

# Overview of pandemic preparedness

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**Australian Biosecurity CRC, Curtin University of Technology  
for Nursing/Midwifery Leadership Summit 2006:  
Building Leadership Capacity and Disease Prevention in the  
Western Pacific Region, November 29, 2006**

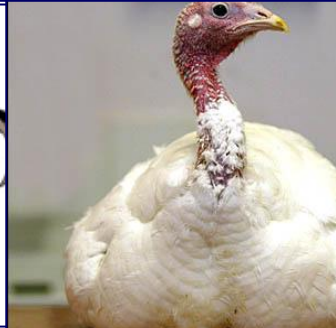
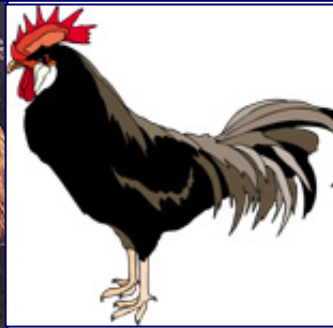
# Today

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- ❖ **Pandemic flu – background, why it matters**
- ❖ **What's happening? And some of the challenges**
- ❖ **The gaps in preparedness**
- ❖ **The benefits of planning (and being part of the process)**

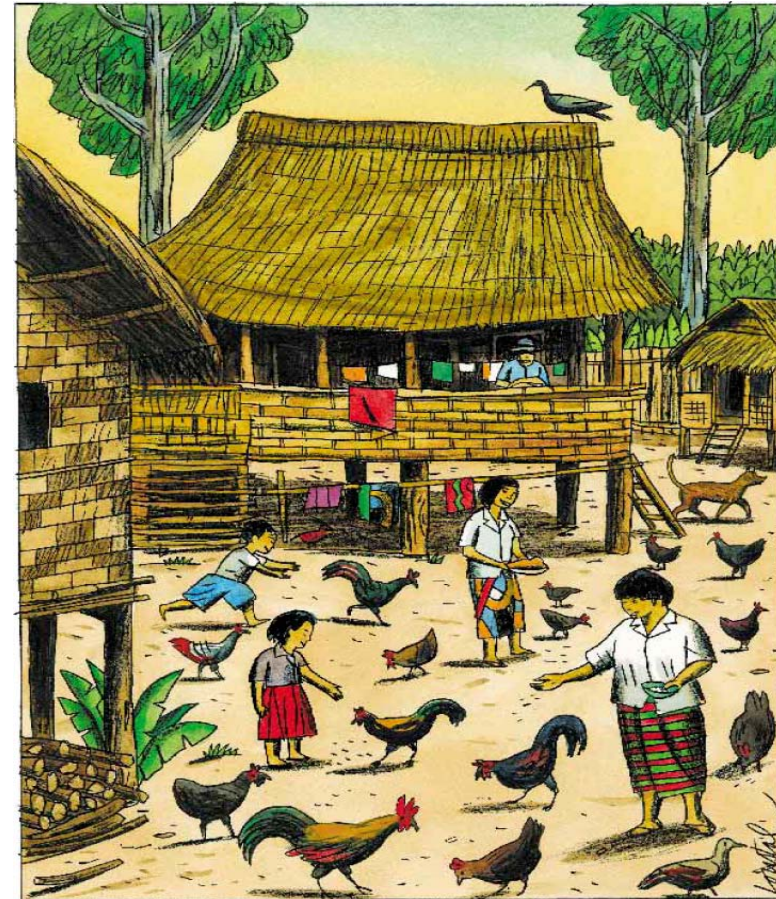
# What do you need for pandemic flu?

- A new strain infecting humans
  - Strain causing pathology
    - Efficient spread



# Avian influenza viruses

- All influenza viruses – undergo frequent, permanent antigenic changes
- Potential to swap or reassort genetic material with other viruses
- Can become ‘mixed’ in humans or pigs
- Can mutate and become more adapted to humans
- Current concern H5N1



THE NEW YORKER, FEBRUARY 28, 2005 5





# The voyage of the SS *Talune*

## A Pacific 1918 pandemic testimonial

On 30 October 1918, the ship left Auckland and 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.

