PACIFIC PUBLIC HEALTH SURVEILLANCE NETWORK (PPHSN) INFLUENZA GUIDELINES

PART I: GUIDELINES FOR INFLUENZA PREPAREDNESS & CONTROL

PART II: GUIDELINES FOR INFLUENZA PANDEMIC PREPAREDNESS

PREPARED BY DR SEINI KUPU IN CONSULTATION WITH THE PPHSN INFLUENZA SPECIALIST GROUP (ISG)

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FOREWORD

WHY Influenza?

- Influenza is a common outbreak-prone disease that can seriously affect, and even kill, people with chronic diseases (e.g. non-communicable diseases, which are of increasing importance in the Pacific Islands). The 1918 influenza pandemic caused an estimated 20–40 million deaths worldwide. Pacific Island countries and territories (PICTs) experienced fatality rates up to 24% of the entire population.
- Prevention for high-risk populations exists (immunization and chemoprophylaxis).
- An influenza outbreak can be very costly to health services.
- A new pandemic may occur at any time due to potential major changes in the virus ("antigenic shift"), and there would be no or little immunity against the resulting virus in the world population. The likelihood of a new pandemic is especially high nowadays, with the Highly Pathogenic Avian Influenza (HPAI) situation in Southeast Asia: the last pandemics all commenced in southern China, where the conditions for the emergence of a new influenza virus are met.

Therefore, it is important that Pacific Islands seriously assess the importance of influenza and prepare to respond to influenza outbreaks, especially to a new pandemic of influenza. For that reason, influenza is one of the target diseases of the Pacific Public Health Surveillance Network (PPHSN).

Background of PPHSN guidelines

Following the launch of EpiNet, the "response arm" of the PPHSN, and the identification of EpiNet outbreak response teams in the all PICTs in 2001, it was felt important that the members of these teams have access to appropriate guidelines for the surveillance of and response to (or control of) outbreak-prone diseases. Pacific Island "ownership" of these guidelines, which would take into account the regional Pacific Island context, was considered to be critical.

Work towards preparing the various guidelines was begun, starting with three PPHSN sub-regional EpiNet workshops co-organised by SPC and WHO in Guam, Noumea and Apia from December 2001 to March 2002. The objectives of the workshops included the development of protocols and plans for communicable disease surveillance and response at national and regional level. The aim of the workshops was to draft PPHSN regional surveillance and response guidelines for a number of PPHSN target diseases. Two of six diseases targeted by the PPHSN[1] were addressed at each meeting. The output from all three workshops was shared with all EpiNet team members through a CD-ROM.

The plan was for Pacific Island health professionals experts in the respective areas of expertise to further develop, refine and finalise these draft guidelines, using an agreed template. Within the context of changing priorities, this whole process has taken some time.

1. Cholera, dengue, influenza, leptospirosis, measles and typhoid fever.

In 2003, SARS (severe acute respiratory syndrome) was, amongst others, the scourge that reminded us and the world about the emerging and re-emerging infectious diseases. SARS became the focus of PPHSN activities for at least a few months. A guidance document was issued by the PPHSN, and it was constantly updated as new evidence was revealed about this modern enemy.

In the light of that threat, influenza took on even more importance: Pacific Islands had to be prepared for a situation of simultaneous circulation of SARS and influenza. Symptoms of both diseases are very similar, so simultaneous outbreaks of SARS and influenza could lead to a very confusing, difficult and dangerous situation.

Although planned in 2002, before SARS, the Influenza Specialist Group (ISG) was urgently set-up at the PPHSN regional EpiNet workshop "Building on the SARS experience — preparing PPHSN for emerging and re-emerging infectious diseases" in September 2003.

The major points of the terms of reference for the ISG are to:

1. Oversee development of the section on influenza in the PPHSN guidelines for the control of communicable diseases.
2. Oversee development of the PPHSN guidelines for influenza pandemic preparedness and response.
3. Be advocates within the PPHSN for all influenza matters.
4. Be a communication link on influenza for the PPHSN.

By the end of 2003, the first draft version of the section of the influenza guidelines, prepared by the ISG, was ready. More work needed to be done, especially in the area of pandemic preparedness and response. This was achieved by Dr Seini Kupu, ADB consultant to the PPHSN, in consultation with the ISG and the EpiNet teams[2].

After PPHSN SARS guidelines, which were published only on-line given the changing evidence, this is the first part of the PPHSN guidelines to be also published as a hard copy document. The sections on the other PPHSN target diseases will follow. A pocket or field format of for each section, with practical information only, is also being prepared.

Dr Tom Kiedrzynski
Epidemiologist,
SPC

2. Especially, at the 2nd regional EpiNet workshop, PPHSN Preparedness for Influenza & Other Potential Threats like Dengue and SARS.

ACKNOWLEDGEMENTS

We would like to express our (PPHSN and ISG) warm gratitude and great appreciation to the Asian Development Bank (ADB) for the monetary assistance through its project for "SARS emergency assistance to developing countries" by contracting Dr Seini Kupu to assist PICTs on issues pertaining to control, prevention and preparedness to threat or event of influenza pandemic, SARS and also addressing other related issues including writing and putting together PPHSN guidelines in close consultation with the ISG.

We also express our acknowledgement and great appreciation of the various efforts and contributions of members of the Influenza Specialist Group (ISG) towards the development of these PPHSN guidelines. The ISG members include Dr Hitoshi Oshitani (WHO, WPRO), Dr Rob Condon/Dr George Slama/Dr Babatunde Olowokure (WHO, SP), Dr Tom Kiedrzynski (SPC), Dr Salanieta Saketa (MOH, Fiji Islands), Dr Ian Barr (WHO-CC Melbourne), Dr Alain Berlioz-Arthaud (IPNC, New Caledonia), Dr Nuualofa Tu'uau Potoi (MOH, Samoa), Dr Joe Koroivueta (Mataika House, Fiji Islands) and Dr Seini Kupu (MOH, Tonga).

Also, special gratitude is expressed to PPHSN working partners, WHO, SPC, and FSMed through its School of Public Health and Primary Care, for their support and contribution of insights into the development of these guidelines.

In all, a heartfelt thank-you goes out to all of you who made contributions towards the development of these documents.

Malo 'aupito

PART I

GUIDELINES FOR INFLUENZA PREPAREDNESS & CONTROL

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EXECUTIVE SUMMARY

Influenza in the Pacific is not yet recognized as a priority disease, which may be precipitated by lack of good information both on the epidemiology of influenza and on the impact of an outbreak. “Routine” — i.e. interpandemic influenza or, as simply referred to, “flu” — often occurs as an annual event in the temperate countries during winter months. But since the Pacific Island countries and territories (PICTs) do not have a flu season as the temperate countries do, influenza outbreaks can happen any time of the year, and these are mostly influenced by the flow of people from and to flu-affected temperate countries rather than by the local climate itself.

Though influenza pandemic is unpredictable and more threatening, and may cause high morbidity and mortality, “routine” influenza outbreaks that occur more regularly with winter seasons covering more confined geographical areas still cause high morbidity in the general population, and significant mortality among especially vulnerable groups like people 65 years and over and those who have underlying chronic conditions. Influenza infection and “flu outbreak” are also routinely associated with the considerable economic and social costs resulting from absenteeism from work and school, and from hospitalization. Reliable data on these issues are sparse in the PICTs, however, so it is hoped that these guidelines will assist PICTs in developing or refining their respective influenza-like illness (ILI) surveillance systems.

These guidelines for influenza preparedness and control aim at providing basic information on the nature and epidemiology of the influenza virus and the disease itself. They emphasize the setting-up of feasible ILI surveillance systems, prevention and investigation of an outbreak; response to a confirmed outbreak; and clinical management of those with ILI and complications. It is anticipated that this document will be reviewed and updated from time to time to ascertain that the content is contextually applicable to PICTs.

This is the first part of the PPHSN Influenza Guidelines. The PPHSN pandemic preparedness guidelines are in the second part. The development of the influenza preparedness and control guidelines was coordinated mainly by Dr Seini Kupu, in her role of ADB consultant to the PPHSN.

Happy reading and we hope that enthusiasm will be generated towards setting up efficient surveillance systems to provide useful information for prevention and control of influenza and influenza pandemic.

Malo ‘aupito

Dr Seini Kupu
ADB consultant to the PPHSN

ACRONYMS

ADB	Asian Development Bank
AIDS	acquired immunodeficiency syndrome
DOH	Department of Health
GROG	Groupes Régionaux d'Observation de la Grippe
HIV	human immunodeficiency virus
HPAI	highly pathogenic avian influenza
IEC	information, education and communication
ILI	influenza-like illness
ISG	Influenza Specialist Group
MDCK	Madin-Darby canine kidney
MOH	Ministry of Health
PICTs	Pacific Island countries and territories
PPHSN	Pacific Public Health Surveillance Network
RT-PCR	reverse transcriptase polymerase chain reaction
RSV	respiratory syncytial virus
SPC	Secretariat of the Pacific Community
TCID	tissue culture infectious dose
WHO	World Health Organization
WHO-CC	World Health Organization Collaborating Centre for Reference and Research on Influenza
WPRO	World Health Organization Regional Office

1. BASIC DISEASE FACTS AND BACKGROUND

Influenza is an acute respiratory infection caused by influenza viruses. Influenza A and B are associated with annual outbreaks and epidemics of influenza, while the third type, Influenza C, causes only very mild illness and has not been associated with either epidemics or pandemics. Only Influenza A viruses can trigger a pandemic, an event which occurs when the viruses drastically change their genetic compositions at unpredictable intervals, counteracting individual and herd immunity conferred by previous infection with the viruses or in response to vaccinations.[1–4]

During the 20th century, **influenza pandemics** occurred in 1918 ("Spanish flu"), 1957 ("Asian flu") and 1968–1969 ("Hong Kong flu"). The 1918 pandemic caused an estimated 20–50 million deaths worldwide; Pacific Island countries and territories (PICTs) experienced fatality rates up to nearly a quarter of the entire population.[5] The 1957 and 1968–1969 pandemics were each responsible for about one million deaths worldwide.[2,3]

While pandemics can be devastating when they occur, **nonpandemic strains**, which may differ only slightly from previously circulating strains, can inflict significant levels of illness and death. This can be seen especially in naïve populations or in areas where there is poor nutrition and few health-care facilities, as has been seen recently in Madagascar and in the Democratic Republic of the Congo in 2002. (http://www.who.int/disease-outbreak-news/n2002/august/23august2002.html)

While **outbreaks of influenza** occur mostly in the winter in countries with cooler climates, tropical and subtropical regions can have influenza circulating all year round, although normally the highest incidence occurs during the cooler or wetter periods. More specifically, in the Pacific, the annual incidence of influenza varies according to geographic location, travel patterns of tourists and citizens (from areas where influenza is circulating) and climatic conditions.

Typically, **new pandemic strains** of influenza virus emerge in China or Southeast Asia and from there spread to the rest of the world. Due to the direct and one-stop flights between PICTs and Asia, public health authorities are likely to have limited advance warning of a new pandemic strain of influenza arriving in the Pacific.

Sporadic transmission of new influenza viruses from animals to humans can occur from time to time anywhere in the world; recent examples include the Hong Kong "bird flu" (H5N1) outbreak of 1997 and the Netherlands "chicken flu" (H7N7) outbreak of 2003.

The most recent incidents of documented transmission of influenza viruses to humans were in 2004 in Viet Nam and Thailand, when H5N1 avian influenza was confirmed in several humans diagnosed with severe respiratory illnesses, a number of whom later died.

The management of influenza outbreaks relies primarily on active and collaborative global, regional and national surveillance, and the timely production of appropriate vaccines. The prevention of mortality also depends on local capacity to treat the complications of influenza, especially pneumonia.

In the event of indications of pandemic influenza, the World Health Organization (WHO) is mandated to:

- provide information on the onset of an influenza pandemic;
- recommend vaccine composition, and assist increased capacity for production and distribution;
- issue guidance on the best use of antiviral drugs;
- work with regional offices and partner agencies to encourage consistent and coordinated activities among nations facing similar challenges from the pandemic;
- mobilize resources for countries with limited capacity; and
- enhance its monitoring and reporting of the global spread and impact of the virus.

2. DESCRIPTION OF THE DISEASE: CLINICAL ASPECTS

Influenza, or "the flu", is a highly contagious disease caused by the influenza virus. It attacks the respiratory tract in humans (nose, throat, and lungs). Unlike many other viral respiratory infections, such as the common cold, influenza causes severe illness and life-threatening complications in some people.

The clinical case definition of influenza or otherwise referred to as influenza-like illness (ILI) is "acute onset of fever (>38°C), with the following symptoms: cough or sore throat and myalgia in the absence of any other diagnoses" (adapted from WHO definition of clinically suspected influenza or ILI).

Uncomplicated flu is usually self-limiting. Definitive diagnosis of influenza infection requires laboratory confirmation as these general symptoms are shared by many other disease conditions.

Possible complications of influenza include:

- otitis media, acute sinusitis and tracheobronchitis
- pulmonary complications like primary viral pneumonia which may be associated with rapid progression leading to severe respiratory distress which may be fatal (rare). Secondary bacterial pneumonia may be suspected in individuals who deteriorate after initial flu-like illness. Individuals with chronic medical respiratory conditions (chronic bronchitis, asthma, cystic fibrosis) are more vulnerable. A combination of viral and bacterial pneumonia may be affecting the patient, but clinically the presentations may be difficult to differentiate.
- cardiac complications including atrial fibrillation[3,4] (especially in people with underlying cardiac conditions and the elderly), cardiac failure exacerbation, myocarditis and pericarditis (not common)
- Reye's syndrome, which is mostly seen with influenza B and more rarely influenza A in children who are on aspirin. The syndrome is characterized by acute encephalopathy and hepatic failure (secondary to fatty infiltration of liver).
- myositis with muscle tenderness and limb pain associated with myoglobinuria
- central nervous system complications like Guillain-Barré syndrome, encephalitis and transverse myelitis (rare).

Overall mortality usually ranges from 0.1–0.5/1000. Most of the deaths are in the vulnerable groups, especially the older age group (>65 years).

3. EPIDEMIOLOGY

Seasonal peaks of influenza occur every year in temperate climates but can vary in intensity. They tend to follow a characteristic pattern. If they are higher than expected according to ILI activity baseline, they are called “epidemics”. Epidemics — or outbreaks — of influenza can also occur in tropical climates.

In PICTs, there is no clear seasonal pattern of influenza activity as commonly observed in temperate countries and which enables these countries to prepare themselves for the coming of the influenza season, during the winter months. When the event is seasonal, countries can get people vaccinated, using the WHO recommended vaccine combination for either the Northern or Southern Hemisphere, well in time before winter arrives. However, developing island nations such as the PICTs can get imported influenza from any of the temperate countries, as air travel is very fast. Often, people avoid the winter cold in their own countries by travelling to the warmer countries of the tropics and subtropics; as well, people from the tropics/subtropics go to Europe during their winter months for holidays, as is the case in New Caledonia. Influenza viruses travel with these people if there is an increased influenza activity or epidemic in their home country. Influenza viruses are usually transported and spread around to new places in this manner.

3.1 Epidemics of influenza

At the outset of a typical epidemic, there is often is an increase in numbers of children suffering from fever, with cases reaching a peak over the following 2–3 weeks. This is closely followed by an increasing number of adults with influenza-like illnesses, and absenteeism from school and work peaks during this period. Finally, there is a rise in hospital admissions for patients with pneumonia, exacerbation of disease in patients with chronic pulmonary disease and heart problems, and a corresponding rise in deaths from these conditions.

The whole outbreak usually lasts about 5–6 weeks. However, in tropical regions there may be more than one wave of influenza during the year.

An influenza epidemic may infect up to 60% of those in closed communities (e.g. nursing homes, prisons etc.). Epidemics result from a combination of antigenic drift (see Section 3.4), which occurs from season to season, and waning immunity among the population. Epidemics usually involve a single type or subtype of influenza but on occasions can involve two or even three different influenza virus strains.

The types and subtypes of influenza viruses that are likely to circulate is unpredictable; however, in recent decades A(H3N2) viruses have circulated most frequently, influenza B tends to be prominent every second year, and the presence of A(H1N1) has been less frequent and more sporadic. The rate of antigenic change has been in the same order, with A(H3N2) having most change, followed by B then A(H1N1) viruses.

Several interpandemic outbreaks in PICTs had been observed to coincide closely with winter months elsewhere in the world. Summer or winter in the Pacific may be seen as differences in temperature than seasons. It may be of interest to look at Pacific data and patterns for flu which may suggest cold and warm months. For example:

- A(H1N1) epidemic in Fiji Islands occurred around April 1978 and ended by the end of May, and where A/Fiji/5107 and A/Fiji/5096 like viruses were isolated.[17]
- Niue during May and June 1983, influenza A/Bangkok/1/79(H3N2) caused an epidemic where two people died.[16]
- March to April 2004, an influenza outbreak was reported in Solomon Islands, and confirmed from the WHO collaborating influenza centre in Melbourne to have been caused by influenza A/Fujian/411/2002-like, a subtype which was similar to that circulating in Australia and New Zealand and in the Northern Hemisphere during 2003–2004.[18]
- Also, in March–April 2004, Fiji Islands experienced an influenza outbreak which was due to influenza A, and at Suva Private Hospital alone as many as 200 people a day were seen.[19]

Thus, it is very important, and feasible for PICTs to set up good surveillance systems, including virologic surveillance, so that identification of influenza viruses in a timely manner can assist in control and prevention of influenza outbreaks. This will also assist in identification of new influenza strains or untypeable virus strains to enhance global surveillance, regional and national efforts.

Available information on virological influenza surveillance from sentinel sites in New Caledonia shows bimodal peaks and no definite influenza patterns throughout the five-year duration of sentinel influenza surveillance (Figure 1).[20] This is the usual pattern observed in tropical and subtropical countries like PICTs, and it implies that influenza might be imported, thus emphasizing further the vulnerability of PICTs to influenza epidemics, and threats of pandemics.

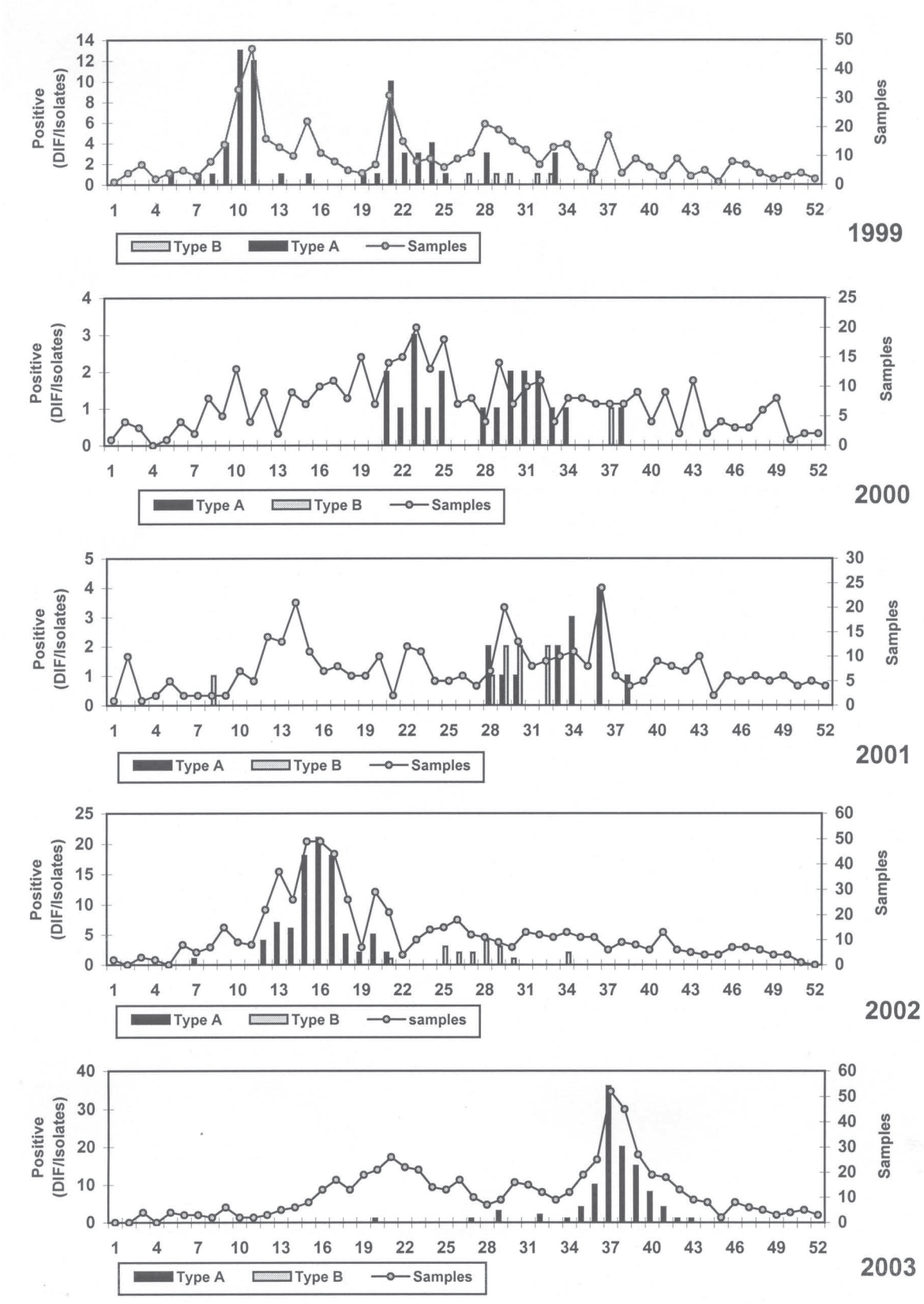
3.1.1 Influenza pandemic

Pandemics develop when there emerges a new influenza A virus subtype to which the world's population as a whole possesses little or no immunity, and when the virus is efficiently transmitted from one human to another, causing illness and even death. Pandemics occur infrequently (a few times per century) and at unpredictable intervals, but they can have devastating effects involving millions of deaths.

