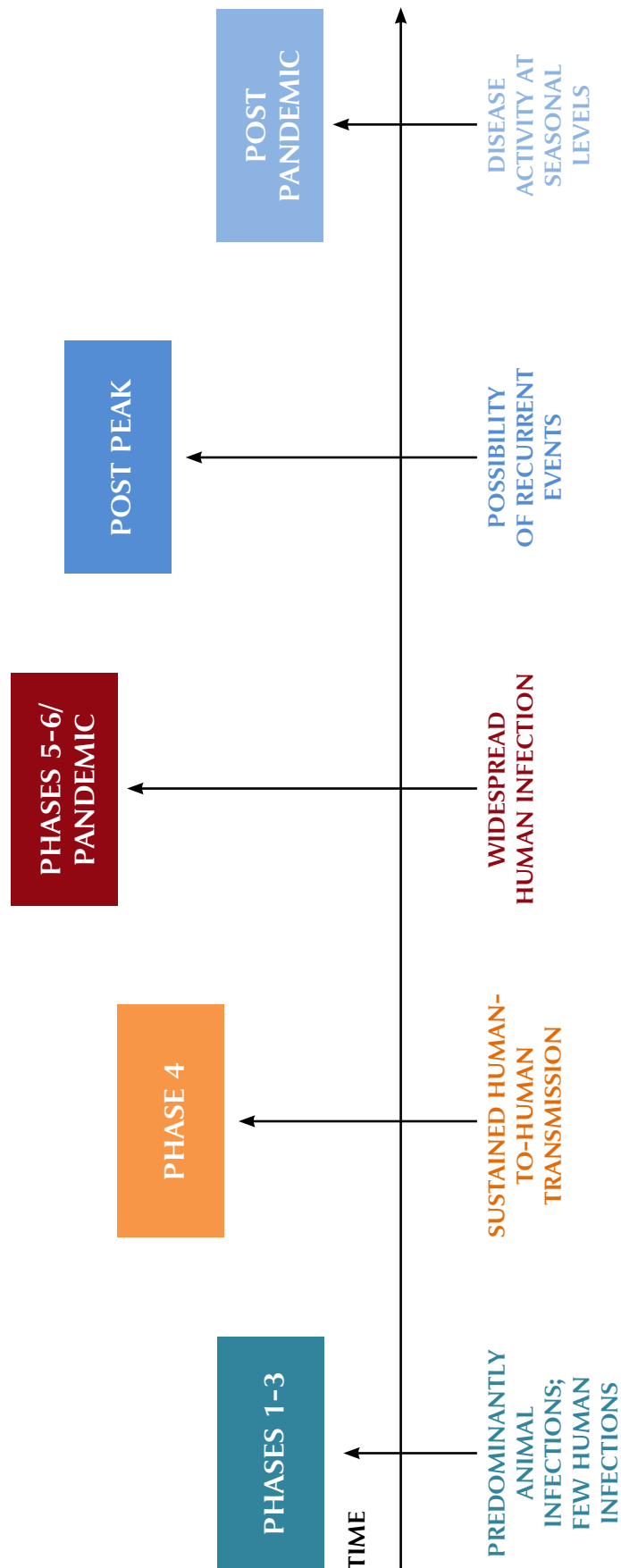
28 Close contact refers to unprotected exposure to symptomatic ILI/influenza patients within approximately 1 meter (3 feet) (www.cdc.gov/h1n1flu/masks.htm)

29 Baker, M.G. et al. Transmission of pandemic A/H1N1 2009 influenza on passenger aircraft: Retrospective cohort study. *British Medical Journal* 340:c2424, 2010.

