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)

2005

Published by the Secretariat of the Pacific Community
with financial assistance from France and NZAID (through PREPARE project)

SPC Secretariat of the Pacific Community

Liberté • Égalité • Fraternité
RÉPUBLIQUE FRANÇAISE

nzaid

Original text: English

Secretariat of the Pacific Community Cataloguing-in-publication data

Pacific Public Health Surveillance Network (PPHSN) guidelines for influenza preparedness and control and influenza pandemic preparedness / prepared by Dr Seini Kupu in consultation with the PPHSN Influenza Specialist Group (ISG)

1. Influenza – Epidemiology. 2. Influenza – Prevention. 3. Respiratory diseases – Prevention. 4. Public Health – Oceania.
I. Title. II. Secretariat of the Pacific Community.

614.518 AACR2
ISBN 982-00-0061-0

This publication may be cited as:
Kupu, S. 2005. PPHSN guidelines for influenza preparedness and control and influenza pandemic preparedness. Noumea, New Caledonia: Secretariat of the Pacific Community.

Secretariat of the Pacific Community
BP D5, 98848 Noumea Cedex
New Caledonia
Telephone: +687 26 20 00
Facsimile: +687 26 38 18
Email: spc@spc.int
http://www.spc.int

Prepared for publication at the
Secretariat of the Pacific Community and printed by MultiPress
Noumea, New Caledonia, 2005

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

CONTENTS

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.