During the last century, influenza A viruses with a new haemagglutinin subtype arose and spread into the human population on three occasions resulting in global pandemics, namely "Spanish flu" (1918–1919) — affecting and killing 20–50 million people, "Asian flu" (1957) and "Hong Kong flu" (1968–1969).

In 1997 in Hong Kong, and in 2004 in Viet Nam and Thailand, H5N1 strains previously known to only infect birds were documented to infect and even kill humans. The virus did not, however, gain the ability for human–human transmission, a prerequisite for the evolution of a new pandemic strain. Considering the potential of the influenza A to mutate and undergo genetic reassortment, and the recent worldwide spread of the avian influenza epidemics in birds, the threat of a possible pandemic should be taken seriously; a global plan to avert, prevent or mitigate its occurrence should be aggressively addressed. (Guidelines for pandemic preparedness are in the second part of this document.)

Figure 1: Influenza virological surveillance data, New Caledonia. 1999–2003[20]



3.2 Source

The source of influenza outbreaks is usually difficult to determine, because the disease is highly contagious and infected people can transmit the virus before symptoms develop. It is not usually possible or effective to isolate the index case and their contacts. Travellers are likely sources of infection, especially if they are travelling from an outbreak area. Once an outbreak has begun, it will spread quickly; it can be assumed that the virus has been widely disseminated by this time and there is no public health benefit in attempting to identify the source. Molecular analysis of the virus may give some indication, retrospectively as to the likely source of the virus.

3.3 Occurrence

Influenza is the most important cause of severe respiratory illness. It affects people of all ages, both sexes, and all ethnicities worldwide. Influenza is usually a seasonal disease, but the virus is in circulation at all times of the year somewhere in the world.

Outbreaks and epidemics of influenza occur in most regions every year. In temperate zones, influenza tends to occur around the winter period. In the Northern Hemisphere, peak activity is usually between December and March; in the Southern Hemisphere, between June and September. In tropical regions, outbreaks seem to develop most often during the rainy season.

These seasonal variations are probably due to the fact that transmission of the influenza virus takes place most easily when people are crowded together indoors during cooler, wetter periods. In the Pacific, the annual incidence of influenza varies according to geographic location, travel patterns of tourists and citizens (from areas where influenza is circulating) and climatic conditions. For example, the peak incidence of influenza in Papua New Guinea is usually June to August, while in New Caledonia there is a main peak in February/March with smaller peaks between May/June and September. In other tropical countries, for example, Singapore, influenza has been isolated at some level throughout the whole of the year.

3.4 Aetiological agent

Influenza viruses are classified according to types, subtypes and strains. Influenza type A and influenza type B are responsible for epidemics, while influenza type C infections cause mild respiratory illness and are not thought to be of epidemiological significance. There are distinct subtypes of influenza A.

Influenza A and B viruses are only distantly related. The different subtypes of influenza A differ primarily with respect to their surface proteins (haemagglutinin and neuraminidase) but otherwise are closely related. For influenza A, 15 distinct types of haemagglutinin have been recognized and nine distinct types of neuraminidases; these are the basis of their subtyping. They occur in various combinations.

Influenza A viruses can be also be found in a number of different species, but aquatic birds appear to be the primary host. Viruses containing only three of the 15 haemagglutinin subtypes and three of the nine neuraminidase antigens are known to have resulted in widespread outbreaks in humans, whilst all of the haemagglutinin and neuraminidase types can be found in birds.

Currently the types of influenza circulating in humans are the influenza A subtypes A(H1N1), A(H1N2), A(H3N2) and influenza B. The proportion of each of these viruses responsible for disease can vary widely from year to year.

To date, ALL major human outbreaks associated with high numbers of deaths have been due to influenza A viruses.

Influenza viruses undergo two forms of antigenic variation. The gradual ongoing change is a process known as "antigenic drift". A rarer event which produces profound changes in the influenza virus is known as "antigenic shift". Both influenza A and B undergo antigenic drift, but only influenza A displays antigenic shift. It is the unique genetic structure of the virus genome which is responsible for the two types of variation.

Antigenic drift – The replication of single-stranded RNA, which makes up the genetic material of influenza viruses is particularly error-prone, giving the virus a high rate of mutation. As less immunity against a mutated strain allows a better circulation of the virus, mutations in the surface antigens are selected by population immunity, resulting in the continuing relatively gradual evolution of new strains favoured by an increased susceptibility of the population.

Antigenic shift – The segmented genome of influenza allows reassortment between the genetic segments from influenza viruses when a host is infected with two different viruses. As this reassortment process may result in the creation of a novel strain of influenza transmissible between people and to which the human population may not have been exposed previously, outbreaks involving this type of virus can be very serious. These strains of influenza, although rare, are potentially pandemic strains and may cause widespread outbreaks and high levels of mortality, such as has been seen in 1918, 1957 and 1968.

3.5 Infectious dose

The human infectious dose will vary with the immune status of the individual (i.e. whether they have been exposed to that particular virus strain before and how long ago) and the type of influenza virus. A range 100–1000 TCID50 (tissue culture infective dose 50%) of several influenza A strains has been shown to result in human infections in at least 50% of test subjects, while 10^7 TCID50 led to 100% of people becoming infected. Delivering virus by droplets in an aerosol form may reduce the infectious dose required.

3.6 Mode of transmission

Influenza is spread or transmitted when a person who has influenza coughs, sneezes, or speaks and creates influenza-virus-infected droplets or aerosols which other people inhale. The virus enters someone's nose, throat, or lungs, first multiplies in the upper respiratory tract and may spread to the lower respiratory tract, and occasionally to other parts of the body, leading to the symptoms of influenza. Influenza may, less often, be spread by direct contact with contaminated surfaces, especially as viruses may survive for hours in dry and cold conditions, e.g. when a person with influenza touches their nose or mouth and then touches a surface (for example, a door handle), then another person touches the same surface and then their nose or mouth.

3.7 Period of communicability and incubation period

Influenza virus shedding can be detected shortly before the onset of illness, usually within 24 hours post exposure, and rises to a peak shortly after (10^3–10^7 TCID50/ml of nasopharyngeal wash), and remains elevated for 24–72 hours, falling to low levels by day 5 post exposure. In children, shedding may be significantly prolonged and viral titres higher. In immunocompromised patients with influenza, viral shedding can persist for extended periods of time.

The incubation period of influenza ranges from 1–5 days but is commonly 1–3 days.

3.8 Vulnerable population/subgroups

Anyone can contract influenza, even healthy people, and while most people will recover uneventfully in 1–2 weeks, serious problems resulting from influenza can occur at any age.

The possible exception to this is people who have been vaccinated with a strain of influenza that is well matched to the circulating strain and which they have responded to adequately. Protection against influenza by vaccination may wane after 6–12 months. Most people who get influenza will recover in one to two weeks, but some people may go on to develop life-threatening complications (such as pneumonia) as a result of the influenza.

People aged 65 years and older, people of any age with chronic medical conditions and very young children are more likely to suffer complications from influenza. Pneumonia and bronchitis can occur as complications of influenza, and infection can cause a worsening of chronic health problems. These include chronic airways diseases (bronchiectasis, cystic fibrosis, emphysema), cardiac conditions (congenital heart disease, coronary artery disease, congestive heart disease), diabetes, metabolic diseases, renal failure, haemaglobinopathies, immunosuppression and immune deficiency (HIV, malignancy, chronic steroid use). Malnourished individuals are at increased risk of severe infection, children on aspirin therapy are at increased risk of developing Reye's syndrome and women in the second and third trimester of pregnancy are at increased risk of hospitalization. Residents of nursing homes and other long-term care institutions are also considered to be at increased risk.

3.9 Risk in the Pacific

The shorter periods of cooler months may put PICTs at a lower risk of influenza outbreaks. Nevertheless, with the ease of international travel, all areas are potentially vulnerable to outbreaks of influenza imported from the Northern or Southern Hemisphere winters, or to a novel pandemic strain of influenza, which may occur anywhere, although it classically starts in China or Southeast Asia. When outbreaks do occur, they might be more severe because:

- PICTs' populations are ageing with more chronic medical conditions (NCD), known risk factors for severe influenza;
- potentially longer periods of nonexposure to influenza may also leave certain Pacific Island communities with low levels of immunity to influenza;
- the remoteness of many health-care facilities and lack of basic medical services in many places poses a definite risk of serious outbreaks of influenza;
- there is a low level of vaccine usage due to lack of funds.

This was exemplified in recent outbreaks in remote regions in Madagascar and the Congo in 2002 and demonstrated that, where medical facilities are limited, combined with a state of malnourishment, higher than expected fatalities can occur. High attack rates (60–70%) and high case fatality rates were seen in particular communities in these outbreaks. Normally the case fatality rate for influenza is low (around 0.1% or one per thousand) and deaths occur mainly in the elderly, but in these outbreaks the case fatality rate was 30–40 times higher and deaths were seen in the elderly and the young.

4. ROUTINE SURVEILLANCE

4.1 Rationale for influenza surveillance

Local periods of circulation:

- Follow-up of influenza circulation in the PICTs is necessary to determine the periods of highest incidence during the year, in order to adjust the timing of local vaccine policies.
- Early identification of influenza outbreaks is also important and needs to be regionally reported in a timely manner (to WHO and on PacNet), so that the neighbouring countries can implement an appropriate response, such as a one-off immunization campaign targeted on risk groups if a yearly vaccination is not routinely done.

Participation in the world surveillance:

- Circulating strains of influenza virus are of high interest to the WHO Collaborating Laboratory Centre for Influenza Research (Melbourne, for the Pacific region). Their characterization is needed for annual updates of influenza vaccine as well as for the detection of new types or subtypes potentially responsible for the next pandemic.
- Where there are laboratory facilities in PICTs that perform virus isolation, they should send isolates to a WHO Collaborating Laboratory Centre for Influenza Research (WHO-CC). If possible, in addition labs should either send some of the original clinical sample or retain it as this is the starting material for a new vaccine strain (the tissue culture isolate is not acceptable for vaccine production). If samples are kept (preferably at –70°C) and no request has been made for these samples by the WHO Centre after six months, they can be discarded.

4.2 Surveillance case definitions

4.2.1 Clinical case definition: influenza-like illness (ILI)

- Minimum criteria:
  sudden onset of fever >38°C
  AND cough OR sore throat
  AND myalgia
  in the absence of other diagnoses.
- Frequently associated symptoms: headache, tiredness and runny nose.
- Complicated presentations: in addition to the above presentation, there may be viral pneumonia (rare), secondary bacterial pneumonia or other serious complications that may eventually lead to death, especially in patients belonging to high-risk groups.

4.2.2 Laboratory-confirmed cases

The presence of the influenza virus can be detected in nasal samples taken up to the fourth or fifth day of onset by:

- direct antigen detection using an immunofluorescence technique or rapid tests, mainly based on type-specific immunochromatography
- isolation in cell lines such as MDCK
- viral gene amplification (RT-PCR).

Serology is not routinely used for diagnostic purposes as paired sera are required and the presence of residual post-infection or vaccination antibodies may make interpretation difficult.

4.2.3 Proposed case classification

- Suspect case: a case that meets the clinical definition.
- Confirmed case: suspect case with laboratory confirmation.

4.3 Recommended surveillance systems[2,9]

It is highly recommended that existing in-country surveillance systems be reviewed by the health authority in collaboration with EpiNet response teams to identify the best way to incorporate an influenza surveillance component into them.

4.3.1 Syndromic surveillance system

Passive surveillance:

- Routine weekly, or as indicated, reporting of influenza-like illnesses (ILI) by health professionals allows quick identification of the emergence of any outbreak of acute respiratory infection. For example, ILI can be included in the list of diseases contained in the notifiable disease notification form which is regularly and routinely channelled from the peripheral centres/clinics and district hospitals to the central health authority.
- As other respiratory viruses (such as RSV — respiratory syncytial virus, adenovirus, parainfluenza, metapneumovirus, etc.) can be involved in these situations, this system has a good level of sensitivity but a low level of specificity.
- Although passive ILI reporting can be often irregular and delayed, a review mechanism by the EpiNet response teams to improve on this issue should be in place.
- Other passive indicators can be recorded, such as absenteeism from school and workplaces.

Active surveillance:

- As passive ILI reporting is often irregular and delayed, it is recommended to have a sentinel network of volunteer practitioners implemented.
- Sentinel sites must be representative of the main health facilities: general practitioners, dispensaries and hospitals, especially paediatric wards as ILI is a frequent cause of hospitalization of children and babies.
- Reporting should be done throughout the year, even in the absence of visible outbreaks ("0 reporting"). This aims at obtaining an activity baseline and allows the determination of local thresholds.
- Reporting can be done either in terms of absolute number of consultations for ILI or as a proportion of the total number of patients seen during the period. The latter method of reporting is more specific and has been chosen in some countries (e.g. most surveillance networks in Australia or GROG networks in France).
- Specific data sheets should be used by sentinel clinicians for monitoring and recording ILI and for lab requests if applicable. Templates for such a form are presented in Annexes 1A (English) and 1B (French).
- EpiNet focal teams should be pivotal in informing and planning with Ministry of Health on these surveillance issues.

4.3.2 Laboratory-based surveillance

- As diagnosis of influenza is usually based only on clinical features, it is not common to require any laboratory testing during the management of an influenza case.
- Where influenza-specific laboratory facilities are available, patients recruited by the sentinel network should be systematically tested.
- Laboratory strategy must include direct detection as a first step in order to provide an immediate confirmation. This is particularly important at the beginning of an outbreak (index cases).
- Virus isolation, as it is a time-consuming procedure giving a delayed result, should be performed only on samples with a positive direct examination to confirm virus identification.
- Specimens should be taken and preferably tested at the national laboratory (L1). But if laboratory testing is not available at a national laboratory, specimens should be sent to the PPHSN referral laboratory (L2), or to the WHO-CC laboratory (L3) in Melbourne for the Pacific region, or as the nation decides (see Annex 2).
- The specimens are best taken within the first three days from when the first symptoms of ILI were recognized. They may be the ones with the best chance of yielding good results. They should also be transported in accord with the recommended guidelines for transporting clinical specimens under IATA regulations.

Note: In exceptional situations, such as the start of an influenza pandemic or if there is a re-emergence of SARS, it is recommended that all PICTs have access to basic rapid influenza testing using, if possible, kits provided by WHO.

4.4 Reporting procedure

- **Periodicity**: The weekly reports, or as indicated, should be collected by the central level of the Ministry or Department of Health, and in collaboration with EpiNet response teams for the country. Also, grouped clinical cases or the first laboratory-confirmed case should be immediately reported, as this could signal the beginning of an outbreak.

- **Data collected** should include at least the following:
  – epidemiological case context: sporadic or multiple cases, age and place of residence;
  – symptoms, mainly in clinical presentations; and
  – vaccination history.

- **Information dissemination**
  When an outbreak is confirmed, the health authorities should inform health professionals and the public through the usual accepted channels of communications on the outbreak, the opportunity of vaccination (mass campaign, targeted campaign, and catch-up programme or voluntary immunization) and the treatment.

  Routine awareness programme on basic health measures for people to be aware of and to follow should be initiated and conducted as widely as possible, using the best multimedia coverage. **Reporting** should be regionally done on PacNet and to the WHO-WPR office, as well as to FluNet for wider international notification.

5. PREVENTION OF INFLUENZA: MITIGATION OF AN EPIDEMIC

In order to prevent influenza from having a severe impact on the population, there are procedures and logistics that need to be in place. These include appropriate and functional surveillance systems, available vaccines, antiviral therapy, and a feasible contingency plan.

5.1 Surveillance and public health interventions

Surveillance, using different methodology/tools, is required to determine the intensity and impact of influenza activity; to identify the high-risk populations; to identify when, where and which influenza viruses are circulating; and to detect unusual events, such as infection by unusual influenza viruses, unusual syndromes caused by influenza viruses, and unusually large and severe outbreaks.

The impact of influenza can be mitigated if good surveillance systems, as described above, are in place. Relevant public health interventions will accordingly be planned as preparedness tools. However, community awareness of influenza infection and its complications should be part of any routine health awareness programme. The frequency of this programme, with messages whose content is tailored appropriately, should be scaled up when there is evidence of influenza, including evidence of Highly Pathogenic Avian Influenza (HPAI) outbreaks in the country or the region.

5.2 Vaccination

It is understood that the best use of vaccines is in prevention rather than during an epidemic, except in smaller outbreaks such as those in an institution. Also, the challenge of timely production of vaccines against the specific circulating strains is enormous. While you might have some advance knowledge of an outbreak in a neighbouring island, often you will not know until an influenza epidemic occurs regionally.

The seasonality of influenza infection does not really apply to PICTs. However, influenza transmitted by visitors from the Northern or Southern Hemisphere causes outbreaks in our countries. Thus, the vaccine combination as recommended by WHO for the Southern Hemisphere or the Northern Hemisphere (Annex 3) can be used in immunization practice, according to the local epidemiological information and travel patterns from affected countries.

In most developed countries, vaccines are recommended to be given annually, especially to vulnerable groups of people. National EpiNet teams should monitor WHO recommendations for vaccination and decide on appropriate policies and strategies for vaccinating the groups most at risk.

The initial targets for vaccination are:

1. individuals at increased risk for serious complications from influenza:
   - individuals over 60 years of age[3]
   - residents of nursing homes and other long-term care facilities that house persons of any age with long-term illnesses
   - adults and children >6 months of age who have chronic heart or lung conditions, including asthma
   - adults and children >6 months of age who have metabolic diseases (especially diabetes), chronic kidney disease, or a weakened immune system (including malignancy and infection with HIV/AIDS)

2. groups capable of transmitting influenza to high-risk groups:
   - health-care workers
   - other employees of health-care and long-term-care facilities
   - family and other household members (including children) of people in high-risk groups.

Because young, otherwise healthy, children are also at increased risk for influenza-related complications requiring hospitalization, vaccination of healthy children aged 6–23 months should also be considered if sufficient stocks of vaccine are available.

People who provide essential community services (e.g. police, firefighters, etc.) may be considered for vaccination to minimise disruption of those services during an outbreak. Students and others in institutional settings (especially those who live in dormitories) should also be considered for vaccination.

Contraindications to influenza vaccination include severe allergy to hen's eggs and history of a previous severe reaction to influenza vaccine including Guillain-Barré syndrome (GBS) within six weeks following a dose of influenza vaccine.

The administration of pneumococcal polysaccharide vaccines (23-valent type) along with influenza vaccines, especially in the elderly, has reduced the complications and mortality associated with pneumonia. This is an option for consideration by countries and territories with good information on the burden of influenza illness, especially in the elderly (>65 years) age groups.

5.3 Antiviral therapy

Antiviral drugs can be used before the person is exposed to influenza virus, during exposure and after being ill with influenza, while vaccines can only be used during pre-exposure and exposure status.

They are the M2-ion channel inhibitors (amantidine and rimantidine), neuraminidase inhibitors (zanamivir and oseltamivir), and others not as yet registered (e.g. ribavirin). The neuraminidase inhibitors are better as they are effective on both influenza virus A and B and have fewer side effects, but they are quite expensive in comparison to the M2-ion channel inhibitors. (More on antivirals is presented with the influenza pandemic preparedness guidelines. See also 7.3.)

3. People >50 years of age who have chronic (long-term) medical conditions are at a higher risk for serious complications from influenza. In the Pacific, it is thought that approximately not less than 40% of this age group have high-risk conditions, which are often undiagnosed.

6. RESPONSE TO INFLUENZA EPIDEMICS

The following responses are undertaken simultaneously.

6.1 Initial action and responsibilities

In order to recognize an increased activity in the zone, a good surveillance system should be in place. The baseline ILI activity may be different from country or territory to country or territory. It is best to figure out the baseline activity from daily ILI consultation, rather than monthly, as the latter data would be too crude.

Also, the clinicians or health-care workers should have a high suspicion of a possible influenza outbreak if there is evidence of increased number of clinically suspected ILI presented for consultation or unexplained deaths due to ILI symptoms.