K. Conclusions

- Access to and use of primary health care (for triage and treatment) as outreach to high-risk and disadvantaged populations, including possible referral of the severely sick to TCH, should be supported and encouraged by health managers and the medical team of MHMS at all times and at all costs.
- Communication and risk communication at community level – including the what, when, and where of seeking medical and health care – are fundamental to the clinical care strategy.
- Clinical care strategies in the Outer Islands of Kiribati should focus on reducing all-cause premature mortality, and local algorithms (as for IMCI and integrated management of adolescent and adult illness (IMAI)) for triage and treatment of common illnesses at primary care level should be supported and implemented widely. Linkage and adaptation between these algorithms and those for influenza are encouraged.
- Management of ILI patients should start as soon as a decision is made based on clinical symptoms and signs, and follow-up arrangements must be made with the patients and their carers.
- Decentralisation of antiviral drugs (if they are available) to primary health-care centres is important and relevant so that disadvantaged and at-risk populations are reached. The same applies for pandemic vaccines. Also, drug policy to facilitate availability of relevant antibiotics in the Outer Islands is recommended, as even a limited stock of antibiotics such as flucloxacillin and Augmentin is above the prescription level of an MA.
- Key principles for clinical management in the Outer Islands are:
 - initiating medical care and stabilising patients with moderate–severe conditions based on symptoms and signs;
 - ensuring availability of appropriate antibiotics to treat suspected secondary bacterial infections;
 - ensuring availability of oxygen at all times;
 - using fluid replacement therapy, especially IV fluids and sets;
 - using emergency means of functional communication systems, such as VHF, satellite phone or similar, for easy consultation and referral of severely sick cases; and
 - early use and monitoring of antivirals according to criteria.
- Strengthen and enforce the practice of standard, droplet and contact precautions at all levels of health care:
 - emphasising the practice of hand hygiene, including hand-washing with soap and water, and use of alcohol-based hand gel if available;
 - proper sneezing and coughing etiquette; and
 - minimum PPE for Outer Islands to be identified, stockpiled and made available when needed. Monitoring and regular stocktake of these small stockpiles is advised.
- Communication in relation to any suspected outbreak or event of public health concern should be directed to the communicable disease surveillance principal nursing officer or as delegated for further necessary actions, as recommended by the Communicable Disease Consultant.

Annex 1: Updated WHO pandemic phases



Annex 2: Example of hand-washing with soap and running water in Kiribati



Photo: Health Promotion Unit, MHMS, Kiribati.

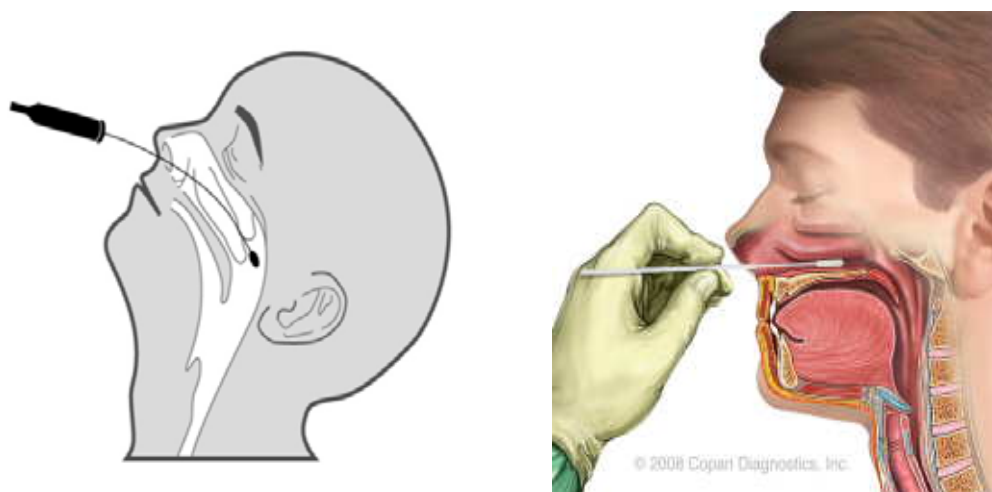
Annex 3: Collection of nasopharyngeal swabs (NPS) and shipping to Tarawa TCH laboratory

- Collection of NPS is indicated for any patient fulfilling the case definition of ILI, unless the situation is an outbreak and the outbreak is not yet confirmed or a non-peak period indicating to take only random samples and/or only for severely ILI patients.
- NPS are carried out during an investigation to confirm an outbreak and what type of virus or organism is causing the outbreak, and once the outbreak is confirmed there is no need to continue taking NPS except for unusually severe cases.
- Once an outbreak is confirmed, relevant response measures should be started and should continue accordingly regardless of whether the type of virus or organism has been confirmed.
- NPS can be taken by any experienced health-care workers trained in the procedure.
- Note that during the off-peak months of temperate countries, such as New Zealand, Australia and USA, random sampling of NPS or taking NPS from severe patients is recommended.
- Note also that there is no 'flu season' in the Pacific region and this makes diagnosis of influenza unpredictable, meaning that in the Pacific it is best to carry out ILI syndromic surveillance and take NPS as indicated.