**1918-19**

**1957-58**

**1968-69**

	<b>1918-19</b>	<b>1957-58</b>	<b>1968-69</b>
<b>Virus</b>	<b>H1N1</b>	<b>H2N2</b>	<b>H3N2</b>
<b>Spread</b>	<b>Explosive outbreaks</b>	<b>Explosive outbreaks</b>	<b>Slow spread</b>
<b>Mortality</b>	<b>Very high</b>	<b>Moderate</b>	<b>Low except for USA</b>
<b>Affected</b>	<b>Young adults</b>	<b>School children, Elderly later</b>	<b>Elderly</b>

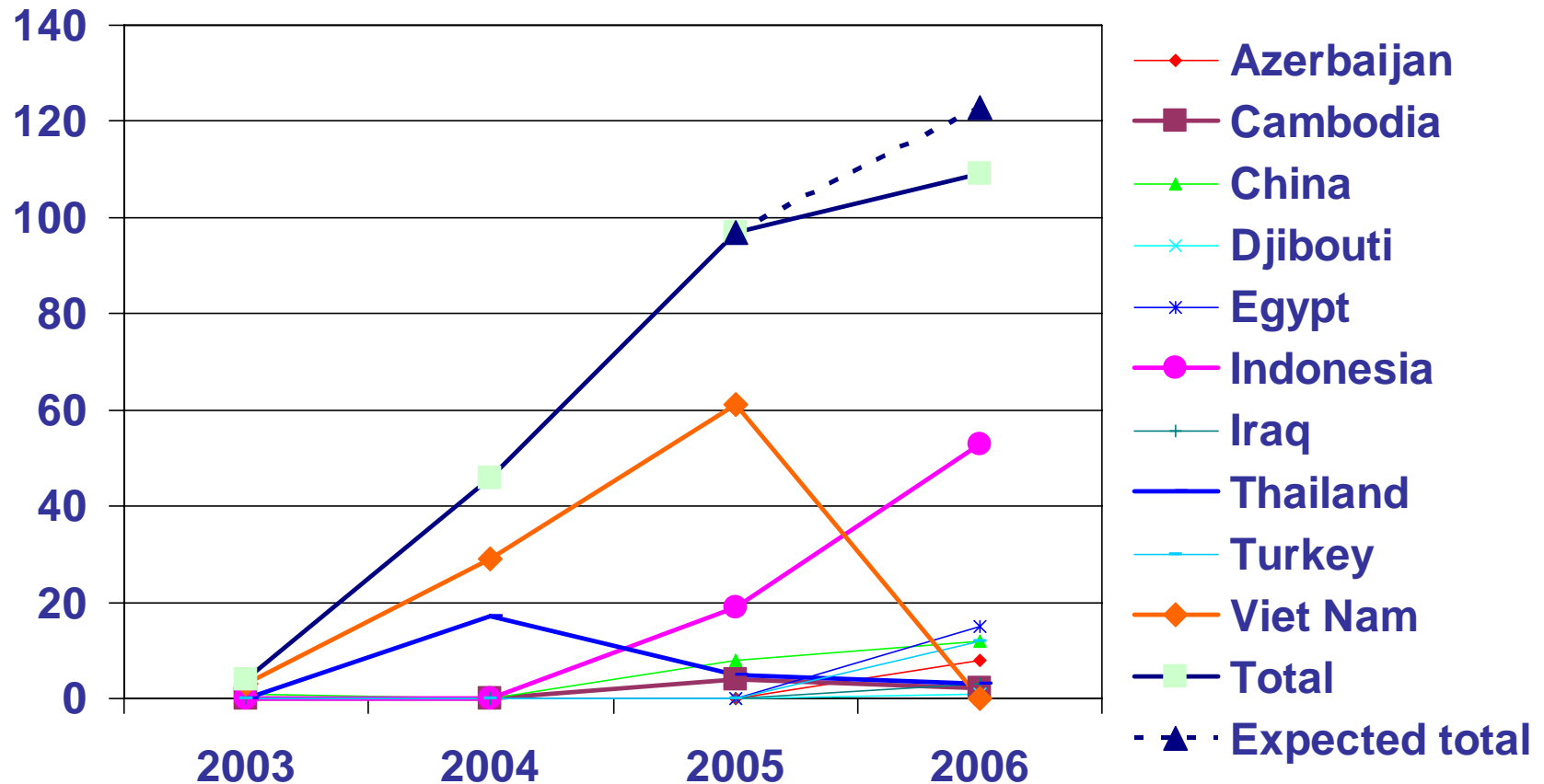
# Sick birds

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- **More sick birds**
- **More dead birds**
- **More countries affected**