6.1.1 Confirmation of outbreak

If national surveillance detects an increased incidence of influenza-like illness (ILI) in the community, appropriate specimens from representative cases must be sent to a national laboratory (L1) for rapid testing (if available), or to PPHSN L2 or L3 laboratory for testing, confirmation and subtyping of the virus. This should be regarded as a matter of urgency.

Simultaneously, the suspicion of a significant outbreak of ILI in the community is sufficient reason to call an emergency meeting of the national EpiNet (or equivalent multisectoral) team. This team should be pivotal in assessing the outbreak and formulation of the appropriate response.

Syndromic surveillance linking peripheral health-care settings to the central health authority or similar central body should be immediately established so that a daily tally or statistics for clinically suspected ILI, ILI hospitalizations and ILI deaths are monitored. This exercise should provide guidance to the national or health authority on the magnitude and severity of the epidemic, and the evaluation of the responses.

6.2 Response to a confirmed influenza pandemic

6.2.1 Epidemiological investigation

In general, outbreak control measures are limited by the speed with which influenza viruses spread between countries and within the community. Immediate epidemiological investigations in an influenza outbreak are therefore not useful in most circumstances and may divert time and resources from more essential activity.

Contact tracing is rarely necessary unless contacts are members of higher risk groups. Contacts of compatible cases should remain alert for symptoms of ILI and be advised of treatment measures and the indications for seeking medical attention.

Unusual events such as high case fatality rates despite vaccination, or the clustering of cases with typical flu-like symptoms, or adverse reactions to vaccination if carried out before the outbreak would need proper investigation.

6.2.2 Surveillance and reporting

A mechanism should be established for clinical or syndromic reporting of ILI in accordance with the agreed influenza clinical case definitions.

A line list of cases by category should be created and maintained, and developing a spot map should be considered. If the outbreak is relatively contained, there will be time to search for and isolate a possible source (e.g. institutional, travellers, health-care settings).

Available clinical data on age-specific attack rates and complications, and outcomes of influenza in special risk groups (e.g. pregnant women, babies under two years and others as identified in research priorities) need to be collected, collated and analysed. If necessary, population groups need to be reprioritized for possible vaccination.

Also, systems for external (international) reporting and communication have to be activated, including international surveillance (PPHSN and WHO), the media, avenues for donor support (development partners, technical support agencies, etc), and coordination among agencies.

6.2.3 Vaccination

Vaccination can be offered during the epidemic mainly to those people in the category of at risk but it is best to give before the epidemic occurs, even before a pandemic arrives. See also 5.2.

6.2.4 Antivirals

See Sections 5.3 and 7.3, as well as the pandemic preparedness guidelines.

6.2.5 Communication with clinicians

Systems of communications between the EpiNet (or equivalent) team and clinicians need to be established by means of existing mechanisms. The level and frequency of communication will be guided by the existing influenza scenarios. Monitoring of an outbreak should be a collaborative effort between the relevant stakeholders in the country, e.g. Ministry of Health, Department of Education (including both government and nongovernment), the legal department, community leaders, to name a few.

Any supplementary staff training would depend on the interventions decided upon by the national EpiNet (or equivalent) team. The focus of the training will be dictated by the type of intervention activities decided upon by the national authority. For example: if antiviral or symptomatic treatment of influenza cases is to be the major intervention strategy, then training should focus on this. If vaccination is to be offered as the primary public health intervention, then this should be the main focus of training. And note that this is a golden opportunity to provide other related information at this time, e.g. update on the state of the outbreak, instructions for simple management of cases at home, and instructions on when to refer patients to the next level of care.

It is important to emphasise that surveillance, including influenza surveillance, should be part of training curriculum for all preservice trainees in the PICTs. Clinical staff should be assisted to implement the ILI surveillance system.

6.2.6 Communication with the public

At the national level, information on influenza should be a part of the routine health awareness programmes on the control and prevention of infectious diseases. When there is an influenza outbreak in an identified zone, there should be confirmation of the cause of the outbreak, using the surveillance described earlier in these guidelines. The public should be then informed of the situation, to alleviate fear and to plan and share appropriate response, including information on the nature of the disease, its geographical spread, who are the vulnerable groups, and other control and preventative measures. The public should be informed on the services that the country can offer and how to access them, including the latest information regarding the outbreak.

Information, education and communication (IEC) for the public should focus on prevention and treatment measures and the indications for seeking medical care services. Key education messages include:

- signs and symptoms of influenza;
- if vaccination is available, the importance of early vaccination and information on eligibility and how and where to be vaccinated;
- guidance on symptomatic case management at home for uncomplicated cases;
- guidance on the signs of major complications of influenza (especially pneumonia) and the importance of seeking appropriate treatment quickly; and
- tailored information for the elderly, those with chronic condition(s) and their carers, and the parents of very young children.

6.2.7 Travel restrictions

While influenza is a highly contagious disease, travel restrictions are not recommended, as it is unlikely that they would be effective. If travel is unavoidable, especially for those who are in the vulnerable subgroups, influenza vaccination, if it is available (or possibly prophylactic use of influenza antiviral drugs) should be recommended as part of medical preparation before travel.

7. CLINICAL CASE MANAGEMENT

7.1 Diagnosis

The onset of influenza is characteristically abrupt, and its diagnosis is based primarily on clinical symptoms referred to as "influenza-like illness" (ILI). These symptoms have been described in Section 2, Description of the disease, earlier in this document.

Not all patients diagnosed with "influenza" on clinical grounds are truly suffering from an influenza virus, because the symptoms are often difficult to distinguish from those caused by other respiratory viruses (e.g. respiratory syncytial virus, coronavirus, rhinovirus, and other causes of the "common cold") and others like malaria (in/from malarial endemic zones), dengue fever and other acute febrile illnesses. The accuracy of clinical diagnosis is improved when the presence of influenza virus in a community has been confirmed by laboratory testing and health-care workers are aware that influenza virus is circulating.[4]

"Point-of-care" rapid diagnostic tests may be useful for epidemiological surveillance (e.g. in sentinel clinics) but they are not cost-effective for routine clinical diagnosis in primary care settings.

7.2 Treatment

Virus infections such as influenza are normally cleared by the body's immune system, and most patients recover without complications.

Treatment is symptomatic, and includes rest, high fluid intake, and paracetamol and decongestants to lower fever and ease pain and headache. Patients should consult a health worker if symptoms change or become worse.

The most common complications of influenza are pneumonia, otitis media, acute sinusitis and tracheobronchitis. Of these, pneumonia is potentially the most serious, but, if it is treated with appropriate antibiotics, the case fatality rate can be markedly reduced.

7.3 Antiviral drug: treatment and prophylaxis

Numerous antiviral agents are now available to treat influenza. Amantadine (Symmetrel®) and rimantadine (Flumadine®; note that this drug may not be widely available) are active against influenza A but not influenza B. The newer, more expensive neuraminidase inhibitors, zanamivir (Relenza®) and oseltamivir (Tamiflu®), are active against both influenza A and B viruses. When treatment is started within two days of symptom onset, they can limit the severity and duration of the disease and reduce viral shedding.

4. During an influenza epidemic, cough and fever (temperature >38°C) has a positive predictive value of 86.8%, a negative predictive value of 39.3%, a sensitivity of 77.6%, and a specificity of 55%. The higher the fever, the stronger the positive predictive value; the presence of myalgia and a sore throat do not significantly improve the positive predictive value.

Antiviral agents can prevent influenza if taken following exposure but prior to onset of symptoms. If taken after infection has set in, that is, within two days of illness, an antiviral may reduce the duration of the symptoms by one or two days. Therefore, they are potentially useful in unvaccinated high-risk individuals or in outbreaks involving numbers of high-risk individuals, e.g. outbreaks in aged care facilities and in boarding schools.

Some of these antiviral drugs, especially the newer ones, oseltamivir and zanamivir, happen to be of limited use in PICTs. The national EpiNet teams should assist clinicians on the decisions on the use of antiviral drugs based on country capacity and financial resources**. Influenza vaccination would normally take priority over purchasing of antiviral drugs**, but depending on available resources of countries, both of them have a specific role to play in the control and prevention of influenza.

7.4 Indications for hospitalization

Hospital admission is indicated if symptoms of more severe complications of influenza are present. The most common reason for hospitalization is pneumonia. Less common complications needing hospitalization include encephalitis, Guillain-Barré syndrome, pericarditis, transverse myelitis, Reye's syndrome, and myositis.

If serious alternative diagnoses are suspected (e.g. malaria, complicated dengue, leptospirosis, typhoid), consider admission or referral to a higher level health facility.

7.5 Isolation, sanitation and hygiene

True influenza spreads rapidly through a community and, in isolation, quarantine, sanitation and hygiene have little effect on transmission dynamics.

The period when an infected person can transmit influenza depends on their age. Adults may be contagious from one day prior to the onset of symptoms to 3–5 days afterwards. Children may be contagious for longer than a week.

The best way for health workers to help prevent the spread of influenza and treat it more effectively is by tracking epidemiological data, knowing the presenting symptoms of this illness, making the correct diagnosis, initiating treatment promptly, and remaining alert for potential complications.

REFERENCES AND FURTHER SOURCES OF INFORMATION

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ANNEX 1A: Proposed declaration form (English version)

PPHSN

Influenza Surveillance Network

Transmission form for influenza testing
to be transmitted by the lab to MoH/DoH

TO BE COMPLETED BY THE CLINICIAN:

Report from Dr:

1. Name:……Address:……
2. Tel.:…… email address:……

Patient ID:

1. Last Name:…… ……..First Name:……
2. D.O.B.: ……/……/…… (d/m/y) Sex : F ☐ M ☐
3. Address:……

Epidemiological context:

1. Sporadic case ☐ Familial outbreak ☐ Other (specify):……..
2. Not vaccinated against flu ☐ Vaccinated ☐ Date of last vaccine:…/…/……(d/m/y)
3. Recent travel: No ☐ Yes ☐ Specify (where & when):……

Clinical features :

1. First day of illness: ……/……/……(d/m/y)
2. Symptoms recorded:

Fever	☐	Highest Temp.: …….°C		Runny nose	☐
Sudden onset	☐	Tiredness	☐	Muscle pain	☐
Cough	☐	Headache	☐	Sore throat	☐

Other symptoms (specify):……..

Biological samples collected (or prescribed):

1. Sample date: ……/……/……. (d/m/y)
2. Nature of sample: Nasal swab (recommended) ☐
   Pharyngeal swab ☐
   Nasal aspirate ☐
   Other (specify):……

TO BE COMPLETED BY THE LABORATORY:

Lab investigation:

Rapid test ☐ IFA* direct examination ☐ …… Isolation ☐ ……
(* IFA: Indirect Immunofluorescent Antibody Test)

NEGATIVE	FLU A	FLU B	Para Inf 3	RSV
Referred	H1N1	H3N2	Other:	

Lab conclusion:

ANNEX 1B: Proposed declaration form (French version)

ROSSP

Réseau Sentinelle GRIPPE

Fiche de renseignements à joindre aux prélèvements puis à transmettre au Département de la Santé

PARTIE À REMPLIR PAR LE MÉDECIN SENTINELLE :

Identification du Prescripteur :

1. Nom :.....Adresse :.....
2. Téléphone :.....Mèl :.....

Identification du Patient :

1. Nom :.....Prénom :.....
2. Date de Naissance : ...../...../..... Sexe : F ☐ M ☐
3. Adresse complète : .....

Contexte épidémiologique :

1. Cas isolé ☐ Epidémie familiale ☐ Autre (précisez) : .....
2. Non vacciné contre la grippe ☐ Vacciné ☐ Date de la dernière injection:..../.../....
3. Voyage récent à l'étranger : Non ☐ Oui ☐ Lieu/date de retour.....

Clinique :

1. Date d'apparition des signes cliniques :...../...../.....
2. Signes présents :

Fièvre	☐	T° max. :.....°C		Rhinite	☐
Début brutal	☐	Asthénie	☐	Courbatures, myalgies	☐
Toux	☐	Céphalées	☐	Pharyngite	☐

Autres symptômes (à préciser) :.....

Prélèvements effectués (ou à faire) :

1. Date du prélèvement : ...../...../.....
2. Nature du prélèvement : Écouvillonnage nasal ☐
   Prélèvement pharyngé ☐
   Aspiration nasale ☐
   Autre (préciser) :.....

PARTIE À REMPLIR PAR LE LABORATOIRE :

Analyses réalisées :

Test rapide ☐ Examen direct (IFA) ☐ ..... Isolement ☐ .....

(* IFA: Indirect Immunofluorescent Antibody Test)

NEGATIF	GA	GB	Para 3	VRS
Envoyé	H1N1	H3N2	Autre :	

Conclusion LABO :

ANNEX 2: WHO reference laboratories for diagnosis of influenza and A/H5 infection

WHO Collaborating Centre for Reference and Research on Influenza
45 Poplar Road, Parkville.
Victoria, Australia 3052
Phone +61 3 9389 1761
Fax + 61 3 9389 1881
http://www.influenzacentre.org

WHO Collaborating Centre for Reference and Research on Influenza
National Institute of Infectious Diseases
Gakuen 4-7-1, Musashi-Murayama
Tokyo 208-0011
Japan
Fax: +81 42 5610812 or +81 42 5652498

WHO Collaborating Center for Surveillance, Epidemiology and Control of Influenza
Centers for Disease Control and Prevention
1600 Clifton Road, Mail Stop G16
Atlanta, GA 30333
United States of America
Fax: +1 404 639 23 34

WHO Collaborating Centre for Reference and Research on Influenza
National Institute for Medical Research
The Ridgeway
Mill Hill
London NW7 1AA
United Kingdom
Fax: +44 208 906.4477

WHO Collaborating Center for Studies on the Ecology of Influenza in Animals
Virology Division
Department of Infectious Disease
St. Jude Children's Research Hospital
332 North Lauderdale St.
Memphis, TN 38105-2794
United States of America
Fax: +1 901 523 2622

National Influenza Centre
Government Virus Unit
382 Nam Cheong Street
Shek Kip Mei
Kowloon
Hong Kong Special Administrative Region of China
Fax: +852 2319 5989

Department of Microbiology
Faculty of Medicine
University of Hong Kong
University Pathology Building
Queen Mary Hospital
Hong Kong Special Administrative Region of China
Fax: + 852 2855 1241

Unité de Génétique Moléculaire des Virus Respiratoires
Institut Pasteur
25 rue du Docteur Roux
75724 Paris Cedex 15
France
Fax: +33 1 40 61 32 41

ANNEX 3: Advice on influenza vaccines

Refer to http://www.who.int/csr/disease/influenza/vaccinerecommendations1/en/
or http://www.spc.int/phs/PPHSN/Outbreak/Influenza_Vaccine.htm

ANNEX 4: PPHSN Influenza Specialist Group members

Chairperson: Dr Salanieta Saketa – National Epidemiologist, Ministry of Heath, Fiji Islands

Members:

Dr Hitoshi Oshitani, Regional Adviser, Communicable Disease Surveillance and Response, SARS Outbreak Preparedness Group, World Health Organization Western Pacific Regional Office, Manila, Philippines
Dr Tom Kiedrzynski, Epidemiologist, Secretariat of the Pacific Community, Noumea, New Caledonia
Dr Alain Berlioz-Arthaud, Pharmacist-biologist, IPNC, Noumea, New Caledonia
Dr Joe Koroivueta, Consultant Virologist, Ministry of Health, Fiji Islands
Dr Nuualofa Potoi, Director of Preventative Health Services, Ministry of Health, Samoa
Dr Ian Barr, World Health Organization Collaborating laboratory, Melbourne, Australia
Communicable Disease Medical Officer, World Health Organization, Office for the South Pacific, Suva, Fiji Islands
Dr Seini Kupu, Communicable Disease Control and Prevention, Ministry of Health, Tonga

Contact:
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PART II

GUIDELINES FOR INFLUENZA PANDEMIC PREPAREDNESS

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EXECUTIVE SUMMARY

It has been over 35 years since the last substantial pandemic of 1968 ("Hong Kong flu"). It is globally accepted that soon there may be another influenza pandemic, but no one can foretell when, how and where it is going to occur. As most PICTs are operating on shoestring budgets with limited natural resources, provision of essential services and their effective maintenance is already a big challenge. The coming threat or event of a pandemic is unimaginable. Thus, there is the utmost need to plan now to be better prepared if the real situation arises.

These guidelines have been prepared in consultation with the Influenza Specialist Group (ISG), whose members were elected by national EpiNet members during the 2003 Regional EpiNet meeting. The chapters are sequenced in a way that the information and the thinking are guided systematically to the how, what, who and when to develop a national pandemic preparedness guideline and contingency plan. Other specific issues may also be important, but dealing with them is not necessarily a prerequisite before developing the national pandemic preparedness guideline. One example would be an influenza disease burden analysis — though it is important at some stage to assess burden of influenza disease as baseline information to assist with planning of control and prevention of influenza and with advocacy for further support for the implementation of the guidelines.

As influenza is not recognized as a priority disease to PICTs, and good functional surveillance systems — including for influenza — are very limited, with only few territories having access to flu vaccines, this document contains more information on influenza and related issues than is contained in a usual guideline. This document can be used as reference guideline with a generic component on elements of contingency plan by pandemic phases. PPHSN has also produced guidelines for routine/normal influenza preparedness, as part one of the present document.

These influenza pandemic preparedness guidelines are to provide the national communicable disease control and prevention committee (CDCC), of which EpiNet teams are key core members, and its working partners and planners, the background knowledge of influenza, the epidemics and pandemics. A historical overview of the pandemics in the twentieth century, especially of the Spanish flu of 1918 which ravaged the world but was worst in the South Pacific, is provided to describe the terrible scenario of the past as a reminder that, if we don't want this to be repeated, we must get ourselves better prepared.

In recognition of the uniqueness and individuality of the 22 island members of PICTs, the emphasis of these guidelines is on general issues and processes, so that each country and territory can then tailor the guidelines to their respective local situations. However, in some issues or processes, examples of events and best practices in some of PICTs are presented to facilitate clarity: e.g. quarantining returning residents or anyone that visited an affected area and landed in the country before the incubation period of the disease is complete, and the necessity to have the legal framework in place before exercising authority in that respect. Other issues include the WHO case definition of influenza-like illness (ILI), which is not familiar nor used by many of the PICTs —though they may describe the same clinical case but refer to it by a different name, e.g. flu-like illness, viral illness or acute respiratory infection (ARI).

Routine flu vaccination seems to be the option for prevention or minimizing the full impact of routine influenza, though it is not accessible to most PICTs. It is anticipated that vaccine against the pandemic influenza strain, though it may not be available in the first 4–6 months of the first pandemic wave, stands as the best option to contain and minimize impact of the pandemic, supported by other sound nonpharmaceutical public health measures. Routine flu vaccine is also recommended during the pandemic period to avoid possible reassortment of pandemic strains with routine flu virus strains.

Other important health issues that need to be re-emphasised are basic good healthy diet and lifestyles, and control and prevention of chronic conditions like diabetes and cardiac conditions. These will facilitate better body resistance and decrease predisposition to risk of suffering, or even dying, from an influenza infection.

These guidelines do not offer "model national pandemic preparedness guidelines." Rather, they describe the main issues for pandemic preparedness, and the processes under the different phases of pandemic, e.g. surveillance during interpandemic, prepandemic and pandemic. Risk communication and other public health measures are handled in a similar manner. It is anticipated that CDCC and working partners can extract specific wordings from the document text and tabulate or slot these into their own contingency plans or guidelines as they consider appropriate.

In the last chapter, a matrix with elements for national contingency plan is provided as an example so that readers can adapt and adopt the parts they consider relevant to their own context. They contain some of the issues (surveillance, public health measures, legal and ethical issues, health-care service, other emergency services, communication, and other essential services) that need to be addressed at each pandemic phase and level. Each country or territory can modify this matrix as appropriate.

Lastly, these guidelines are intended to be an evolving, living document. The document has to be reviewed, not only every now and then as CDCC/MOH decides but, most importantly, after significant outbreaks or as indicated to the PPHSN and working partners. This is to ascertain that the guidelines continue to keep the changing situations in perspective, e.g. in avian flu outbreaks with emerging potential pandemic strains in relation to appropriate public health measures and so forth

Let us work to develop feasible national pandemic preparedness guidelines where everyone has some role to play in planning, implementation and follow-up.

WE ACT NOW!