Procedure for NPS collection

- Explain the procedure to the patient.
- Warn the patient that when a swab is taken it usually causes discomfort and she/he may feel like drawing the head back or gagging. Also, she/he may experience teary-eye on the side of the nasopharynx that is being swabbed.
- For this reason it is important to get the patient to sit in the position shown in Figure 1. This reduces the tendency for the patient to pull away during the procedure.

Figure 1: Positioning of patient for NPS.



Preparatory requirements for health-care worker taking the sample:

- a. Wash and dry hands properly.
- b. Put on relevant PPE (surgical mask and gloves – which need to be discarded properly into a rubbish bin after single use). Goggles are rarely needed.
- c. Position the patient properly and proceed once she/he is positioned as in Figure 1.
- d. Insert the swab into one nostril backwards towards the ear along the nostril floor until you reach the nasopharynx, a procedure which is often met with resistance. This is approximately half to two-thirds of the correct NPS. (Note: Do not force the swab if an obstruction is felt before reaching the nasopharynx. If an obstruction is met, remove the swab and try the other nostril.)
- e. Rotate the swab and gently leave in place for 5–10 seconds, then gently remove it.
- f. Immediately place the swab into the collecting vial with the viral transport media (VTM) or stain it into a glass slide and fix with alcohol, dry and make ready for transport to TCH. (Lab note: Wooden swabs are not used for NPS.)
- g. Repeat the procedure with the other nostril.
- h. Specimens are to be placed in a coolbox or in a fridge if available.
- i. Complete the form.
- j. Put the form and the specimen in the special plastic container ready for shipping/transfer to TCH-Lab.
- k. Inform the TCH lab of the expected time of arrival of specimens.

NPS in children

- Ask parent or carer to kindly assist in the process as that may help to calm the child better.
- Gently get the child to sit on his/her parent's/guardian's lap and ask the adult to hold the child's upper body in a tight hug, and to hold the child's lower limbs between the parent's/carer's thighs.
- An assistant can hold the child's head in place with both hands from behind the parent/guardian.

Annex 4: Management of ILI patients at home

(Adapted from WHO Clinical Management of Pandemic H1N1 2009 Virus Infection: Eastern Mediterranean Region countries, 17 September 2009)

The principles of management of patients at home target three categories of people, namely the patient, the carer and those who are in the same household; in addition, there are visitors. The recommendations below can be used or practised by anyone.

Children, especially younger children, and the immunocompromised might potentially be shedding virus longer than the normal range of up to seven days.

(i) Special recommendations for uncomplicated ILI patients at home:

- Keep the patient in a separate room or area in your house, and ensure there is good ventilation. (Good ventilation means that good airflow is achieved by opening windows/louvres and/or doors.)
- Maintain a distance of at least 1 metre (3 feet) from the ill patient.
- Patients should avoid mixing with 'well' people as much as possible until the patients become asymptomatic.
- Patients should wear surgical masks if they need to be in a common area near other healthy/asymptomatic people.
- Practise good hand hygiene by washing hands with soap and running water (or water pouring from a jug or similar), frequently and thoroughly, and drying properly, or use hand sanitiser or alcohol-based hand-rub if available.
- Practise proper sneezing and coughing etiquette at all times, such as sneezing into your sleeves or the inside of your blouse or shirt, or coughing/sneezing into a tissue/cloth and disposing of it immediately into a rubbish bin or similar. If you cough into your hands, wash them with soap and water immediately. http://www.spc.int/phs/PPHSN/Outbreak/Influenza_A_H1N1.html#cough_poster
- Get enough rest and take plenty of fluids.
- Use analgesics or antipyretics. The drug of choice is paracetamol or acetaminophen. DO NOT give aspirin or products containing aspirin to children or patients 18 years old and younger due to risk of Reye's syndrome.³⁰
- Ensure that common contact surfaces, such as doorknobs, the telephone, tables and desks, are frequently cleaned and/or disinfected.
- Report any signs/symptoms of progression to severe disease as soon as possible to the health authority.