**Increased risk of humans coming  
into contact with sick birds**

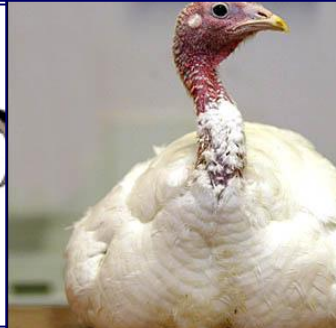
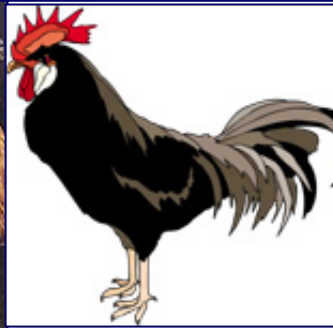
# What is happening now?





# What do you need for pandemic flu?

- A new strain infecting humans ★
- Strain causing pathology ★
- Efficient spread ~~★~~



# Preventing & managing an influenza pandemic

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**>80% of humans infected with avian influenza have been exposed to sick poultry**

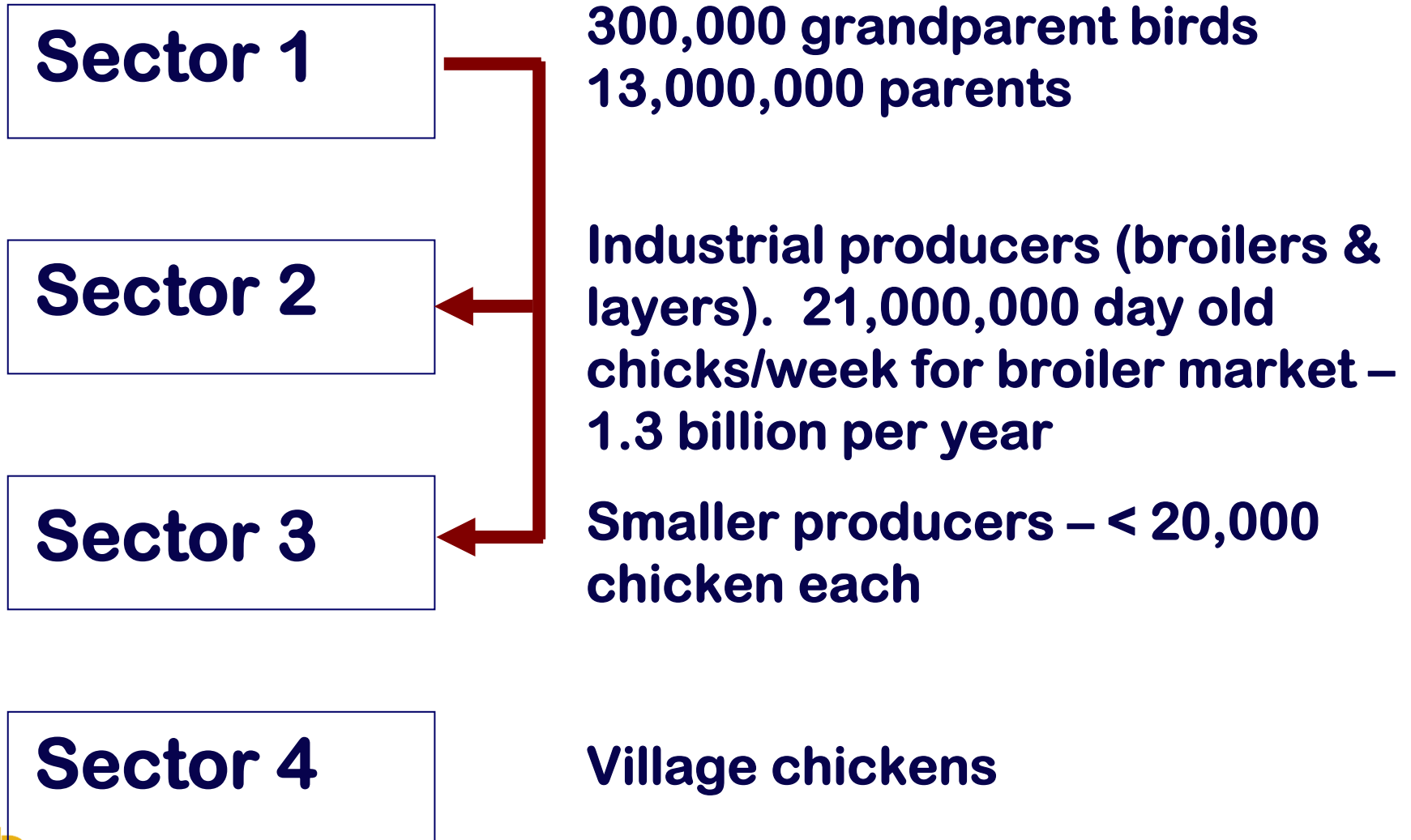
- ❖ **Stop birds being infected with AI**
- ❖ **Decrease human-chicken interaction**
- ❖ **Decrease chance of human seasonal influenza**
- ❖ **Plan for containment (and multiple times)**
- ❖ **Plan for maintenance**