Malo

Dr Seini Kupu
ADB consultant to the PPHSN

ACRONYMS

A&E	accident and emergency department
AHS	animal health services
AusAID	Australian Agency for International Development
CDC	Centers for Disease Control and Prevention
CLO	country liaison officer
DES	Department of Environment and Sanitation
EU	European Union
EWS	early warning systems
FAO	Food and Agriculture Organization
Flunet	influenza network
HCW	health-care workers
IHR	International Health Regulations
ILI	influenza-like illness
IEC	information, education and communication
ISG	Influenza Specialist Group
JICA	Japan International Cooperation Agency
MAFF	Ministry of Agriculture, Fisheries and Forestry
MMWR	Morbidity Mortality Weekly Report
MOA	memorandum of agreement
MOH	Ministry of Health
MOJ	Ministry of Justice
MOW	Ministry of Works
MP	Member of Parliament
CDCC	Communicable Disease Control and Prevention Committee
NGO	nongovernment organisation
NIC	National Influenza Centre
NZAID	New Zealand's International Aid and Development Agency
OIE	World Organisation for Animal Health
PICTs	Pacific Island countries and territories
PPHSN	Pacific Public Health Surveillance Network
PPHSN-CB	Pacific Public Health Surveillance Network Coordinating Body
SARS	severe acute respiratory syndrome
SPC	Secretariat of the Pacific Community
UNICEF	United Nations Childrens Fund
WHO	World Health Organization
WHO-CC	World Health Organization – Collaborating Centre for Reference and Research on Influenza
WHO-NIC	World Health Organization – National Influenza Centre
WHO/SP	World Health Organization – South Pacific
WPRO	World Health Organization Regional Office for the Western Pacific

1. BACKGROUND

1.1 Historical overview of influenza pandemics: Pacific perspective

Influenza, commonly referred to as just "flu", may be the oldest and/or the most common illness known to the human race. Hippocrates first described an influenza-like illness in 412 BC, and Hirsch recorded the first influenza-like outbreaks in 1173 AD.[1–3] Since the first well-described influenza pandemic in 1580, about 31 pandemic-like outbreaks have been recorded.[3]. In the twentieth century, there have been three substantial global pandemics: the "Spanish flu" (1918) by A(H1N1), "Asian flu" (1957) by A(H2N2), and "Hong Kong flu" (1968) by A(H3N2) and a benign pandemic of "Russian flu" (1977) by A(H1N1) (Annex 1). When the Spanish flu hit the globe in 1918, no one knew what organisms caused it. The human influenza virus was first isolated and identified in 1933, around the same time as the swine virus was isolated. The 1918 flu pandemic is the worst recorded, claiming more than 50 million people worldwide within 12 months. In mortality it is second only to that recorded for the Black Death Bubonic Plague from 1347–1351.[4–10]

Spanish flu has been referred to as the "Spanish lady', "la grippe'(France), "sand fly fever" (Italy), "Flanders Fieber" or "Blitzkatarrh" (Germany), and "three-day fever" (America). Its origin has been debated, but it was not Spain.[2,5,10,11] However, when it reached Spain, it recorded the highest number of deaths within the shortest period of time (in May 1918), and the "early affliction and large mortalities allegedly killed 8 million people."[4] Despite China being referred to as the "hypothetical epicentre" for influenza pandemics, Spanish flu claimed its first victims at Camp Funston, Kansas, USA, in March 1918.[9,10–12]

The pandemic occurred in three waves: the first was from May to July 1918 and was less virulent than the second wave. The second wave claimed most lives globally during September to December 1918. The third wave was February to April 1919, with not many deaths recorded compared to the previous waves. Spanish flu spread around the world in a space of few months "carried with great rapidity along ocean shipping lanes, by railways, rivers and road systems."[5,7,12–14] It left trails of sickness and deaths, more than ever recorded before, but "nowhere were its ravages more devastating than the South Pacific."[5]

1.2 The deadly voyage of SS Talune

On 12 October 1918, the SS *Niagara*, a Canadian-Australian Royal Mail liner, anchored in Auckland from Vancouver. This was two weeks before the departure of the SS *Talune*, a regular steamship to the South Pacific from Auckland. SS *Niagara* had on board a large number of sick passengers and crew, and others had died from influenza only days after leaving Vancouver. The "25 very serious ones" were admitted to Auckland Hospital, while "forty eight were left on board and isolated...."[15] Influenza was not a notifiable disease in 1918, and the ship could not be quarantined. This should not have been an excuse to ignore the Spanish flu, however, as it had already been affecting Europe, parts of Asia and the USA since May 1918, some four to five months earlier.[5,10–18].

On 30 October 1918, the SS *Talune* was passed to sail with a clean bill. The evidence showing that it was to leave "deaths and destruction in its wake" was "powerful."[5] The ship called at ports in Samoa, Fiji Islands, and later on Tonga and Nauru, carrying goods as well as influenza-stricken people already on board. On 7 November 1918, the vessel anchored in Apia, and "... within a matter of days influenza was rampant. Morbidity rates were generally estimated at over 90 percent. As a result social and economic life collapsed completely."[5] In less than two months, there were more than 7542 deaths, about 25% of Samoa's total population. This included 30% of adult men, 22% of adult women and 10% of all children in Samoa. This included 45% of matai and 20% of faipule.[5,10,11,13] The Sydney Daily Telegraph reported, "Troopers (relief efforts) with their motor-trucks are doing wonderful service day after day gathering up the dead, who are simply lifted out of their houses as they lie on their sleeping-mats. The mats are wrapped around them, and they are deposited in one great pit at Vaimea."[11] This scenario was an appalling one for the Pacific, and we must determine never to allow it to be repeated.

The death tolls in the other island countries and territories were not as high as that of Samoa, with 5% (9,000) of Fiji Islands' total population, 16% of Tonga's, and 6% of Nauru's.[5] The military transport ship *Logan* arrived in Guam from Manila late in October 1918, carrying influenza-affected passengers. Between 7 November and 9 December 1918, about 5% of Guam's total population died of influenza.[16] When Tahiti was hit by an influenza epidemic in 1943, claimed to have been brought in by steamer from USA, the Pacific Island Monthly (September 1943) referred to the Spanish flu of "1918 in Tahiti as the memorable and devastating influenza epidemic which took away one-fourth of the population."[17] The Tahitians argued that the Spanish flu was "under a false name" — it should have been called the "pneumonic plague" because of the seriousness of pneumonia complications that killed people by "drowning them in their own sputum." But because it was called influenza, it was not a notifiable disease and therefore did not require the boats or ships to be quarantined.[18]

Around the world, the major subgroup affected by the Spanish flu was generally the healthy young adult population of 20–50-year-olds. In the United States, the mortality rates for "15–34-year-olds at the time was more than 20 percent."[4] This was an unusual group pattern for influenza morbidity and mortality as this group generally has normal immune systems, in comparison to the commonly affected age-groups for influenza illness, young children and elderly people.[4,7,19,20]

1.3 The escape from the "Spanish lady"

American Samoa was spared the ravages of the 1918 Spanish flu pandemic due to "…the commendable foresight, inspired guesswork and individual initiative" of its governor, Navy Commander John Poyer. After reading the Press Wireless,[5] Poyer instituted a strict maritime quarantine policy which the natives supported by "mounting shore patrol to repulse fugitives from stricken islands nearby."[5]

Australia was minimally affected at the initial stages of the 1918 Spanish flu because of strict maritime quarantine measures. The epidemic of Spanish flu claimed 11,500 lives by the end of 1919 with 60% between 20–45 years of age,[12, 21] probably by transmission from New Zealand. Because Australia's maritime quarantine policy extended equally to outgoing ships, and its steamships were exclusively servicing the islands of the Gilbert and Ellice groups (now Kiribati and Tuvalu), New Hebrides (now Vanuatu), Norfolk and the Solomon Islands, these island countries were spared, too.[5]

American Samoa's naval government's strict maritime quarantine policy was criticized as draconian when permission was refused to offload mailbags from a Western Samoa ship. It is salutary that "sacrifice of individual liberty for the societal good" might be the answer for such times, during a substantial pandemic.[5]

1.4 The pandemic strains

The virus responsible for the 1918 Spanish flu is unlikely to be identified in its original form, but scientific researchers have sought to find some clues as to why that strain was so exceptionally virulent. The coexisting event of World War I with a high level of mobility and densely populated camps was likely to have further contributed to the disastrous mortality of the 1918 flu pandemic.

Virological evidence suggests that humans were infected by A(H1N1) as early as 1908. Many research scientists argued that acquiring more information on the 1918 pandemic A(H1N1) strain may assist in our preparedness for any upcoming pandemics. Blood samples taken from survivors of the 1918 flu pandemic were examined in the 1930s. It was found that human antibodies matched those viruses from the pigs and not the human ones of that same period (1930s). These findings were further supported by researchers of later years, who "...confirm that the haemagglutinin-sequences looks more like the 1930s swine's, than it does to human haemaggluitinin sequences of the period."[6,20–22]Thus, it seems that the 1918 virulent virus was a recombinant virus that had some human-adapted influenza virus, combined with virus in pigs or from an avian source. This turned into the killer virus against which the population of the world did not have immunity.[20–25]

The influenza pandemic strains of the 1957 and 1968 pandemics were recombinants or genetic reassortment between animals and humans, with genetic mixing between avian and human influenza viruses with an intermediate species, such as domestic pigs. This created a new pandemic strain. (More detail is given in the next chapter.) Similar agricultural practices in Asia of keeping mixed farms of pigs, chickens or ducks around the same compound as human dwellings are seen practised in the Pacific, and this can be a high risk for the reassortment process to occur.

In view of the avian flu epidemics in the Asian countries where viruses had been documented as infecting and killing humans (Hong Kong 1997, Thailand and Viet Nam 2003–2004), the likelihood of a human influenza pandemic may be increasingly imminent. Asian and Pacific countries, especially those with ongoing avian influenza, need to work earnestly in collaboration with global health organizations like WHO, FAO and OIE to arrest these events, and to protect their people, especially chicken farmers and cullers.

It has been more than 35 years since the last global pandemic, and susceptibility to a pandemic event may be considerable in current populations. Though no one knows exactly when pandemic is going to occur, evidence to date shows that we should be better prepared now than we were in the twentieth century. We have access now to flu vaccines, worldwide collaborative surveillance system, high scientific research and virology laboratory capacity, and fast and better means of communication worldwide and nationally. It is therefore necessary to plan for better preparedness, and the urgency to do so cannot be overemphasized.

2. EPIDEMIOLOGY OF INFLUENZA

Since 1889, there have been three human influenza A subtypes H1, H2 and H3 which have appeared cyclically: 1898 – H2; 1900 – H3; 1918 – H1N1 (Spanish flu); 1957 – H2N2 (Asian flu); 1968 – H3N2 (Hong Kong flu) and 1977 – H1N1 (Russian flu).[1,7] If the above cycle continues, there have been 35 years since the last pandemic; thus, there are enough susceptible people to facilitate the transmissions of a new, novel strain if it arises. However, avian flu outbreaks throughout the world since 1997 confirm that H5, H7 and H9 subtypes that had never infected humans before, can in fact infect humans. H5 in particular, became lethal to humans.[1,7,25,37,38] This also implies that there are highly susceptible people to the other influenza subtypes, apart from H1, H2 and H3. Though these influenza subtypes had been confirmed to jump from chickens to humans, there was no confirmed transmission from human to human to date, even though in 1993 in the Netherlands, there were two children infected with mild disease, and the father was suspected of passing it to them after being infected by pigs. http://home.microvet.arizona.edu/Courses/MIC438/influenza landmarks.htm

2.1 Influenza virus

Influenza viruses are RNA viruses, and like others viruses of the same category, they are highly variable and undergo rapid genetic changes, acting like a chameleon changing colour, to evade the host immune response.[6,39]

There are three types of influenza viruses, A, B and C. Type A causes pandemics, and both A and B can cause epidemics. The virus types are differentiated by their nucleoproteins and matrix protein. Influenza A is classified into subtypes based on the two surface glycoproteins, haemagglutinin[15] and neuraminidase.[9] (More detail on influenza virus can be found in the PPHSN influenza preparedness guidelines.)

In the PICTs, most immune responses to specific influenza viruses follow natural infection, as vaccines are not readily accessible to most Pacific people of the tropics and subtropics. A 20-year study by practitioners at Epping, NSW, showed that "protection is longer in duration and broader in spectrum following natural infection compared to that afforded by inactivated influenza vaccines."[39]

Antigenic drift
During viral replication for type A and B, some changes take place in their surface glycoproteins. When there are minor changes —antigenic drift— these are responsible for frequent epidemics or outbreaks. So when there are repeated minor changes, they "necessitate annual reformulation of influenza vaccine."[6]. If a new strain differs slightly from the previous one, there may be still some immunity in some members of the population. Note that the higher the differences in the emerging strains from the previous strains, the lower the pre-existing immune recognition and thus the higher the morbidity.

Antigenic shift
Antigenic shift occurs when there are major changes on the surface glycoproteins leading to a new, or novel, type of virus being produced. The emergence of this totally novel virus occurs

fairly irregularly but unpredictably. It must be noted that emergence of a novel virus does not always mean a pandemic is going to happen. A pandemic occurs when a novel virus emerges and the population has no immunity to it, and it is efficiently transmitted from human to human causing disease, usually resulting in high attack rates with accompanying high mortality.[29,31,33,35]

2.2 Interpandemic influenza

Apart from pandemics that occur after about 10–30 years, influenza epidemics continue to be a constant threat to public health on a more frequent basis, sometimes 2–3 years apart. In temperate countries where influenza commonly occurs during the winter season, influenza surveillance data shows a considerable number of people get sick and even die from influenza, either directly as a consequence of the disease itself or as a complication of it (which is usually bacterial pneumonia) or from exacerbation of underlying chronic conditions by the presence of influenza.[27,40–45] (See Part I, Section 3, Epidemiology.)

2.3 Pandemic influenza

An influenza pandemic is a global outbreak of influenza which often occurs when these following events occur:

- a novel virus emerges...
- which population has no immunity to... and
- the virus is efficiently transmitted from human to human, causing disease.

There have been three substantial, and one more benign, pandemics of influenza starting with the 1918 Spanish flu (as detailed in the previous chapter). It has been about 36 years now since the last substantial global Hong Kong flu pandemic, which occurred in 1968.

Potential pandemic strains are commonly derived from aquatic birds, specifically wild and aquatic ducks, because they harbour many novel types of influenza viruses that have not infected humans. While the pandemic viruses that caused the pandemics of 1957 Asian flu (H2N2) and 1968 Hong Kong flu (H3N2) were most likely to be the results of assortments of human virus with an avian virus in an intermediate host, possibly pigs or humans, the origin for the pandemic virus of 1918 Spanish flu was not very clear.[15] Interesting findings from the analysis of three victims of the 1918 Spanish flu from different areas indicated that the A(H1N1) 1918 virus strain closely resembled the subtype of the classic swine virus.[16] It was assumed that there had been already a human-adapted influenza virus "that had been percolated in humans or pigs for many years" until something happened like reassortment, and it turned it to a killer virus and killed millions of people.[44,45]

Influenza A viruses must undergo certain adaptive changes in order to initiate a human pandemic. There are three possible mechanisms for how a new novel type of pandemic strain might evolve, as follows:

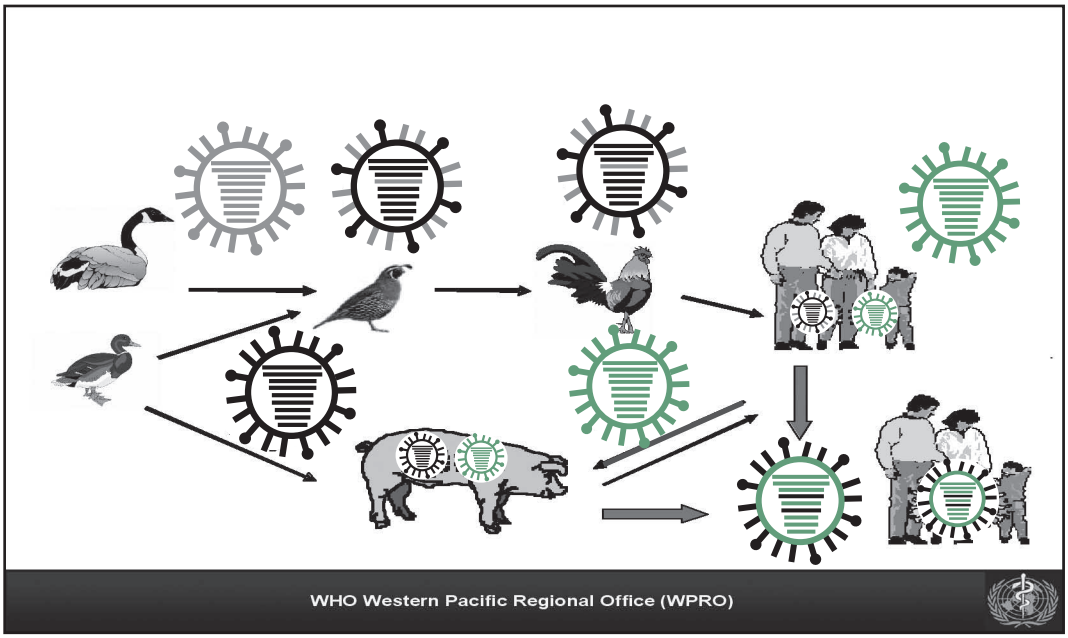
Genetic reassortment between animals and humans

This mechanism, which is illustrated in Figure 1, is an example of *antigenic shift*. This was highlighted clearly by the 1957 and 1968 pandemics, where there was genetic mixing between

an avian virus and a human influenza virus in an intermediate "mixing bowl," which may be domestic pigs or humans. It is with this process that influenza virus could be used as bioterrorism weapon.[46]

Most of the pandemic events originated in and came from Asia,[42–44] and one of the possible explanations was the agricultural and societal practice of rearing chickens, ducks and other poultry with pigs within the compound where families are living. Also, pigs are part of the religious or/and social ceremonies, and are also eaten, therefore they have to be reared in large numbers. Note that these practices are also traditional to most PICTs, thus increasing the risk of pandemic event in the region.

Figure 1: Possible emergence of a pandemic virus by gene reassortment between avian and human influenza viruses



Direct transmission from animal to humans

Influenza A subtypes with pandemic potential can be transmitted directly from animal to human and vice versa. But while these subtypes can cause pandemics, their ability to do so also depends on how well adapted they are to enable efficient transmission from human to human, and cause diseases. This mechanism could have been the case with the 1918 "Spanish" pandemic.

In 1997, avian influenza subtype A(H5N1) was confirmed to have jumped from chickens and infected humans, even being lethal to some. A similar experience was observed in Viet Nam and Thailand in 2004. Nevertheless, while these avian flu subtypes causes disease in humans, they have not mutated to be efficient enough for transmission from human to human. But the possibility of avian flu subtypes to adapt and cause pandemic by being transmitted via this mechanism is not totally erased.

Reappearance of a previously circulating subtype

Three human influenza subtypes have been cyclically reappearing since 1898:[2].

1898 – H2
1900 – H3
1918 – H1N1
1957 – H2N2
1968 – H3N2
1977 – H1N1.

H2 subtype has not caused pandemics since 1957. So, if the cycle continues as above, there may be enough susceptible population to support the possibility of another H2 pandemic.

Since 1997, H5, H7 and H9 have been confirmed to jump directly from birds to infect humans, even causing death, and it is important to pay attention to clinical presentation of human infection from A(H5N1).[1,47] More information can be accessed at http://www.cdc.gov/flu/avian/index.htm

2.4 Mathematical modelling

As it is difficult to predict what the impact of the next pandemic would be like, mathematical models have been developed using variables from previous pandemics to provide estimates as close as possible to what might be happening.

Mathematical models have numerous limitations. They are designed to highlight various estimates on how population density affects the spread of influenza with factors like airports, roads and hospital overload thrown in;[48] some to estimate the economic impact of an influenza pandemic;[49] even estimating the spread of influenza epidemics between geographical areas, and the behaviour of different epidemic wave in specific areas.[50] They are based on developed countries' data, which may not be applicable to developing countries, including PICTs. However, Meltzer et al. claim that the estimates produced from the model they used (Monte Carlo) could be used by developing countries in their "plan to respond to an influenza pandemic."[49]

The software package FluAid (CDC, Atlanta) was recently used to make preliminary estimates of the public health and health sector capacity impacts on PICTs of the first wave, presumably eight weeks, of a coming influenza pandemic.[51] Because of the various limitations of this mathematical model, the results should be interpreted with caution, as it may be an overestimation or underestimation considering that factors like such underlying chronic diseases as Chronic Obstructive Airway Diseases (COAD), diabetes, cardiovascular diseases are highly prevalent in the Pacific. A short overall summary of results for the PICTs using FluAid model is in Table 1 below.

Table 1: Deaths, Hospitalization and medical consultations predicted for the next influenza pandemic at incidence rate of clinical illness of 15% and 35% [51]

Country	Deaths		Hospitalization		Consultation	
All PICTs except PNG	15%	35%	15%	35%	15%	35%
Total	282–1319	586–3076	1001–4926	2334–11,493	180,701–309,872	421,637–723,036

Taking into consideration that one pandemic event may have three waves, and that the above estimates provide the scenario for one eight-week pandemic wave, the maximum deaths of 3076, hospitalizations of 11,493 and consultations of 723,036 provide some crude guidance for the national pandemic preparedness plan for each PICTs. The ultimate need for high political support and commitment towards this preparedness strategy is crucial and cannot be more justified than as of now.