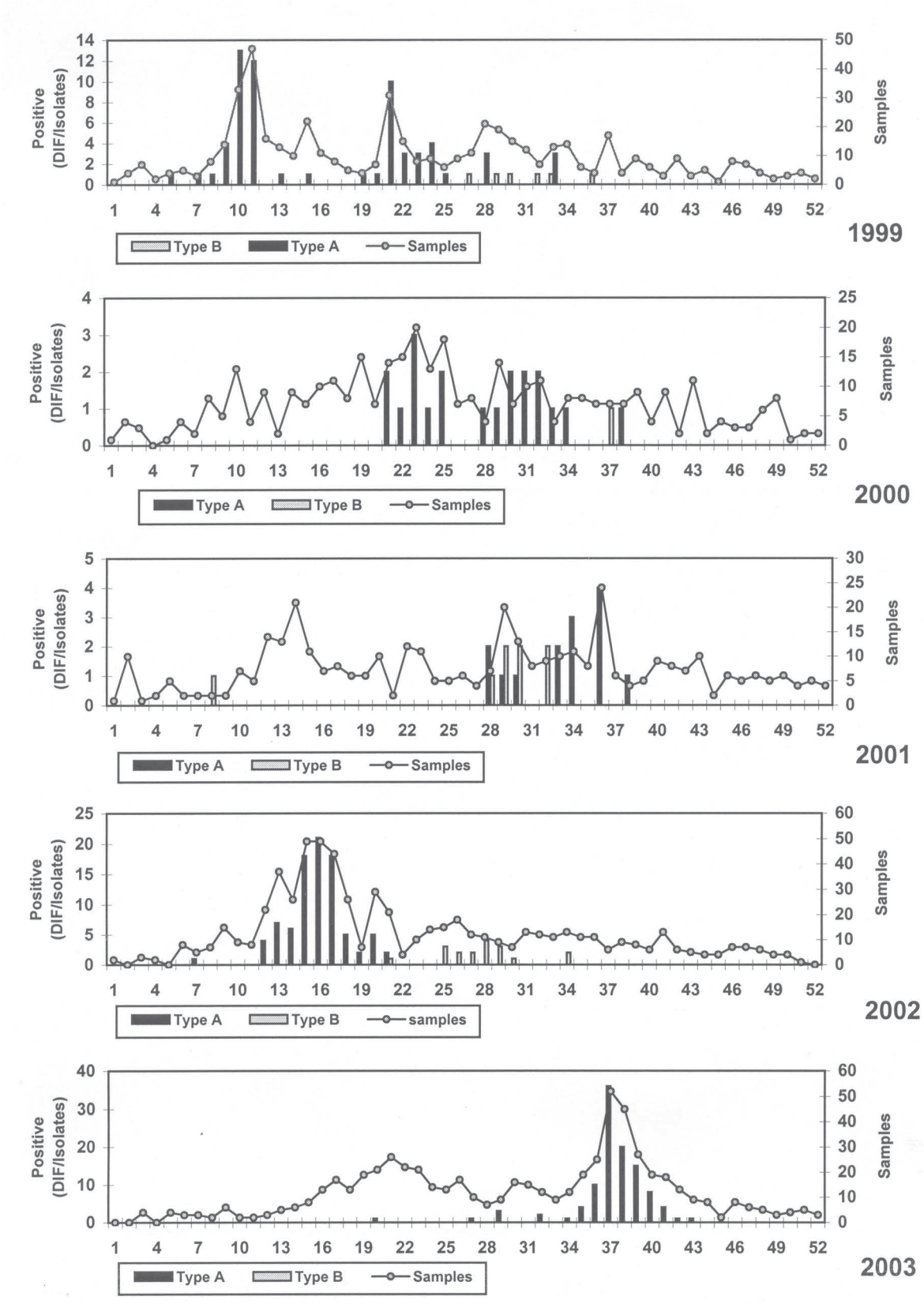
3.1.1 Influenza pandemic

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

1. Example documents on Influenza Pandemic Plan included in the CD-ROM distributed during the First Regional EpiNet Workshop, Building on the SARS Experience – Preparing PPHSN for Emerging and Re-Emerging Infectious Diseases, Suva, Fiji Islands, 1–5 September 2003.
2. Technical Report Series No.4. A framework for an Australian Influenza Pandemic Plan. June 1999. Influenza Pandemic Planning Committee of the Communicable Disease Network Australia New Zealand, Version 1, June 1999. http://www.who.int/csr/disease/influenza/en/influenza.pdf
3. Snacken, R., Kendal, A.P., Haaheim, L.R., Wood, JM. 1999. The Next Influenza Pandemic: Lessons from Hong Kong, 1997. Emerging Infectious Diseases 5(2), March –April.
4. Ireland Government. 2001. A Model Plan for Influenza Pandemic Preparedness. Version 3.1, September.
5. Tomkins, S.M. 1992. The influenza pandemic of 1918-1919 in Western Samoa.The Journal of Pacific History 27(2):181-197.
6. Hillingdon Health and Social Care Economy: Influenza Pandemic Contingency Plan: Revised Draft of 16 August 2001.
7. WHO: Weekly epidemiological record no.7, 2004, 79, 65-76. http://www.who.int/wer/
8. WHO: Avian Influenza A (H5N1) – Updates. http://www.who.int/csr/don/2004_02_09/en/
9. WHO Recommended Surveillance Standards, 2nd ed. – Oct. 1999.WHO Influenza Pandemic Preparedness Plan. WHO Geneva 1999. http://www.who.ch/flunet
10. World Health Organization. Avian Influenza Fact Sheet. 15 January 2004. http://www.who.int/csr/don/2004_01_15/en/print.html
11. Queensland Government. Exotic animal diseases – Avian influenza. http://www.dpi.qld.gov.au/health/3941.html
12. Government Information Centre, Hong Kong. Prevention of avian influenza: what's new. Last revision date: January 30, 2004. http://www.info.gov.hk/info/flu/eng/
13. CDC: Influenza (Flu) Avian Influenza (Bird flu) Outbreak: 2003-2004. http://www.cdc.gov/flu/avian
14. WHO: Avian Influenza Frequently asked questions. http://www.who.int/csr/disease/avian_influenza/avian_faqs/en
15. World Organisation for Animal Health. http://www.oie.int/eng/AVIAN_INFLUENZA/home.htm
16. Taylor, R., Nemaia, H., Tukuitonga, C., Kennett, M., White, J., Rodgers, S., Levy, S., Gust, I. 1985. An epidemic of influenza in the population of Niue. Journal of Medical Virology 16:127.
17. Austin, V.J., Mataika, J.U. 1979. Influenza virus A(H1N1) in Fiji. New Zealand Medical Journal. September 26.
18. Darcy, A. 2004. Confirmed influenza outbreak in Honiara, Solomon Islands. PacNet posting, 6 May. PPHSN-CB focal point, Secretariat of the Pacific Community.
19. Koroivueta, J. 2004. Flu virus sweeps Fiji. Pacific Islands Report: Pacific Islands development Program. East West Center, University of Hawaii, March.
20. Berlioz-Arthaud, A., Barr, IG. 2004. 'Laboratory based influenza surveillance in New Caledonia:1999-2003.' Transactions of the Royal Society of Tropical Medicine & Hygiene. (In press).

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:
Members of the Influenza Specialist Group can be contacted through SPC's Public Health Surveillance and Communicable Disease Control section: Email: phs.cdc@spc.int.