(ii) Special recommendations for the protection of other persons at the home of an ILI patient:

- The sick person should not have visitors other than care-givers; if she/he does, keep visitors at a distance (1 metre or 3 feet) and follow hand hygiene.
- If possible, only one adult person should be identified at home to take care of the sick person. (People in high-risk groups for complications, including pregnant women, should not be the designated caretaker, if possible.)
- Close contact of less than 1 metre (3 feet) from the ill person should be avoided as much as possible.

30 Reye's syndrome affects and can be detrimental to many organs, especially the liver and the brain.

- Well persons, especially those in high-risk groups for complications from influenza, should strongly avoid close contact within 1 metre (3 feet) of household members who are sick with influenza. If close contact with a sick individual is unavoidable, wearing a face mask should be considered for the patient and/or for both persons.
- Conversely, sick family members should not care for infants and other groups at high risk of complications from influenza.
- The sick person should cover her/his coughs and sneezes as mentioned above. In case the person coughs into her/his hands, she/he needs to wash as soon as possible with soap and water or use alcohol-based hand-rub.
- All persons in the household should clean their hands frequently with soap and water or an alcohol-based hand-rub, especially after every contact with the sick person or the person's room or bathroom, and avoid sharing food. Avoid touching your eyes, nose or mouth if your hands are not properly cleaned.
- Cloths and paper towels should be used only once for drying hands after hand-washing OR a hand towel should be dedicated to each person in the household.
- If possible, consideration should be given to maintaining good ventilation in shared household areas (e.g. keeping windows open in the kitchen and bathroom).
- Household members should monitor themselves for flu-like symptoms.

(iii) Special recommendations for the protection of care-givers of Ill patients:

- A surgical mask should be used by both patient and carer while providing care to the patient, especially if the carer is less than 1 metre (3 feet) away from the patient.
- When holding small children who are sick, their chin should be placed on the shoulder of the care-giver so that they do not cough into the care-giver's or someone else's face.
- Hands should be cleaned with soap and water or an alcohol-based hand-rub after touching the sick person or handling used tissues or laundry used by the sick person.
- The care-giver and household members should monitor themselves for flu-like symptoms.
- Seek immediate medical care if symptoms occur, especially if progression to severe disease occurs or if symptoms appear in a person at high risk of developing a severe disease.

(iv) Special recommendations for home care for household cleaning, laundry and waste disposal:

- Tissues and other disposable items used by the sick person should be thrown away in rubbish containers.
- Hands should be washed after touching used tissues and similar waste.
- Household surfaces (especially bedside tables, surfaces in the bathroom, and children's toys) should be kept clean by wiping them down with a household disinfectant.
- Linens, eating utensils and dishes belonging to those who are sick do not need to be cleaned separately, but should not be shared without first washing thoroughly.
- Linens (such as bed sheets and towels) should be washed using household laundry soap. Hands should be cleaned with soap and water or alcohol-based hand-rub straight after handling dirty laundry.
- Eating utensils should be washed with soap and water.
- The bathroom used by the sick person should be cleaned daily with household disinfectant.

Annex 5: Preparation of Tamiflu elixir

1. Properly clean and dry two small bowls or cups.
2. Carefully pull open one Tamiflu 75 mg capsule over one bowl or cup and pour in the powder.
3. Using a graduated syringe, add 5 ml water to the Tamiflu powder in the bowl or cup.
4. Stir for 2 minutes or so, ensuring the powder and water are well mixed or combined.
5. Draw into the syringe the correct dosage from the bowl or cup according to Tables 3 and 4 on page 22.
6. Push down the plunger of the syringe to empty its entire contents into the second bowl or cup.
7. Stir this mixture well and give to the child or patient to drink.
8. The mixture must be swallowed immediately after its preparation. If there is any mixture left, rinse the bowl with a small amount of water and have the patient drink the remaining mixture.
9. You may prepare a sweet drink and give it to the patient following the taking of the Tamiflu elixir, if you consider this appropriate.
10. Discard any unused mixture.

NB: Wastage is a factor when doing this procedure. However, if the patient is in an at-risk group of severe complication from influenza, it is important to follow the procedure regardless.