2.5 Vaccines and antivirals

As learned from preparedness for threat of SARS, regardless of limited resources, in times of national emergency, some of the PICTs have become resourceful in striving to acquire whatever they judge as providing the best protection to their people at that point in time: e.g., the Samoa government stockpiling antivirals; Tonga purchasing thermometers @USD150 each x 8, and renovating the isolation ward by providing two negative-pressure rooms.

It is obvious from some PICTs, like New Caledonia, where flu vaccines are administered on a routine basis, that information from effective sentinel surveillance facilitates good planning and enhances political support of vaccination policy. New Caledonia shows a quite typical tropical and subtropical influenza pattern which is not typical of the temperate countries. New Caledonia uses the flu vaccine combination for the Northern Hemisphere, the same that France is recommending to its population. This may be a reasonable decision, knowing that many people from New Caledonia leave for Europe during the winter months of the Northern Hemisphere and come back around February.

Studies conducted in developed countries, signified that "influenza vaccination programmes, in general, are more cost-effective than many other interventions."[49,53] Vaccinating those within 45–64 years of age was also found to be cost-effective. One of the few studies carried out in developing countries on burden of influenza disease concluded[26] that influenza contributed significantly to hospital admission, and even deaths, especially those with underlying chronic conditions like chronic obstructive airway disease (COAD) but not asthma, and heart conditions in 65-year-olds and above (pneumonia was also included in this study). These findings support a wider application of annual influenza vaccinations around their region.[26]

Vaccination policy

The findings from studies and modelling above present an option for PICTs to explore possibilities of proposing a flu vaccination policy as part of the national pandemic preparedness guidelines. CDCC should take a lead role in this exploration, making recommendation to governments, and taking into consideration the cost (annual vaccination) and that the entire population cannot be vaccinated immediately (prioritizing subgroups for vaccination). The proposal must contain priority vaccinees, cost implication over period of time for both routine flu vaccines and for pandemic strains, and legal implications. If the decision is favourable, the particulars related to it should be shared with stakeholders, and communication/media team should take on sharing the information with the rest of the public.

Priority subgroups

Priority subgroups for vaccination or even for antiviral therapy may include HCW, those individuals providing essential services, those 60 years and above, and with underlying chronic disease conditions, children and those who are capable of transmitting influenza to individuals

at high risk for complication. However, if there is ample supply of vaccines, then any individual who wants to protect themself from influenza is encouraged to receive vaccine (e.g. in New Zealand, flu vaccines are free for certain subgroups while for some others, employers are paying for it).

Vaccine development assistance

Collecting viral isolates on a routine basis from sentinel sites worldwide may assist with determination of the best vaccine combination on a yearly basis. Even though infection may be caused elsewhere, considering the unstable nature of the influenza virus and ability to mutate unpredictably, analysing isolates on routine basis may assist with identifying new strains which are of importance for vaccine development, as the A/New Caledonia/20/99(H1N1) virus strain which has been picked up in New Caledonia. Similar procedures can be applied during the prepandemic phase, but more intense during pandemic phases. These will assist with the monitoring of the potential pandemic and pandemic strains, and evolution of a new virus strain. In the Pacific region, isolates can be sent to specific LabNet referral laboratories, which are also the WHO-NICs in the Pacific region, or to the WHO-CC.

During the pandemic phase, vaccines for the new pandemic strains may not be available at least for the first 4–6 months, and most likely they will be initially made accessible to countries in which they are being manufactured. Some countries, like Canada, Ireland and others, have already lined up laboratories and contracts for manufacturers to carry out the vaccine development and production as early as possible once the pandemic strains are identified. Though this may not be applicable to the Pacific, it is mentioned here to encourage having preparedness plans well ahead of time but still within the context of country resources.

Administration of routine flu vaccine may assist to prevent further genetic reassortment of the pandemic strains with the normal flu strain.

Antivirals

Amantadine (Symmetrel®) and rimantadine (Flumadine®) are active against influenza A but not influenza B. The newer, more expensive neuraminidase inhibitors, zanamivir (Relenza®) and oseltamivir (Tamiflu®), are active against both influenza A and B viruses. When treatment is started within two days of the onset of symptoms, they can limit the severity and duration of the disease and reduce viral shedding.

Longini et al. presented some interesting results based on stochastic epidemic simulations using US data to create and compare impacts of influenza pandemic scenarios of an eight-week pandemic wave when pharmaceutical interventions (antivirals) are used, and not used, and with implications on vaccine use.[52] This study showed dramatic decrease in illness attack rate (33% to 2% of population) and death rate (0.58/1000 to 0.04/1000), if targeted antivirals cover 80% of exposed persons, and prophylaxis is maintained for eight weeks; thus the epidemic might be contained. It also highlighted the usefulness of anitvirals to buy time for the pandemic vaccines to be developed and available for use; and also of providing priority groups, including those providing health and other essential services, with access to antivirals so they continue to deliver those services.

The use of antivirals is a consideration for countries or territories that can stockpile them before the pandemic event occurs. It is often the global surge capacity and high prices that hinder countries or territories from considering antivirals as first line of pharmaceutical

response during a pandemic. Donor and PPHSN working partners may consider assistance with stockpiling of antivirals for the PICTs. Priority subgroups are as indicated for vaccines.

Isolates of genes from A(H5N1) from Thailand and Viet Nam had been found to be resistant to amantadine and rimantadine though still sensitive to oseltamivir (MMWR July 2004).[54] Procedures and services to monitor adverse effects and resistance to antivirals, as well as vaccines, must be organized in the event that these pharmaceutical interventions are to be implemented.

3. PREAMBLE

The historical overview described the worst possible scenario for a Pacific lacking in preparedness to respond to an international crisis like an influenza pandemic. Compared to previous years, and in relation to quality of technological resources and scientific-medical knowledge, we are now in a much better position to make some sound predictions on the possible emergence and evolution of pandemic viruses. But when will it actually be going to happen? No one can pinpoint the exact time, but close monitoring of collaborative global, regional and national surveillance may facilitate our making a better assumption.

Most PICTs consider influenza a relatively unimportant disease that does not warrant being a priority disease. But the most recent study of disease burden of influenza in a developing country showed that influenza contributed significantly to hospital admissions and even deaths of those with underlying chronic condition.[26] Better control and prevention of chronic disease conditions like diabetes, chronic obstructive airway diseases (COAD), cardiac diseases and others may contribute to improvement, that is, to a lessened impact of influenza on these illnesses.

Influenza in a pandemic may be presented as in normal flu season with an acute onset of high fever (>38°C) accompanied by constitutional symptoms, but be caused by a new, novel virus efficiently transmitted from one human to another and having the potential to cause diseases with high morbidity and mortality, because the population will have no immunity to the novel virus. The clinical presentation of influenza may change in accordance with the epidemiology of the pandemic.

Influenza is a disease that is "notoriously difficult to quarantine with no guarantee to control."[27] But we learn from a few success stories, from countries spared the ravages of the Spanish flu pandemic, that at times of national disaster, some extreme measures need to be taken where individual human rights are overridden by a legal framework designed to protect the welfare of the society. A example of this would be refusal entry to the country of possible carriers of flu virus from affected countries (as was the case of American Samoa and Samoa during the Spanish flu).

How would the present capacities of our Pacific region fare in responding to the threat or an event of influenza pandemic? An exploration of this issue starts with the topics discussed next.

3.1 Assessment of risk for the Pacific

Though flu season is predictable, especially in temperate countries, the responsible strains are not always predictable. Therefore, the unpredictability of when an influenza pandemic event will occur, and of the ongoing avian flu outbreaks in Asia caused by potential pandemic influenza strains, demands vigilance in surveillance — both of human and animal health, and clear channelling and sharing of updated information worldwide.

Surveillance systems

At present, most national surveillance systems in the Pacific need to be reviewed or developed so as to yield information that will be appropriate and useful for planning.

In the context of influenza or influenza-like illness (ILI), most PICTs have routinely collected clinical data defined and coded as influenza but not laboratory-confirmed. Influenza-like illness (ILI) needs to be clinically defined, so that a standardized clinical definition is accepted and understood. Some territories where both ILI and virologic surveillance are operational, e.g. New Caledonia, are in a better situation with their influenza surveillance systems than island countries.

There are many health programmes like dengue, TB, STI/HIV and so forth under surveillance in the PICTs, and it may be a more efficient use of ressources if these existing surveillance systems for communicable diseases were reviewed and put on a collaborative basis, if possible. The linkage of different surveillance needs within each sector could reduce costs, and result in better coordinated surveillance systems.

National surveillance systems should be linked and coordinated with the surveillance from regional offices like WHO and SPC. Linkage and flow of outbreak alert and outbreak information in the PICTs via PPHSN are ad hoc and proactive and reactive. A more systematic monitoring system for communicable diseases outbreak alerts and events through surveillance in proactive mode, involving stakeholders and working partners of PPHSN, may facilitate timely and appropriate preparedness for threat or event of pandemic.

The new revised IHR, once adopted and utilized, should help improve the monitoring of outbreak-prone communicable diseases through reporting and channelling of timely information to national authorities, and to regional and international levels. Linkage to control and prevention of other infectious diseases which may be of international significance, of which flu is one, will be enhanced.

The ***laboratory capacity*** to confirm influenza disease or an outbreak is very limited and confined mainly to LabNet referral laboratories or level 2 (L2), which are Mataika House in Fiji Islands, and INPC in New Caledonia. These L2 labs are also the WHO National Influenza Centres (NIC). Other territories like French Polynesia and Guam to some extent are better equipped to undertake virologic surveillance for influenza, while the rest of the PICTs have no national capacity for that service on an ongoing basis.

The LabNet technical working body seeks assistance from WHO and working partners like WHO Collaborating Laboratory Influenza Centre (WHO-CC) in Melbourne, to assist with provision of rapid influenza test kits to some national laboratories. Collaboration between the various levels of laboratories (L1 [national], L2 [referral lab] and L3 [WHO-CC]) is crucial not only for virologic confirmation and surveillance but also for screening of viral isolates for new emerging influenza virus strains for global surveillance (FluNet) and development of vaccines.

PICTs, with limited resources, work on shoestring budgets even for provision of routine essential services. The occurrence of an influenza pandemic on top of that could be disastrous, especially if there is no proper planning now. It is only pertinent that each country should formulate a feasible pandemic preparedness plan to guide its government in setting aside provisional amounts in the reserve or state funding, and to identify sources of extra funding for the pandemic preparedness and response plan for the nation.

PPHSN EpiNet regional meetings, 2003 and 2004, proposed a revolving fund as a mean of a stand-by source of funding which will facilitate prompt response to any outbreak of infectious diseases in PICTs, if it is endorsed by the Ministers of Health meeting in Samoa, 2005. PPHSN working partners WHO and SPC may provide the seed money, and PICTs are encouraged to donate shares which can be an investment for future emergency needs, especially for outbreak management. This fund may be resourced during a pandemic event, though the process of allocation and related matters will be very challenging.

There is a ***lack of seasonality patterns*** of influenza in PICTs compared to what is normally observed in temperate countries during their winter/cooler months. Usually, influenza is imported into the Pacific by returning residents or visitors to the Pacific during influenza season, during winter or during an outbreak in their respective countries. Influenza events or epidemics can occur in PICTs any time of the year. For example: an epidemic occurred in Niue in 1983 caused by two returning residents from New Zealand where there was a local influenza epidemic in Porirua during the winter month of May. It killed two Niueans with an infection incidence of 41/100.[27] This reflected the lack of good surveillance system with an early warning systems to pick up these early signs of an outbreak.

Routine influenza vaccines and antivirals are not accessible to most PICTs. Some may argue that most PICTs cannot afford it or/and the lack of seasonality patterns for influenza may complicate the choice of vaccine combination to give. Nevertheless, the impact of accessing vaccines on the natural course and impact of influenza outbreaks should be evaluated, for advocacy purposes, if other PICTs consider adopting a flu vaccination policy.

The lack of good influenza surveillance information within the Pacific to support a proposal for vaccination policy may be one of the fundamental reasons that makes the option of vaccines for PICTs an impossibility. Funding may be the other main reason. The study of disease burden in Hong Kong 2004 had strong implication on a wider application of flu vaccines[1], an undertaking that PICTs can choose to assess influenza disease burden in the Pacific.

Despite lack of flu seasonality patterns in the Pacific, availability of vaccines and the recommended combination of flu vaccines may be guided by information from surveillance of ILI activity in a given country. For example, New Caledonia uses the combination for the Northern Hemisphere which France is using. This may be both an administrative and logical decision, as most visitors to New Caledonia are from France and Europe during their winter months, and vice versa. In New Caledonia, there is usually an influenza peak in February–April when people came back from holidays in France and group activities such as schools resume.

Antivirals are less likely to be available at all. If costs were of little problem and stockpiling was possible, then it may be worth considering. Monitoring both adverse effects of antivirals as well as vaccines are capacity issues that need to be addressed prior to developing policy for pharmaceutical interventions.

Population mobilization has been increasingly fast and easy. The advent of air travel has tremendously increased mobility and contact of people within and from outside of the Pacific region. During the period of the SARS threat to the Pacific, it was obvious that the capacity of our countries to mount a proper border control was far from being adequate. Considering the nature of the flu virus and the ease of transmission from person to person, it is difficult to imagine what an influenza pandemic situation could cause. Measures like wearing masks,

quarantine, isolation and few others that worked with SARS may be futile, expensive or little use with a pandemic event. Timely, appropriate and resource-oriented pandemic preparedness planning may well be the best direction to go.

The ***Pacific population is ageing and has a high prevalence of underlying chronic conditions*** like cardiovascular, chronic obstructive airway diseases, diabetes and hypertension.[27] In the 1918 Spanish flu the attack rate and mortality were highest among the healthy young adults (20–50 years); during the later pandemics of 1957 and 1968, all age groups were affected, but mortality rates were highest among the elderly (65 years and above) and those with underlying chronic conditions.[5,26–28] This is a recognizable risk for the PICTs, especially as vaccines are not accessible to this age group in most PICTs. Perhaps a proposed vaccination policy may be an option for PICTs to minimize impact of influenza on this category of people, as well as providing opportunity for reassortment of human flu virus strains and that of animals/birds.

Promotion of general good health in the general population, which includes good diet, physical exercise, and enough rest, may assist in providing good resistance and protection from viral illnesses for which antibiotics are not useful. It has been observed that in countries with seasonal flu patterns, people take multivitamin supplements, especially Vitamins A and C, to boost their immunity in preparation for the flu season. These routine measures are not to be ignored and should be encouraged during the cooler months in the PICTs.

It is also important for those people with any underlying chronic disease condition, regardless of age, to aim at better control of the condition before the cooler months begin. The clinicians should also be made aware of these issues through provision of fact sheets, brochures, and even through clinical meetings or similar clinical gatherings. They then provide support for these groups of people to achieve that goal.

3.2 Why should influenza pandemic preparedness guidelines be developed?

As indicated from the above summary of situational assessment, there are many issues that need to be addressed to enable the Pacific to be better prepared to fight the threat of or the pandemic event. Though the actual development and implementation of a national preparedness plan is a national task, the PPHSN-CB focal point and working partners (e.g. WHO) as part of their commitment to PICTs need to prepare these guidelines in close consultation with the influenza specialist group (ISG), to provide guidance for easy adaptation and adoption within the context of available resources and infrastructure of each PICT.

The National/Territorial Communicable Disease Control and Prevention Committee or taskforce (CDCC) with the EpiNet team or similar bodies in respective PICTs, are tasked to develop their own national preparedness guidelines, which incorporate a contingency plan according to pandemic phases by WHO or as the country decides.

3.3 What do these guidelines hope to achieve?

The guidelines are intended to be a living or evolving document with a framework that will enable continuous review and update from time to time to ascertain its relevance and feasibility with upcoming situations. They should be used as a reference by PICTs, and should assist them in developing their own national pandemic preparedness guidelines and contingency plan. They provide clear suggestions on the roles and responsibilities of the members of the national communicable disease control and prevention committee (CDCC) both before and during a pandemic.[29–34]

They are aimed at assisting planners of pandemic preparedness guidelines, facilitating minimization of potential effects on morbidity and mortality, and minimization of politico-social disruption when a pandemic event occurs. The guidelines are designed to be simple yet clear on the process of preparedness to address the threat of or pandemic event by walking the reader(s) through the issues that should be addressed, the process of planning, implementation, monitoring and evaluation — that is, from getting started, to when to declare a pandemic over, and to the aftermath cleaning up.

These guidelines can be used for lobbying and advocacy for high political support, and for support of donors and other working partners, like WHO, SPC and others.

3.4 Who will use the guidelines?

The guidelines are intended for use by a wide range of people who will play roles in the pandemic preparedness planning, reviewing and monitoring the response, and even individuals who wish to take relevant individual part in the fight. This will include individuals of national and territorial EpiNet teams and CDCC, government ministries e.g. MOH, Ministry of Agriculture, Forestry and Fisheries (MAFF), Quarantine and Customs, Justice and Law, Immigration, Ministry of Works (MOW), National Disaster Department, and others: veterinarians, planners, politicians, members of civil societies, administrators, volunteer services, health-related NGOs: e.g. Red Cross, Family Health; telecommunication/media and communication personnel/organization or any individual in the community who can play a part in the response.

The national or territorial EpiNet teams and Communicable Disease Control and Prevention Committee (CDCC) or similar bodies should oversee the implementation of the guidelines.

4. GETTING STARTED

The event of SARS in the world in 2003, and the threat it posed to PICTs, was like the dress rehearsal for the threat and dilemma of an influenza pandemic. Differing levels of SARS threats penetrated the PICTs, and so did differing levels of responses. For example, Kiribati, being threatened by returning seafarers working in Asia, brought these men straight from the airport to hospital isolation, not realizing that there had not been any legislation to back up its action. Whereas in Tonga, as soon as WHO issued information of SARS, a submission was made from MOH requesting SARS to be recognized as one of the notifiable diseases as contained in the Public Health Act category on communicable diseases. It is widely accepted that the potential impact of influenza pandemic will be much worse, however, and response may need to be sustained for a longer period of time.

One of the most common responses from PICTs to SARS threat was the formation of SARS taskforces, and most of them were multi-sectoral in membership. Some countries and territories have changed SARS taskforce to national epidemic taskforce or other names. But for the purpose of these guidelines, all national taskforces will be referred to similarly as national or territorial Communicable Disease Control and Prevention Committees (CDCC).

The importance for PICTs of commencing the process of their respective national pandemic preparedness guidelines or plan now cannot be overemphasized. These PPHSN guidelines together with the WHO national checklist (Annex 2) can be used as a guide for the CDCC and their working partners to get the process started.

The following events or activities may occur simultaneously, and not necessary in the sequence they are presented below. It is important that core members of CDCC are officials with access to resources who will be able to assist with getting things done. In a country or territory with limited resources, this will be crucial.

4.1 National or Territorial Communicable Disease Control and Prevention Committee (CDCC)

The national or territorial CDCC includes EpiNet teams with a wider multisectoral strategic membership with few of these countries or territories that have only members from the Ministry of Health. Below are suggested members for consideration for the core members of the CDCC.

It is suggested that the Chairman for the CDCC be the Minister of Health or as he/she nominates or directs. This may be the first step towards lobbying for gaining political support for the endorsement of the pandemic preparedness guidelines. The suggested members include:

Ministry of Health
Minister of Health (Chairperson), EpiNet team members, public health communicable disease specialist, epidemiologist, surveillance specialist or similar, laboratory/virologist/LabNet member, medical superintendent or similar, chief clinician or similar, chief nursing officer or similar rank, pharmacists, infection control specialist or similar, health planner, information specialist/statistician.

Others
Government departments:
Head of the state's office or similar
Immigration (border control, quarantine officers)
Legal advisers
Finance department
Defence services
Police department
Education department (also for mission schools)

NGO/quasi-government:
National disaster committee member
Media and telecommunication
NGO (e.g. Red Cross, Family Health, religious health services, animal association (poultry, pigs etc))
Fire brigade
Private sectors
Statutory boards
Member of civil societies or similar

In-country UN office:
WHO/country liaison officer (CLO) (if WHO has an office in the country)
FAO (office in country)

Coopted members or as decided by country:
Local MP
International/regional organization and donor agencies represented in countries eg, UNICEF, EU, AusAID, NZAID, Canada Fund, JICA and others in country.
Embassies: e.g. United Kingdom, China, and others
Relevant NGOs or committees according to the situation.

The number of people included in the core CDCC may be kept small, depending on the decision by the country. There may be members with a relatively high profile politically and in the required field of expertise from different essential services including government and nongovernment representatives, private sectors with inbuilt resources to help facilitate implementation of the CDCC activities.

Subcommittees may be formed under the auspices of the CDCC, as well as working groups that report to various subcommittees. All activities are reported to CDCC in their indicated routine meetings. For example: a subcommittee for health services calls a group of health-care professionals to work on guidelines for clinical management of influenza and complications; infection control manual; staff management; and others. Another subcommittee on surveillance may be formed, which includes members from human and animal health services; epidemiologists, public health specialists/professionals, laboratory/virologist and so forth.

The core members and functions of the CDCC should be laid out clearly and submitted for endorsement by the Cabinet. Its core functions include:

1. The CDCC, including the national EpiNet teams, should be acknowledged as the advisory body to the government during the prepandemic and pandemic phases.

2. Roles and responsibilities of the government should be clearly laid down, and the communication officer or spokesperson and their team should include this in their community messages as well as the brochures distributed to the nation. In the message, the reasoning behind what the government can do, and what may be done, should be clear. For example: the government should explain why or why not, that vaccines can or cannot be available, or if not available now, when can that be available. The same goes for the antivirals, as mentioned earlier.

3. It should foster and maintain the harmonious collaboration and coordination between all stakeholders and players in the prepandemic preparedness phase and during the pandemic event.

Other functions of the CDCC may include the following:

4. To delegate clear roles and responsibilities to its members to carry out within a certain length of time, and to present progress reports to its specified regular meetings. These tasks may include the national tasks as outlined later in this section.

5. To identify official communication adviser(s) who should possess communication skills with technical knowledge of the situation. This adviser(s) identifies official spokesperson(s) for various jurisdictions or provinces as it applies to a country or territory, and these will be submitted for information and endorsement by the CDCC (see also Chapter 8).

6. To liaise with other bodies/organization/institution on important issues regarding the pandemic preparedness plan. For example: conduct an in-country assessment of available resources, capacities in different services, inventory of logistics, economic assessment, and others. These different areas must be represented in the national situational analysis teams. Another alternative is for each department or related departments, NGOs or group of them to carry out their assessment with all results brought together to a core group that will develop the national pandemic preparedness plan or guidelines.

7. To oversee progress reports on preparedness activities, including the gaps identified in the national situational assessment report. For example: improvement of surveillance systems has been identified as a priority need. Process/activities to improve it must be documented and a progress report must be presented to the CDCC via the human health and the animal health representatives in the meeting.

8. To oversee updates and collaboration with WHO as in FluNet, global surveillance and possibly with FAO. This task can be delegated for the WHO/CLO and/or EpiNet teams to be responsible for the regular updates. The updates should be relayed to the CDCC as well as to communication adviser should she/he not be in attendance at the meeting.

9. To ascertain clear channels of communication between members of CDCC and with other stakeholders, including members of the public: for example, a dedicated person on a rotating roster to be available at all times through mobile phone to answer questions regarding the preparedness status of the country to address the pandemic threats or occurrence. Also, in time of pandemic event, setting up the equivalence of a hot-line service should be considered, not just for the public and other stakeholders but also for the staff members providing health services to the sick individuals.

10. To oversee the availability of counselling services for psychosocial support during the pandemic occurrence. This is especially in view of the stress, emotional uncertainty (e.g. commitment to work versus personal safety/safety of loved ones), and dilemmas that may affect health-care workers. It is anticipated that during a pandemic event, medical/health services will be overwhelmed, and stability and confidence of staffs in the system must be maintained. Similar services may be considered to be freely accessible in the respective communities. Various existing groups like religious leaders and groups, or women groups or peer groups can be explored to assist in provision of counselling services.

4.2 Political commitment

A high level of political support is paramount for the success of the development and implementation of the national pandemic preparedness guidelines. Advocacy for the political support and commitment may be initiated by the selection of a chairperson and other members of the CDCC. Through CDCC and its working partners, local and international, strong advocacy should be undertaken using updated information on recent outbreaks as of avian flu and the threat of potential pandemic strains, and revisiting the lessons learned from the SARS threat to PICTs.

It must be also stressed, based on records of past pandemics especially of 1918, that a pandemic event may be disastrous in its impact on national socio-economic and political structures. The need for a collaborative effort from all stakeholders is crucial, with the government taking a lead role in protecting and ensuring of the welfare of its people, and CDCC being equipped with its local expertise and the knowhow in readiness to take direction from and to advise government on the national pandemic preparedness guidelines.

Increased regional and international collaboration and networking may not only increase the support for those professionals and teams involved in the national and regional pandemic preparedness planning, but may work as instruments for international peer pressure, and may lead to more recognized political commitment.

As the region as well as the world is now focusing on the likelihood of an influenza pandemic occurring, the CDCC and EpiNet teams should push forward on the initiative to get started with the national influenza pandemic preparedness guidelines. The government's approval of this document will imply commitment on their part to support the proposed activities in it, as well as to explore support from its working partners and donor agencies to help support the nation's preparedness efforts.

WHO may assist by further reminding respective governments of their support, and commitments in the last World Health Assembly to address influenza pandemic preparedness planning and activities at their respective national levels. National pandemic preparedness guidelines should be proposed for endorsement at the Regional Ministers of Health meeting in Samoa, March 2005. PPHSN-CB focal point, SPC, is to itemize it in the agenda of that meeting.

4.3 In-country assessment

This is a national task, so relevant representatives from different sectors should be considered to be part of the national situational analysis or in-country assessment team. Generally, this team assesses

the current capacity of its country, identify and prioritize gaps and activities following the WHO national checklist (Annex 2). This checklist is only to assist; the final say rests with the country.

For example:
Identified gap: Animal health surveillance not in place and need to collaborate with human health influenza surveillance systems.

Suggested approach:
Surveillance subcommittee: includes representatives from human and animal health services; surveillance specialist/epidemiologists, vets, public health specialists/professionals, EpiNet team members, representatives from poultry/pig farming associations or similar bodies, legal adviser and communications officer or any other that the group feel should be included. This group meets, plans, explores situations, and acts accordingly. Progress reports will be presented to CDCC meetings.

The in-country assessment calls for dedication and commitment from all parties, as this is going to be a huge exercise. Coordination of these activities may be best overseen by the CDCC in close collaboration with the national EpiNet teams and other members as designated by the CDCC.

The procedures include the following.
- The assessment team is selected and the team selects its chairperson and other position holders. Also, the team may coopt relevant personnel as the assessment task is in process.
- A set timeline should be agreed upon between CDCC and the in-country assessment team.
- Technical assistance may be requested from working and donor partners like WHO, SPC, AusAID etc.
- When task is complete, reports are presented to CDCC.
- National pandemic preparedness guidelines or contingency plan is prepared by basically the group that carried out the in-country assessment or any decided by the CDCC.

A pandemic response centre or equivalent may be set up to collect and collate progress on specific activities carried out by CDCC and working committees and groups. This centre may act as the CDCC secretariat for pandemic preparedness strategy. Preferably this centre is located at the main office of the health department, but all working partners of CDCC can identify funding sources for the operating costs of this centre. This office can be operational once funding is available and preferably from the prepandemic phase.

How, when and what each country does on its national situational analysis or in-country assessment depends solely on its own decision which is reflected in the decision of the CDCC.

4.4 Legal and ethical issues

In a national disaster like a pandemic, there are public health measures that need the support of the national legal system in their implementation. It is therefore important to know what legislation or policy exists that covers situations similar to a pandemic.

In some PICTs, influenza is a notifiable disease. In others, the authority to declare that influenza is a quarantinable disease rests with the office of the President, Prime Minister or Minister of Health. This type of information needs to be identified and verified.

A Quarantine Act usually authorizes a person in relevant authority — e.g. Minister of Health or as designated — to take necessary measures to eradicate or control the spread of infectious disease. This may include:

- prohibition or restrictions of migration between islands or towns/states;
- prohibition of public gatherings or closure of schools
- control of facilities and materials for quarantine purposes: e.g. vaccination, treatment, drug stockpiling and dispensing etc.
- action under the Act to override quarantine measures prescribed under the nation's law.

It is necessary to have legislation, such as a Public Health Act, in place well before a pandemic event arrives. Even though it is most appropriate to carry out the pandemic preparedness according WHO's described pandemic phases, we must realize that the guidelines or plan may be affected by the epidemiology of the pandemic event locally, regionally and internationally, and that may have an impact on the respective responses in respective countries and territories. Example: In Phase 0 Level 3, human-to-human transmission of the pandemic strain has been confirmed, the PICT had not included vaccination as a possibility in its initial preparedness plan. The situation has changed and now there are vaccines available but not enough for everyone. Its CDCC or similar body in consultation with the government have to decide on the priority subgroup for vaccination; set up monitoring system for side effects; oversee communication and media strategy and other relevant preparation. Thus, legal and ethical issues need to be addressed and put in place well before a pandemic event occurs.

4.5 Funding

Resource-limited countries, including the PICTs, need to formulate a feasible national influenza pandemic preparedness plan based on the findings from the situational assessment. Advocacy for a high level of political support is paramount so that allocation of funding for emergency situations like a pandemic can be agreed upon. In some countries where there is allocation for national disaster/emergency, it may worth exploring the option of identifying and specifically allocating a certain amount for influenza pandemic event. This is very challenging for the PICTs as the available and most needed resources are limited.

Possibilities for funding a pandemic response centre with a couple of fulltime staff and related logistic support should be addressed. It is very likely that this type of setup will enhance the smooth running of the preparedness planning as well as the response to the pandemic event.

The PPHSN and working partners' proposal of a revolving fund for PICTs to address epidemics can be supported by each PICT and donors by submitting a contribution to the seed amount that may be put forward by the main working partners like SPC and WHO. This is an issue that calls for the nations' highest political support so that some allocation can be put towards the revolving fund as a regional reserve for the pandemic event.

4.6 Outline of national activities

A matrix outlining national activities as agreed upon by all parties should be laid out clearly in terms of: what is the task, who is responsible, time frame and expected output during the prepandemic and pandemic phases. The activity matrix should be at the Influenza Command Centre and widely distributed to all stakeholders, and also to the public (by the communication team).

In Chapter 8, the contingency plan according to pandemic phases should outline national activities according to the phases. Specific national activities can be incorporated by respective countries or provinces as they see fit.

4.7 Roles of WHO and PPHSN-CB focal point

WHO

From the perspective of these influenza pandemic preparedness guidelines, WHO is mandated to play a crucial role in global surveillance and response to global threats and events of communicable diseases through its headquarters in Geneva, through its regional offices and down to countries through its national offices (CLO). In relation to influenza pandemic preparedness, WHO roles are mainly in:

- maintaining up-to-date summary and reports on the WHO FluNet website
- reporting in the Weekly Epidemiological Record
- informing national health authorities, national influenza centres (NIC) and other participants in the influenza programme about the global influenza situation
- developing proposals to help guide national policy makers or those implementing national policies, and
- issuing press releases.

WHO, as a working partner of PPHSN and permanent members of the PPHSN Coordinating Body, works in close collaboration with the PPHSN-CB focal point to address influenza-related issues in PICTs by providing technical support and monetary assistance as agreed upon with working partners.

PPHSN-CB focal point

The role of PPHSN-CB focal point is undertaken through the PPHSN Coordinating Body to support PPHSN operational arms: EpiNet, PacNet and LabNet, and through these, the PPHSN-CB focal point works closely with PICTs in their preparedness process to face the looming threat of an influenza pandemic in collaboration with its working partners like WHO and others.

The development of the Influenza Specialist Group (ISG) by the EpiNet regional meeting in 2003 further emphasized the role of the PPHSN-CB focal point in supporting PICTs in their pandemic preparedness process. The preparation of the PPHSN influenza pandemic preparedness guidelines is through close consultation with the ISG and working partners like WHO.

There are regular updates on the PacNet to its members on the influenza events, be they animal or human, around the region and the world. During these past months with the avian influenza outbreaks in Asia and further, PacNet has been updating PICTs through its server at least weekly or more frequently if needed. Other epidemic prone communicable diseases like dengue, leptospirosis and measles are also being updated similarly through PacNet.

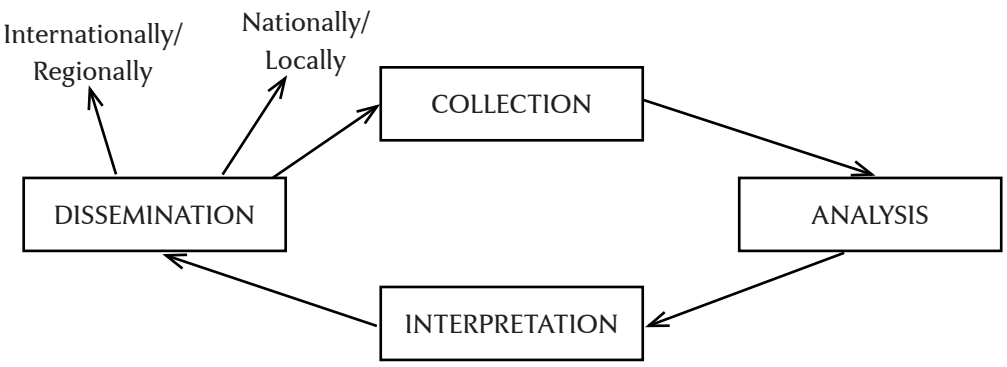
Other information on influenza and other communicable diseases and related activities is also being published through the quarterly *Inform'ACTION*, produced by the PPHSN-CB focal point with contributions from all over the region.

5. SURVEILLANCE

Surveillance has been defined as "an ongoing systematic collection, analysis, and interpretation of outcome-specific data for the use in the planning, implementation, and evaluation of public health practices", and not merely collection of data.[55] Thus, a timely, representative and efficient surveillance system is the cornerstone of control of epidemic prone communicable diseases.

As influenza is not a priority disease to most PICTs, the surveillance of it may be similarly viewed. However, understanding and applying the knowledge of surveillance is useful for other diseases too. Surveillance should lead to action, and not just collecting data. It is a tool to keep us (PICTs), and the world, on top of threats of epidemics and even of pandemics. The various aspects of the surveillance cycle are illustrated in Figure 2.

Figure 2: The surveillance cycle



Each PICT can judge for itself where or in which station in the above surveillance cycle its surveillance system is parking. The next step aims at refining data collection and moving your country's surveillance vehicle to complete the cycle, and to ensure maintenance of the momentum. It is hoped that improving influenza surveillance will help to promote effective surveillance of other communicable diseases in PICTs, by collaborating surveillance of communicable disease programmes.

There are different and interrelated levels of influenza surveillance: global, regional and national levels. WHO takes a pivotal role with the global surveillance and collaborates closely with the Food and Agriculture Organization (FAO) and World Organisation for Animal Health (OIE) on animal health issues which threaten human health. WHO FluNet collaborates and connects influenza surveillance information from different credible sources around the world, including WHO collaborating laboratory influenza centres, national influenza centres, health research institutions, and other credible sources and relate information worldwide including the regional and local stakeholders.[1] This collaboration and its information updates are one of the fastest and most reliable weapons to get the world informed, and prepared well in time before pandemic strikes.

PPHSN through PacNet and LabNet, and cross-postings from PacVet maintains continuous provision of updated information from and to its member countries and territories on influenza

as well as other communicable disease outbreak alerts, and on those communicable diseases that are of international significance.

Interpandemic and early warning systems surveillance are also described in the PPHSN influenza preparedness guidelines. However, they are repeated in this section as a reminder and also to highlight the paramount importance of surveillance as a tool for a timely and effective warning and alert for a pandemic preparedness response.

5.1 Objective and rationale for the national surveillance system

PICTs are in varying levels of their communicable disease surveillance systems, and they are faced with the challenge of how their limited resources would be divided yet yield maximum output. They should set clear objectives and the scope of their surveillance activities, and resort to using existing services and infrastructures. For example: to detect and respond to early warnings of potential influenza outbreaks in the country, collaboration with animal health services and setting clear channels of communication with identified personnel should be discussed and recorded. Also, ascertaining constant updates from the region and international-related events, key responsible personnel from human and animal health services should have access to PacNet and PacVet.

Each PICT should review and define the objectives of its respective surveillance mechanism. That should be part of the national situational analysis/assessment issue. However, from the perspective of this document, the national surveillance system should be able to:

- rapidly detect increased influenza activity in the area/village/zone either through ILI in humans or unexplained deaths in groups of animals or birds/poultry
- initiate investigation of these clusters, and report accordingly
- promote quick confirmatory processing of virology analysis of responsible virus from ILI patients. LabNet support as well as its working partners in providing initial test kits for influenza antibodies detection should be sought by national laboratory (L1)
- facilitate rapid dissemination of information from surveillance results, and disseminate widely to local authorities and CDCC, and to PacNet/LabNet, and FluNet
- facilitate appropriate responses to different phases of pandemic.

A surveillance checklist may be considered to encourage the sustainability of a good surveillance system (Annex 2).

5.2 Interpandemic phase

Surveillance in interpandemic phase is otherwise referred to as what every PICT should be routinely operating within the Ministry of Health system, as part of the overall communicable diseases surveillance system. It must be realized that when influenza surveillance is set up and effectively operating at this stage, it will be the same system that will be reviewed and adapted as the epidemiology of influenza may change as the pandemic situations arise.

Routine epidemiological (syndromic) surveillance should be set up with a clear-cut definition of influenza-like illness (ILI) or as similarly described by country or territory. This is further detailed in the PPHSN influenza preparedness guidelines. However, for the smooth flow of the content of this document, it may be relevant to repeat it.

The clinical case definition for influenza-like illness (ILI) is as adapted from WHO definition, that is: ILI is an acute onset of fever (>38°C) with the following symptoms: cough, sore throat and/or myalgia, in the absence of any other diagnoses (see Part I, 4.2 Surveillance case definitions).

The younger the patient, the more important they are in terms of severity of the disease and the duration of viral shedding. Each country may wish to standardize their definition of ILI with these guidelines as well as with WHO's. The challenge in clinically diagnosing influenza is that other viral diseases, like dengue fever and other respiratory viral diseases, may be confused with it as they present with similar symptoms.

The ***confirmed influenza case*** is a case with laboratory confirmation by detection or isolation of influenza virus in nasopharyngeal secretions or demonstration of a four-fold or more increase in haemagglutination antibody titres to influenza between acute and convalescent sera.

Most PICTs do not have the laboratory capacity to confirm the presence of influenza virus from nasopharyngeal secretions, and very few laboratories can perform rapid testing for influenza viral titres. Thus, specimens for confirmation of influenza virus are to be sent to referral laboratories, that is, NIC or the WHO-CC. The cost of these services may be a constraint to the efficiency of delivering and fulfilling influenza surveillance requirements. The lack of seasonality in the PICTs makes influenza surveillance an all-year-round activity.

Sentinel surveillance: Sentinel physicians/clinicians with sentinel sites may be set up by census divisions throughout the country, but in smaller countries and territories of the Pacific sentinel sites can be set up more by convenience. The interested physicians/clinicians should be well briefed on the procedure of taking samples, when to take them, that is, random days of the week, and where to send to. There may be clinicians in countries who have been involved in doing surveillance on other diseases like dengue, who are already familiar with how sentinel surveillance is carried out and would like to be involved in influenza sentinel surveillance.

Some of the territories are currently carrying out this type of surveillance: for example, New Caledonia. Sentinel sites were picked only in Noumea, the capital, because of location and convenience for the transportation of specimens, and the same clinicians are involved in carrying out sentinel surveillance on other diseases. The result of this sentinel surveillance on influenza not only reflects the lack of pattern of flu throughout the year, but also shows the usefulness of reporting with the assistance of laboratory testing and making a diagnosis of influenza to making a decision on vaccination policy for a country (see figure 1, part I). Influenza events in the Pacific are often sparked off by visitors who bring in their own specimens of influenza virus to PICTs from affected countries.

For the PICTs to improve or develop their sentinel surveillance systems, this information and these suggestions may assist in sentinel surveillance system set-up.

- Sentinel sites should be geographically representative for the samples they should collect. Sentinel sites may include hospitals, GPs, and health centres/clinics.
- INPC in New Caledonia and Mataika House in Fiji Islands are official WHO National Influenza Centres.
- As samples from sentinel sites may be difficult to obtain in an all-year-round surveillance, and as they may not be transported easily to laboratories in PICTs, the sites, and frequency of sampling and pattern of sampling may be determined by the local circumstances, especially outbreaks.

- Nursing homes or similar institutions may be used in addition to the usual health-care settings. Other settings, such as schools or prisons, may also be used.
- Other indicators may assist in routine monitoring of possible influenza-related cases, like those admitted to a paediatric ward with respiratory infection; or others/adults presenting to outpatient or Accident and Emergency (A&E) departments with a diagnosis of pneumonia, and samples maybe taken from some of these cases for further analysis.
- A specific memorandum of agreement (MOA) may be signed between a PICT and the NIC for performing tests for influenza from sentinel sites on regular basis, as this may have cost implications.

5.3 Prepandemic phase

During this global phase (Phase 0 – WHO) , there are three suggested events for consideration[7] in relation to surveillance activities:

Phase 0.1: when the influenza strain with pandemic potential is identified in birds/animals
Phase 0.2: when the influenza strain with pandemic potential is identified in humans
Phase 0.3: when human-to-human transmission of the strain with pandemic potential has been confirmed

Note: Although in our national pandemic preparedness plan, we need to address possible interaction between animal outbreaks and the mutation into a pandemic strain, it may not be that animal/poultry influence the outbreak. Also, some levels of the pandemic phases may be skipped when a pandemic event occurs.

During this above phase, surveillance in all countries, despite the limitation of the PICTs, should target the description of circulating strains, and early detection and reporting of the potential pandemic strains in animals and in humans in all countries.

As indicated above, activities need laboratory confirmation, which may be mainly applicable only to some countries and territories in the Pacific. However, as contained in the activities for early warning systems, specimens from suspicious cases need to be taken and send to LabNet referral laboratories, that is, the NIC or the WHO-CC in Melbourne.

5.3.1 Early warning systems

This is a very important part of the surveillance systems which should be implemented with ease in its initial stage in the PICTs, even though specimens need to be taken to confirm the clinical diagnosis by laboratory tests. It is very important for EpiNet teams and working partners either in the human or animal health services that public health measures not wait until the laboratory test results are available. Appropriate responses need to be initiated accordingly while awaiting laboratory results: for example: a cluster of students from a school show ILI and few of them have been swabbed/ aspirated for nasopharyngeal secretions. While the samples are being analysed, a decision must be made whether to close the school or not.

Early warning systems need to target and investigate clusters, either human or animal, based on information, even if it is just rumours. Rumours of people in the community or students, prisoners or elderly from an institution who are suffering from an ILI, or of animal/birds that have died without obvious causes, should be thoroughly investigated. Results from these cluster investigations should be shared with all stakeholders, including the people of the clusters or the owners of the birds/animals.

If your area/country is affected, enhanced surveillance for ILI cases may need to be modified, depending on history of exposure, findings from case or cluster investigation, or reports from medical surveillance of high-risk groups like poultry workers, cullers, HCW exposed to any of those diagnosed with influenza with the avian strain: e.g. H5N1.

5.3.2 Enhanced surveillance

Epidemiologic (morbidity and mortality) and virologic (typing and isolation) surveillance are to be enhanced during this phase as well as during the pandemic.

Epidemiological data assists with monitoring of the situation. The ILI definition may be modified according to the findings from these surveillance data. It is also important to take specimens of nasopharyngeal secretions or sera for viral studies. These studies will not only monitor the type of strains during the phase but also assist with vaccine development. (More information on virology is given in the next chapter.)

5.3.3 Interaction between human and animal surveillance

The national pandemic preparedness plan should address the possibility of possible interaction between animal outbreaks and a pandemic even though the human pandemic strain may not necessarily evolve from animal outbreaks.

A basic system for animal surveillance should be in place in countries or territories. It should be noted that agricultural domestic animals practices in China, the hypothetical epicentre for pandemic strains, are similar to practices in the Pacific, like keeping pigs and chickens as a mixed type of farming around the family compound. Pacific Islanders love eating pork. For example: Tongans keep many pigs of all sizes and forms for traditional cultural ceremonies, and for their own consumptions.

Collaboration between these two type of surveillance, human and animal health should be developed and be operative through:

- sharing and standardizing clinical case definition
- exchange of laboratory materials eg reagents, methods of testing
- exchange of epidemiological and laboratory information
- development of advice on food safety and public health.

5.3.4 International Health Regulations (IHR)

IHR aims to prevent, and protect humans against, the international spread of communicable diseases. It is important for PICTs to have a good understanding of the IHR so that national and international reporting on communicable disease surveillance can be carried out according to IHR algorithms. It is a framework to assist with the global surveillance, and a global alert system when an outbreak of a communicable disease in an area/country occurs which may be of international significance, and needs to be reported to the WHO global surveillance network. Details of the new IHR are accessible through the WHO website: http://www.who.int/csr/ihr/en/

5.4 Pandemic phase

The pandemic usually comes in waves, and these may occur at different times in different areas. Surveillance needs to be tailored accordingly to collect relevant information for proper response planning. Given the limited access to necessary required services for early detection

of pandemic strains, PICTs should exhaust all available means to obtain relevant information regarding the emerging influenza pandemic.

When there is a pandemic strain identified in an area/country and the conditions for a pandemic to occur are fulfilled, the following surveillance measures are considered:

When pandemic strains are in neighbouring countries (outside the region or your country)
When there is proven human-to-human transmission of influenza pandemic strains overseas, surveillance should be intensified and targeted at avoiding or detecting its introduction into the country:

Border control: For returning residents or visitors from declared affected areas, scaled up border control will be instituted, like issuing arrival cards containing screening questions and health advice on signs and symptoms of flu, simple tips for home management; where (phone number, nearest health-care facility, hot-line services), who (HCW – at health-care facility in area, doctor, nurse or CDCC health members) to report and/or get further medical services.

As this type of surveillance may involve strict border control and related activities, the CDCC will take responsibility in liaising with relevant authorities: e.g. immigration, quarantine, aviation departments and other working partners to assist in executing these tasks. Some of the procedures that were enforced on border controls during the SARS threats to the PICTs may be activated, like warning visa applicants through the immigration communications, and there may be a need to restrict granting of visa if it is indicated within the legal framework of the nation.

The challenges arise from the general clinical case definition of ILI, the short incubation period of 2–3 days (1–7 days), and the limited capacity of the nation, making successful implementation of the above activity fairly difficult.

Hospital morbidity and mortality records: For example, records of patients presenting with severe pneumonia should be monitored (as most bacterial pneumonia causative organisms are able to be identified in most laboratories of PICTs).

Contacts of index patients: Contacts of any suspected or confirmed cases should be monitored by providing them with the health advice form containing the instructions on where, who and how to access help when flu-related situations arise.

Virological surveillance is stepped up by taking extra convenient samples for analysis, which assists in monitoring possible emergence of a new virus to the country/territory. As capacity of laboratory services in relation to influenza identification at national level is almost nonexistent except for some territories, assistance from L3 laboratories like WHO-CC in Melbourne and other laboratory working partners of LabNet can be easily called in. Discussions and agreement for receiving specimens from NIC or WHO-CC should be ascertained before collecting samples to be sent.

Even though apparent animal outbreaks may not necessarily provide the precursor for a pandemic strain, there should be a basic surveillance system set up for animals. It is strongly recommended that areas and equipment for testing animals and animal-related specimens should be separate from that for humans' influenza specimens. However, collaboration between human and animal health surveillance should be greatly encouraged and supported by CDCC and working partners including the PPHSN, like WHO and SPC.

Updates on travel advice and direction from WHO should be obtained on a regular daily basis through WHO/CLO or local EpiNet teams, and related to CDCC as soon as they come to hand. Activities should follow closely the recommendations from WHO and also be based on available resources at the national level. Tourism industries, both nationally and abroad, should facilitate compliance with the direction issued from WHO and discourage tourist movements across borders.

When pandemic strains are in the country

A pandemic strain is a new or novel type of influenza virus which emerges as a result of antigenic shift, and which the population has no immunity against. It should be reminded again, that not all novel types of influenza virus strain will cause a pandemic, only the ones efficiently transmitted from human to human and virulently causing illness, and even death.

Once pandemic strains are identified or strongly suspected in your own country, an immediate disaster alert is issued from the CDCC to the government, while the communication/media team works on the how, when and what to impart this warning alert to other stakeholders and the public. It may be best for a high political figure, the Prime Minister and/or Minister of Health, with the communication adviser to convey the first announcement to the public through the national media, or as the country decides best.

The surveillance for when the pandemic strains are outside of your country continues plus there may be need to take many more samples (10–20) from ILI patients for further analysis to facilitate identification of new strains, and for vaccine development purposes by the WHO-CC. For PICTs, this procedure can be carried out in some countries with NIC like New Caledonia and Fiji Islands, to monitor the presence of new pandemic strains in the region by close collaboration with the NIC and WHO-CC. The decision of a country to send specimens for analysis can be discussed by individual countries with the NIC and WHO- CC.

Though some of the PICTs are giving routine flu vaccine in their countries, the possibility of vaccines for pandemic strains becoming more widely available is anticipated, considering the possible change of scenario when the pandemic event occurs. This relates to the possibilities for countries, during their in-country assessment, deciding to approve a vaccination policy for their respective countries. The same option applies to the purchase or stockpile of antivirals.

The contingency plan for health services, other emergency services and essential services according to pandemic phases is enacted (Chapter 8).

6. LABORATORY SUPPORT

Laboratory services and systems are an integral part of surveillance, both from the community and organizational perspectives, to make detection and characterization of the influenza viruses available promptly. This is essential for monitoring of the pandemic strains and for vaccine development.

Within the Pacific region, there are two official WHO national influenza centres (NIC), IPNC in New Caledonia, and Mataika House, Fiji Islands. They are also the referral laboratories (LabNet) for PPHSN member countries, the PICTs. Laboratory services in French Polynesia, and to some extent Guam, are also providing higher level of services than the rest of the PICTs. Some of these referral laboratories, especially Mataika House and WHO-CC in Melbourne, can provide higher services in relation to influenza virus analysis, but remember that a focus person in that laboratory has to be notified before you send specimens there.

In the pandemic preparedness guidelines, the specimens to be taken and the form to be filled are as in the PPHSN influenza preparedness guidelines. It is anticipated that in a pandemic it is unlikely that there will be many specimens taken for screening, but there will be sporadic specimens for monitoring the event and for identifying new emerging influenza pandemic strains within the area or community.

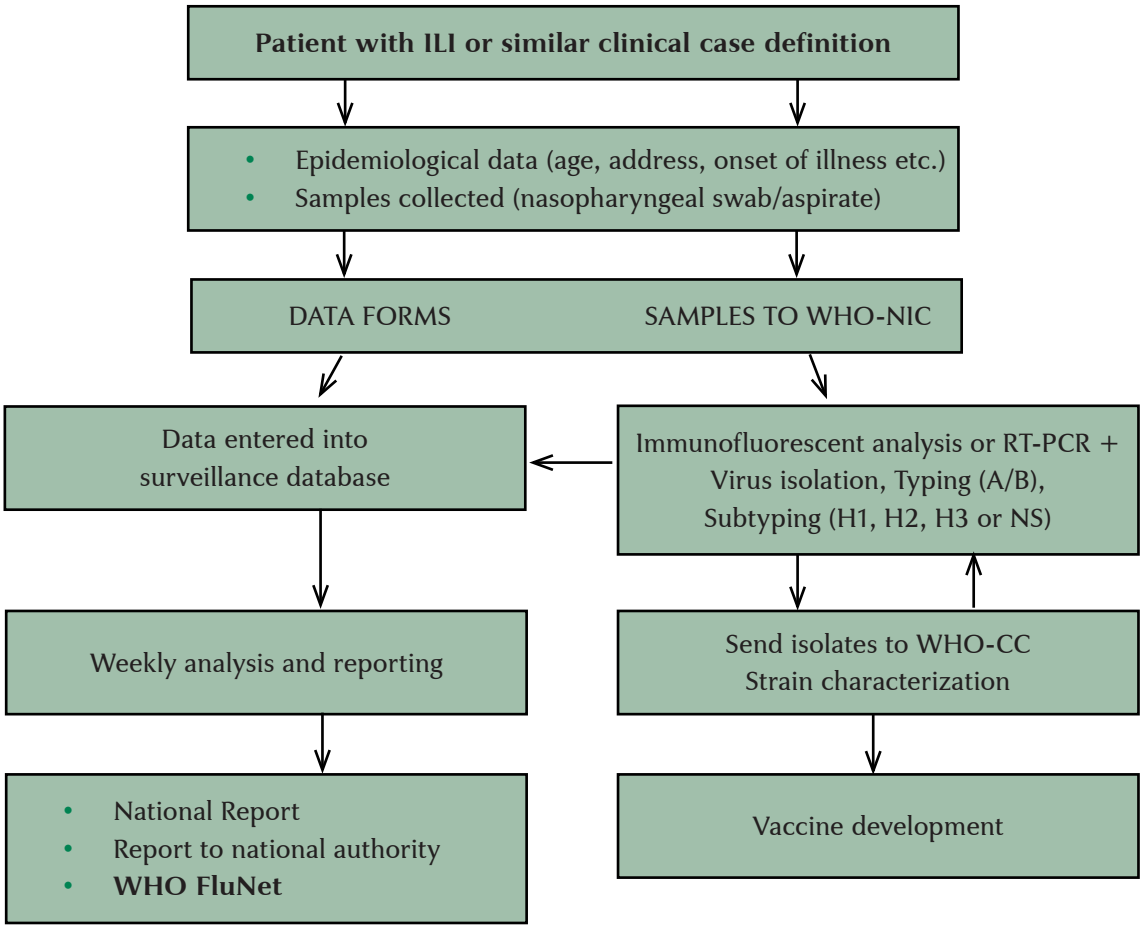
It is strongly recommended that analysis of any specimen that may be of pandemic potential be carried out in a separate area/room from where the routine influenza samples are analysed. This is to avoid possible reassortment of viruses in the laboratory setting.

6.1 Role of referral laboratories (L2) LabNet

Although PICTs are not likely to be the origin of the pandemic, they will be still highly exposed to the introduction of the pandemic virus, considering the speed of air travel and the frequency of sea voyages. As has been explained in Chapter 5, there is a need to strengthen the capacity of local surveillance to enhance efficiency of early warning systems and virologic surveillance during prepandemic and pandemic phases. Thus laboratory services are an integral part of the pandemic preparedness strategy. Figure 3 illustrates a flowchart for virologic surveillance and reporting.

As part of preparedness tools for the threats of influenza pandemic, national laboratories should have the capacity to perform some preliminary tests: e.g. Capillia or Directigen. Realising the limitations of these tests, the specific procedures needed in order to get a worthwhile result should be understood by laboratory technicians and laboratory managers. For example: through LabNet PICTs can be assisted by laboratory experts from NIC or/and WHO-CC, Melbourne. These test kits are mainly to assist with the confirmation of influenza outbreak, while isolates are needed to be sent for further typing and isolation of the responsible virus.

Figure 3: Flowchart for virologic surveillance and reporting



Keys:
NIC=National Influenza Centre
WHO-CC=World Health Organization Collaborating Centre for Reference and Research on Influenza
RT-PCR= reverse transcriptase polymerase chain reaction
NS= non-typeable specimen

Pandemic phase

When pandemic strains are in neighbouring countries (outside the region or your country)

As described in the PPHSN influenza preparedness guidelines in laboratory section, during the interpandemic surveillance, the technical procedures for sample collection and testing should remain the same. Virologists or laboratory technicians in charge should verify that their reagents and procedures are valid for the detection of the virus. It is the responsibility of the regional WHO-CC in collaboration with NICs to provide information and assistance to achieve this validation and to propose new lab strategies if needed.

Where there is no laboratory-based surveillance, it is recommended that the country be provided with rapid tests for the screening of clinically suspect patients. This will give strong indications of whether an outbreak is confirmed or not, but it has been found that access to rapid tests encourages enthusiasm to provide more influenza isolates for subtyping and antigenic

characterisation.[56] The rapid tests should be preferably the ones recommended or provided by WHO, which will ascertain the high specificity and sensitivity of the reagent to the new virus.

It must be emphasised that it is of the utmost value for laboratory staff members to acknowledge and follow the infection control procedures while dealing with the suspected highly infectious specimens. The same applies to the clinician or laboratory staff who will be taking the specimens from the patients (Annex 3).

Speed of laboratory confirmation may determine the rate of implementation of control measures. Thus, countries should ensure facilitation of procurement and transfer of isolates through relevant laboratory network for rapid identification of strains.

When pandemic strains are in the country

When there is evidence that the pandemic strain has reached the island/country, the laboratory investigations are not considered a priority any more. Considering the potentially high attack rate, the clinical case definition should be enough for the diagnosis. The case definition used for interpandemic periods should be revised according to the specific pathogenicity of the new strain.

Selected cases of particular interest, such as atypical presentations or residence in a previously confirmed influenza-free area of the country, should be laboratory tested to confirm the aetiology. This may be of interest, too, for virologic monitoring of the outbreak. Specimens of this type and/or others as indicated must be sent to NIC or to WHO-CC for monitoring of pandemic viruses.

Even if the pandemic phase has been declared over, patients presenting with ILI or any outbreaks of suspected viral origin need to be laboratory-confirmed. These results should be provided to the PacNet and WHO FluNet for wider dissemination, and they will assist with global monitoring of the pandemic.[55] At the time of a pandemic, updating on these findings may help to alleviate fear and panic of the public at large.

6.2 Participation in global surveillance

In PICTs there are limited laboratory facilities that perform tests for virus isolation. These facilities should assist WHO-CC by sending specimens where influenza strains are isolated during a pandemic event. The characterizations of such strains are needed for screening variants of the new strain for designing appropriate vaccines.

The reporting of lab data during and after a pandemic should be provided to FluNet to assist in the continuous monitoring of the global influenza situation.

Procedure of reporting

It is recommended that national and international reporting systems should take into account the new international health regulations (IHR).

Periodicity

When a pandemic virus strain is confirmed to be in the country, grouped clinical cases or the first laboratory confirmed case should be immediately reported, as this could be the signal that an outbreak has begun (Fig. 3). The report should go to the Chairperson of CDCC, and it is the responsibility of the CDCC to inform the government and their working partners to set the ball rolling, especially setting into motion the communication/media strategy. The declaration of the threat or the event of inevitable pandemic must be followed by activating the pandemic plan as well as the contingency plans.

At the early stages of introduction, it is recommended that daily reports are collected and collated by the central level of the Ministry or Department of Health before they are provided to relevant parties.

Data collected should include at least:

- epidemiological case(s): personal particulars: name, age, residence/address, occupation specific exposure risk (i.e. poultry workers; mixed-animal farmers), possible contact (anyone else sick at home or workplace or school)
- symptoms and signs, especially in severe clinical presentations
- recent travel history and vaccination status (if applicable).

Feedback

When an outbreak is confirmed, the health authorities and CDCC should be informed first, and as mentioned above.

Reporting should be regularly provided to PacNet, WHO/SP or WPRO office, and to FluNet for the international dissemination and monitoring of the situation.

7. RISK-COMMUNICATION STRATEGIES

The threat of SARS to PICTs in 2003 prompted national responses to a highly infectious situation threatening the whole country, an experience which was a lesson for the even worse scenario of a pandemic. Considering some of the differences between SARS and influenza in the epidemiology of the disease, and the likely impact of a substantial influenza pandemic as had occurred in the past, PICTs preparedness to respond to SARS pales when compared to the likely impact that a substantial flu pandemic can possibly cause.

Everyone is vulnerable, and rumours or unsubstantiated stories can create more panic, fear and unnecessary hysteria among people of communities and the country. Thus, the CDCC and its working partners should make sure that a risk-communication strategy is established and can be immediately made operational in an increasing intensity during consecutive pandemic phases (as in the contingency plan). It should be part of the country's situation assessment to identify the most appropriate and effective media that can be utilized, and then build the media risk-communication strategy.

The CDCC in consultation with the government and other stakeholders should nominate a communication adviser who possesses communication skills and technical knowledge of the issues, someone who is a member of the CDCC, and they then decide on the number of official spokesperson(s) as per that country's jurisdictions. It is advisable to identify an official spokesperson(s) during the interpandemic phase who will continue to carry out that task during the other phases of the pandemic. CDCC, the communication adviser and the spokesperson will concur on the need to increase the number of spokesperson(s) according to jurisdiction, and other related matters. These spokesperson(s) are from the MOH component and animal health component of the CDCC. They are responsible for imparting information to the public on influenza and related issues. These individuals may also be members of the risk-communication team during the other phases of the pandemic.

The sources of information should be credible and acceptable to the public — e.g. WHO, CDC, FAO and such — and the spokesperson(s) would best be someone associated with authority. In PICTs where everyone knows almost everybody else, this may be a crucial factor for the success of the risk-communication strategy in imparting information, and in alleviating fear and panic by the public. Any negative reporting should be dealt with as soon as possible.

7.1 Interpandemic phase

Surveillance information on influenza from national, regional and global sources on human or animal influenza should be imparted to the public consistently by the identified spokespersons as in the routine human health or animal health programmes. Perhaps weekly updates may be warranted, especially during this period when avian influenza outbreaks are still ongoing in the Asian countries.

In countries where there is an WHO/CLO office, the CLO can assist the delegated spokesperson(s) with the international and regional updates on influenza and related issues.

He/she is also a member of the CDCC. The local routine surveillance information on influenza or any other outbreak-prone diseases should be equally shared with the general public to assist them in the understanding of their epidemiology, and to further promote their willingness to participate in the national preparedness plan.

It is absolutely essential that a media strategy be developed, and that the content of productions and publications are tailored in accordance with both local and national situations. A subgroup of media experts is called upon by the communication adviser, and together with the official spokesperson(s), they develop their workplan. Their workplan is to be presented to CDCC for endorsement. The workplan is tailored according to pandemic phases, and further details can be discussed with other stakeholders as the situation arises.

7.2 Prepandemic phase

According to the WHO pandemic phase schedule (http://www.who.int/csr/resources/publications/influenza/WHO_CDS_CSR_EDC_99_1/en/) and presuming that the pandemic strains mutate from avian or animal species, outbreaks with potential pandemic strains are identified in animals/birds (0.1), potential pandemic strains are identified to be transmitted from animals/birds to humans (0.2) and from human to human (0.3). At this stage, risk-communication strategies should be reviewed. Risk communication with all stakeholders should be initiated and tailored accordingly (refer to Table 2).

The primary objectives of the risk-communication strategy include facilitation of better preparedness of the nation to face the risk of the threat or event of an influenza pandemic through provision of accurate and updated information. People make more rational decisions when these are based on updated and accurate information of the situations, and it is more likely that it is at this phase that preparation should be intensified: this is because when the pandemic phase arrives, situations in the local scene may be more disruptive and can interrupt rational thinking.

These activities are part of the risk-communication strategies:

- Advanced preparation and dissemination of a brochure outlining the roles of government in partnership with CDCC. This may promote confidence of the people in their governments and what the CDCC is taking lead role in.
  - It is also vitally important that in this brochure, the government through CDCC is recognizes and requests the full involvement and participation of the people, either individually as members of the civil society or in an organization, institution or group in this preparedness effort.

- Fact sheets and frequently asked questions for media/health practitioners and the public should be disseminated via newspapers, newsletters, internet/websites, or emails. The content of the sheet can be aired either in radio and TV.
  - Fact sheets may contain facts about how the disease is presented, causative aetiology, how transmitted, how to care for a patient at home, what actions to take to minimize transmission, complication of diseases, and when to refer including information on where (location of centre of care for districts or area), how (phone: cell or home/pager numbers) and who (if necessary: roster for shifts) to contact for health and medical services.

  - Facts about relevant public health interventions both nonpharmaceutical and pharmaceutical, like the need and procedures for home isolation and why not an institutional isolation; why there should be closure or no closure of schools, public gatherings; why only emergency and not elective surgery; why certain subgroups in population have priority to receive vaccines (or antivirals if available). These have to be clarified, otherwise more chaos will lie ahead.

- A one-day meeting workshop of a key communication/media representative from the CDCC with local media people and some members from CDCC and medical/health professionals:
  - to discuss and publicize the availability of the brochures
  - to foster the feeling by media people of being a part of the pandemic preparedness plan for their country, and of being responsible for imparting accurate and timely information to their people to facilitate alleviation of fear and panic
  - to promote commitment from media people for non-sensational, responsible reporting of a country's or territory's preparedness status and response level to the pandemic event.

- The health-care professionals need to be prepared not only professionally but also psychosocially to deal with the likely upcoming huge commitment of taking care of highly infectious patients with great risk that is not just to them but to others they come into contact with.
  - Communications with and among health-care workers should be on a regular basis through clinical meetings (regular clinical and/or mortality meetings that some PICTs conduct on either a weekly or monthly basis can be utilized for this purpose), fact sheets discussions and updating, internet/website and email contacts, bulletins, articles or through medical magazines. They can be involved in radio and TV programmes or community programmes relating to pandemic issues.
  - How and where to access counselling services should be made known to HCW during the above communications. Key contact persons or HCW individuals should be identified to facilitate transmission of information.

- A daily analysis of international and regional news may assist in development of a national communications strategy.

- Frequent meetings, daily or weekly or as decided by the team, to update team members on the development of the pandemic globally, and what and how to impart information to the public.

- It is important to keep an open dialogue with representatives of the media at all times as they are an important and efficient means of getting information to a wide range of people in a short time.

7.3 Pandemic phase

As the demand for information during a pandemic will be enormous, and because people may panic out of fear and uncertainty about what is happening locally and abroad, the government through its CDCC and risk-communication team should be fully informed at all times.

- Accurate and updated information should be made available in an appropriate and timely manner, and of course all the other related activities in the field should be happening as planned.
- Information management is very crucial to sustain the public's confidence in the system over the period of pandemic waves. It should aim not only at meeting the demand for information but also at acknowledging the limits of what the government and its working partners can do, and it should use consistent and complementary messages.
- The official spokesperson(s) should have daily meetings or updates with the media people, providing updates from the government and sharing the information that has been collected from various credible sources regionally and internationally. In this way, information is standardized and updated and, through different media people, dissemination will be fast and accurate.
- The government through its CDCC should also be updated on daily basis on the development of the pandemic.
- There should be press conferences on a weekly basis or as need be. These can be broadcasted via radio or television. A very senior official as well as the spokesperson(s) may be at the scene.
- Risk communication with health-care workers is very important. A responsible person from the MOH should be assigned to be part of the daily update sessions with the risk-communication and media teams. The same applies to a delegated communication representative from the animal health services.

Telecommunication and related communication companies can be approached for assistance in setting up a healthline, a 24-hour health and information advice line to guide people to the most appropriate form of care of symptoms of influenza. This service can be set up as an extension to existing lines to hospitals or specific health-care settings where there is already a 24-hour service running, similar to that for nursing staff or doctors' work shifts.

It is also imperative that counselling services for health-care workers or other emergency workers be set up either at the hospital site or in every community. In some of PICTs where there are no social security services or trained counsellors, some key people in the community like religious pastors and their wives or NGOs can offer counselling services in their respective settings.

8. CONTINGENCY PLANS BY PANDEMIC PHASES

Throughout earlier chapters in these guidelines, information has been provided to facilitate planners including EpiNet teams and CDCC in selection of issues and processes for adaptation and adoption in development of national pandemic preparedness guidelines. The matrix on elements of contingency plan by pandemic phases provided in this chapter presents an option of how to outline national activities by pandemic phases. Each PICT can fill in specific tasks and responsibilities, even source of funding, in accordance with national capacities and resources.

One of the aims of these guidelines is to stimulate planners to develop a simple and comprehensive contingency plan to cover all aspects of a national response to threats or to an event of highly infectious disease; it should be feasible and affordable to implement, and it should have strategies or activities ready to be activated within a short period of time. For example: legal and ethics issues need to be addressed well ahead to make sure that legislation is in place to support public health measures, especially those that may create dissatisfaction and raise many questions in the minds of the people of the community, for example legislation that declares influenza as a notifiable disease. Such legislation gives legal authority to an individual with the appropriate portfolio (e.g. Minister of Health or similar) to exercise when decisions are reached to declare a sanction on an activity because of the high likelihood that that activity will jeopardize the common good of the community. Banning of public assemblies may be a public health intervention that needs to be implemented to minimize faster and wider transmission of the virus; border control surveillance may require that immigration not grant visas to people from affected areas when pandemic phase is 0.3 even though human-to-human transmission has not yet been confirmed in the country.

The framework for a contingency plan by pandemic phase is as in Table 2 below.

Table 2: Elements of contingency plan by pandemic phases (adapted from WHO)

PANDEMIC PHASES		PICT AFFECTED	ACTIVITIES				
Phase	**Level**	**Yes or no**	**Surveillance**	**Public health measures**	**Health-care services care**	**Communication**	**Other essential services**
0	**0**	**(INTERPANDEMIC)**	**ROUTINE INFLUENZA PATTERN IN HUMANS AND ANIMALS**				
			ILI case definition and surveillance Sentinel (+virological) surveillance Surveillance for clusters of dead birds/animals	Routine (as per country/territory)	Routine Develop manuals for management of influenza disease and complications Develop infection control guidelines	Routine (regular health awareness programs)	Routine
			Establish or activate CDCC or similar committee				
Responsible agent(s)			MOH, Ministry of Agriculture (MOA)	MOH	MOH	MOH, MOA	All
0	**1**	**(PREPANDEMIC)**	**INFLUENZA STRAINS WITH PANDEMIC POTENTIAL IDENTIFIED IN ANIMALS/BIRDS**				
		NO	Early warning systems (EWS) Border control – seaports inspection of vessels from affected countries with live animals /birds	Legal and ethical issues. Check legislation/policy on quarantine is in place. Decision on imported food products from affected areas		Share information on avian influenza outbreaks via media	Disposal plan for carcasses of animal/ poultry – discuss with farms
Responsible agent(s)			MOH, MOA, Immigration /CDCC	MOH, MOA, Ministry of Justice (MOJ) / CDCC	MOH / CDCC	MOH, MOA / CDCC	Dept. of Environment and Sanitation (DES), MOA / CDCC

PANDEMIC PHASES		PICT AFFECTED	ACTIVITIES				
Phase	**Level**	**Yes or no**	**Surveillance**	**Public health measures**	**Health-care services care**	**Communication**	**Other essential services**
		YES	EWS Enhanced virological surveillance: send isolates to WHO-CC centres for strain isolation (& ?vaccine development)	Legal and ethical issues. Check legislation/policy on quarantine is in place. Decision on vaccination and antiviral policy		Production of fact sheets/brochures Share information with media weekly	Activate disposal plan
Responsible agent(s)			MOH, MOA / CDCC	MOH / CDCC	MOH / CDCC	MOH, MOA / CDCC	
0	**2**	**INFLUENZA STRAINS WITH PANDEMIC POTENTIAL IDENTIFIED IN HUMANS**					
		NO	EWS Enhanced surveillance– epidemiological and virological	Legal framework in place in support of possible sanctions of: public meeting or school closures; isolation Prioritizing groups for vaccine and antivirals (if applicable)	Take stock of hospital available facilities/ beds/ medication e.g. antibiotics/fluid List staff (govt & NGOs) and volunteers per discipline Identify regional workforce back-up (inter-country) Assess infection control capacity Review infection control manuals Ensure availability of protective equipment for HCW, laboratory technicians	Sharing of updated information from regional/international developments Production of brochures/fact sheets Communication adviser and official spokesperson identified	
Responsible agent(s)			MOH, MOA / CDCC	MOH, MOJ / CDCC	MOH / CDCC	MOH, MOA / CDCC	

PANDEMIC PHASES		PICT AFFECTED	ACTIVITIES				
Phase	**Level**	**Yes or no**	**Surveillance**	**Public health measures**	**Health-care services care**	**Communication**	**Other essential services**
		YES	Enhanced surveillance on cluster investigation: ILI case definition review (epidemiological data) Viral isolates	As for "NO"	As for "NO"	As for "NO" Activate risk communication plan	
Responsible agent(s)			MOH, MOA / CDCC	MOH/MOJ / CDCC	MOH / CDCC	MOH / CDCC	
0	**3**	**CONFIRMED HUMAN TO HUMAN TRANSMISSION OF THE STRAIN WITH PANDEMIC POTENTIAL**					
		NO	EWS Enhanced surveillance Border control – both air and sea	Discourage travel to and from countries with human infections with pandemic potential virus	Review list of logistics with regards to hospital facilities, lab services, dispensaries, and others Review list of health workers, auxillary staffs, volunteer workers Set up mechanism for monitoring side-effects of vaccines (if available) Mortuary services informed and ready	Weekly updates from regional and international sources CDCC to share information with the public via media spokesperson Brochures/Fact Sheets Media coverage is increased Establishment of hotline services; identify personnel to provide counselling services throughout the community	
Responsible agent(s)			MOH, MOA, Immigration / CDCC	MOH / CDCC	MOH / CDCC	MOH / CDCC	MOH / CDCC

PANDEMIC PHASES		PICT AFFECTED	ACTIVITIES				
Phase	**Level**	**Yes or no**	**Surveillance**	**Public health measures**	**Health-care services care**	**Communication**	**Other essential services**
		YES	Enhanced surveillance – epidemiological and virological Multiple sites for surveillance e.g. hospitals/ nursing homes	Discourage or ban public gatherings/ school closure if indicated Consider alternative transient hospital shelter if needed	As for "NO" Apply what has been produced in the clinical management, infection control and other protocols	Daily updates between communication/ media and clinical/ CDCC chair/ before disseminating information to public	
Responsible agent(s)			MOH / CDCC	MOH, MOJ, DES CDCC	MOH / CDCC	MOH/ CDCC (official spokespersons)	
1		**(PANDEMIC)**	**INFLUENZA PANDEMIC CONFIRMED - DECLARED BY WHO**				
		NO	Enhanced surveillance– epidemiological and virological	Prepare to activate national influenza plan strategy	Prepare to activate national influenza contingency plan	Prepare to activate appropriate component in national influenza contingency plan	Prepare to activate appropriate component of national contingency plan
Responsible agent(s)			MOH/ CDCC	MOH/ CDCC	MOH/ CDCC	MOH/ CDCC	All/ CDCC
		YES	Return to routine & sentinel surveillance only Viral isolates for monitoring of pandemic and to assist in viral analysis and vaccine development Morbidity and mortality monitoring	Activate national influenza plan strategy, including antivirals to identified population subgroups if possible	Activate national influenza contingency plan	Activate appropriate component in national influenza contingency plan, incl. daily meetings between official spokesperson with media for updates gathered from local sites, regional and global	Activate appropriate component of national contingency plan
Responsible agent(s)			MOH/ CDCC	MOH/ CDCC	MOH/ CDCC	MOH/ CDCC	All/ CDCC

PANDEMIC PHASES		PICT AFFECTED	ACTIVITIES				
Phase	Level	Yes or no	Surveillance	Public health measures	Health-care services care	Communication	Other essential services
2		MULTICOUNTRY/ REGIONAL OUTBREAKS OF PANDEMIC INFLUENZA STRAINS WITH EFFICIENT HUMAN-TO-HUMAN TRANSMISSION					
		NO	Enhanced surveillance– epidemiological and virological	Prepare to activate national influenza plan strategy	Prepare to activate national influenza contingency plan	Prepare to activate appropriate component in national influenza contingency plan	Prepare to activate appropriate component of national contingency plan
Responsible agent(s)			MOH/ CDCC	MOH/ CDCC	MOH/ CDCC	MOH/ CDCC	All/ CDCC
		YES	Return to routine & sentinel surveillance only Viral isolates for monitoring of pandemic and to assist in viral analysis and vaccine development Morbidity and mortality monitoring	Activate national influenza plan strategy, including antivirals to identified population subgroups if possible	Activate national influenza contingency plan	Activate appropriate component in national influenza contingency plan, incl. daily meetings between official spokesperson with media for updates gathered from local sites, regional and global	Activate appropriate component of national contingency plan
Responsible agent(s)			MOH/ CDCC	MOH/ CDCC	MOH/ CDCC	MOH/ CDCC	All/ CDCC
3		END OF FIRST PANDEMIC WAVE – NO INCREASE IN COUNTRIES AFFECTED INITIALLY BUT OUTBREAKS OCCURRING ELSEWHERE IN THE WORLD					
			Review surveillance information (epidemiological and virological) from the past pandemic event			Official spokesperson and Chairperson of CDCC to announce end of pandemic wave according to WHO declaration	
			Get prepared for the next pandemic waves				
Responsible agent(s)				MOH/ CDCC	MOH/ CDCC	MOH/ CDCC	All/ CDCC

PANDEMIC PHASES		PICT AFFECTED	ACTIVITIES				
Phase	Level	Yes or no	Surveillance	Public health measures	Health-care services care	Communication	Other essential services
4		SECOND OR LATER WAVE OF THE PANDEMIC (WHO will declare the onset – usually caused by a new strain of virus)					
		NO	Enhanced surveillance continues– epidemiological and virological Isolates are sent to NIC or WHO CC Reviewed ILI definition used in ILI surveillance	Implement public health activities based on review from previous pandemic Immunization of identified population groups if possible	Continue with reviewed response plan from the last phase	Announce nationally by CDCC chairperson and/or official communication adviser the beginning of a new phase of pandemic as according to WHO Continue applying communication strategy	
Responsible agent(s)			MOH/ CDCC	MOH/ CDCC	MOH/ CDCC	MOH/ CDCC	All/ CDCC
		YES	Return to routine & sentinel surveillance only Viral isolates for monitoring of pandemic and to assist in viral analysis and vaccine development Morbidity and mortality monitoring	As for "NO" Activate national influenza plan strategy, incl. antivirals to the identified population groups if possible	As for "NO" Activate national influenza contingency plan	As for "NO"	
Responsible agent(s)			MOH/ CDCC	MOH/ CDCC	MOH/ CDCC	MOH/ CDCC	All/ CDCC

PANDEMIC PHASES		PICT AFFECTED	ACTIVITIES				
Phase	Level	Yes or no	Surveillance	Public health measures	Health-care services care	Communication	Other essential services
5		END OF THE PANDEMIC (BACK TO PHASE 0)					
			Activities as in Phase 0 level 0 May need to modify ILI case definition according to latest finding Continue virological surveillance and continue sending isolates to NIC/WHO CC			Announce end of pandemic and return to normal following the above Information from the analysis of the pandemic relayed to public Relevant information relayed to relevant stakeholders e.g. local organization (financial analysis), press, PacNet, FluNet	
Responsible agent(s)			MOH/ CDCC			MOH/ CDCC	

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ANNEX 1: INFLUENZA LANDMARKS IN HUMANS IN THIS CENTURY

YEAR	COLLOQUIAL NAME AND SUBTYPE	SOURCE	IMPACT
1918	Spanish flu (H1N1 viruses like swine flu)	Possibly emergence from swine or an avian host of a mutated H1N1 virus	Pandemic with >20 million deaths globally
1957	Asian flu (H2N2)	Possibly mixed infection of an animal with human H1N1 and avian H2N2 virus strains in Asia	Substantial pandemic H1N1 virus disappeared
1968	Hong Kong flu (H3N2)	High probability of mixed infection of an animal with human H2N2 and avian H3Nx virus strains in Asia	Substantial pandemic H2N2 virus disappeared
1976	Swine flu (H1N1)	US/New Jersey. Virus enzootic in US swine herds since at least 1930	Localized outbreak in military training camp, with one fatal case
1977	Russian flu (H1N1)	Source unknown, but virus is almost identical to human epidemic strains from 1950. Reappearance detected at almost the same time in China and Siberia	Benign pandemic, primarily involving persons born after the 1950s. H1N1 virus has cocirculated with H3N2 virus in humans since 1977
1986	H1N1	The Netherlands. Swine virus derived from avian source	One adult with severe pneumonia
1988	Swine flu (H1N1)	US/Wisconsin. Swine virus	Pregnant woman died after exposure to sick pig
1993	H3N2	The Netherlands. Swine reassortant between “old” human H3N2 (1973/75–like) and avian H1N1	2 children with mild disease. Father infected by pigs suspected to be the transmitters
1995	H7N7	United Kingdom. Duck virus	One adult with conjunctivitis
1997	Chicken flu (H5N1)	Hong Kong SAR. Poultry	18 confirmed human cases, 6 lethal
1999	H9N2	China, Hong Kong SAR. Quail influenza-like virus	2 human cases with mild disease
2003	Bird flu (H5N1)		34 confirmed cases, 22 lethal

Source: Adapted from WHO http://www.who.int/csr/resources/publications/influenza/WHO_CDS_CSR_EDC_99_1/en/

ANNEX 2: WHO COUNTRY PANDEMIC PREPAREDNESS CHECKLIST (draft)

CHECKPOINTS	ESSENTIAL	DESIRABLE	PRIORITY
Getting started			
Interpandemic surveillance			
Early warning systems			
Pandemic surveillance			
Local laboratory capacity			
Referral laboratory availability			
Risk assessment			
Routine flu vaccine program			
Antiviral drugs for pandemic			
Pneumococcal vaccines			
Health service contingency plan			
Essential services contingency plans			
Public health measures			
Communication strategies			
Legal and ethical issues			
Response plan by pandemic phases			
Testing and revision of pandemic plan			
Evaluation and research			
Debriefing			

ANNEX 3: USEFUL WEB ADRESSES

- WHO: Influenza: Prevention and control of influenza pandemics and annual epidemics: Resolution. http://www.who.int/gb/ebwha/PDF-files/WHA56/ea56r19.pdf

- CDC: Guideline for isolation precautions in hospitals. http://www.cdc.gov/ncidod/hip/isolat/isolat.htm

- CDC: Respiratory hygiene cough etiquette in healthcare setting. http://www.cdc.gov/flu/professionals/infectioncontrol/resphygiene/htm

- WHO: Consultation on priority public health interventions before and during an influenza epidemic. http://www.who.int/csr/disease/avian_influenza/consultation/en/

- WHO: Communicable Disease Surveillance and Response (CSR): influenza. http://www.spc.int/csr/disease/influenza/

- WHO: Influenza Pandemic Preparedness Checklist (draft Nov 2004). http://www.wpro.who.int/avian/docs/checklist formattedana _2a_.pdf

- WHO: Health Sector Emergency Preparedness Guide. http://www.who.int/disasters/repo/5814.doc

- WHO: Guidelines, recommendations, descriptions regarding HPAI (H5N1). http://www.who.int/csr/disease/avian_influenza/guidelines/en/

- WHO: Prevention of hospital-acquired infections - A practical guide - 2nd Edition. http://www.who.int/csr/resources/publications/drugresist/en/whocdscsreph200212.pdf

- WHO: Influenza Pandemic Plan. The Role of WHO and Guidelines for National and Regional Planning. http://www.who.int/csr/resources/publications/influenza/en/whocdscsredc991.pdf

- CDC: Influenza Infection Control in Health-Care Facilities. http://www.cdc.gov/flu/professionals/infectioncontrol/

- CDC: Useful planning softwares: FluSurge: http://www.cdc.gov/flu/flusurge.htm
  FluAid: http://www2.cdc.gov/od/fluaid/default.htm