# Stop birds being infected with AI

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- ❖ **Biosecurity - poultry production**
- ❖ **Poultry vaccination**
- ❖ **Controlling markets**
- ❖ **Village chickens**
- ❖ **Compensation**
- ❖ **Capacity to respond to bird outbreaks**

# The poultry sector - Indonesia



# The poultry sector - response

Biosecurity

Vaccination

Sector 1 - stock



Sector 2  
- industrial



+/-

Sector 3 –  
smaller industry

+/-

+/-

Sector 4  
village

?

?

~ 90 %  
sold in  
wet  
markets

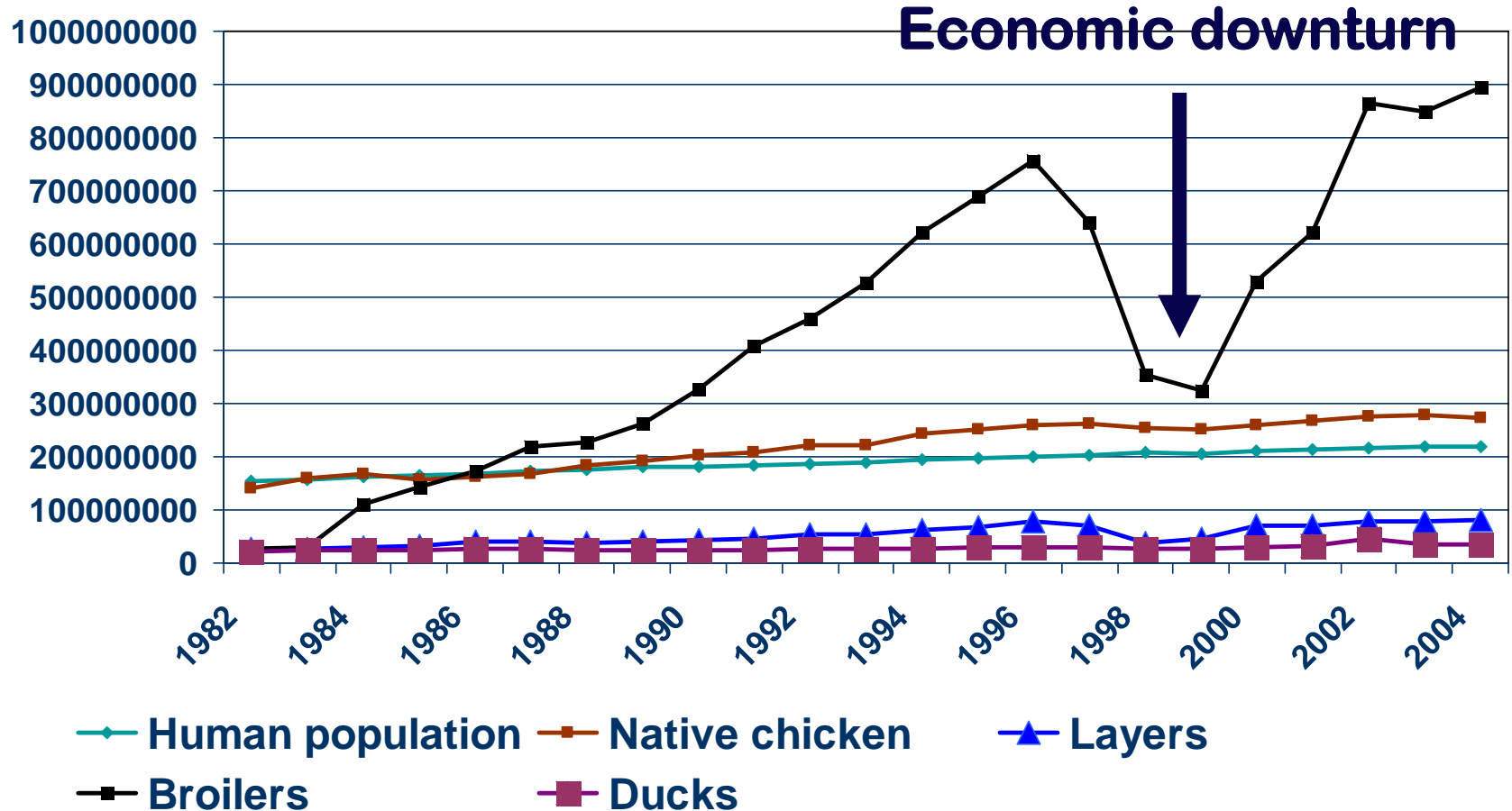
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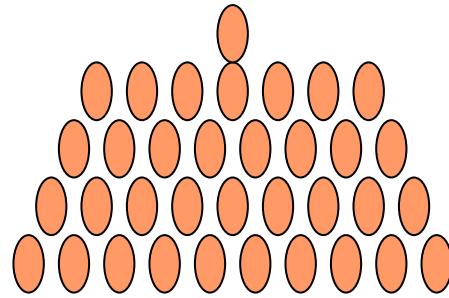
# Decrease human-chicken interaction: the rise and rise of chicken meat (Indonesia, 1982-2004)



# The economy of the chicken in Viet Nam

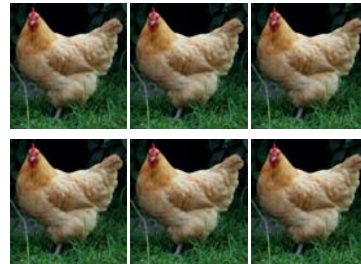


1 hen  
= 40,000 dong  
(USD \$2.50)



35 eggs consumed +  
35 sold by family ~  
49,000 VN Dong or  
USD\$3.06

== 700% annual  
return of capital  
invested for 8  
million families



6 chicken = VN 240,000  
dong or USD \$15

(Courtesy FAO and  
chicken images from  
[www.jameshuggins.com/  
h/hum1/chicken\\_road.htm](http://www.jameshuggins.com/h/hum1/chicken_road.htm))

# Decrease chance of humans having seasonal influenza

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- ❖ **Clinical diagnosis**
- ❖ **Laboratory diagnosis**
- ❖ **Surveillance systems**
- ❖ **Vaccination – vaccine manufacture – skills, capacity, costs**
- ❖ **Anti-virals, other antibiotics**
- ❖ **Infection control**

# Plan for containment (multiple times!)

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- ❖ **Clinical diagnosis**
- ❖ **Laboratory diagnosis**
- ❖ **Surveillance**
- ❖ **Response – teams, drugs, reporting internationally, acceptance of international assistance**
- ❖ **Supplies and logistics**

**etc**



# PPHSN (Pacific Public Health Surveillance Network)



Created in 1996 by WHO & SPC (Sec. of the Pacific Community)



**22 MoH PICTs**

The first priorities of the PPHSN are **communicable diseases**, especially the outbreak-prone ones. At this stage the target diseases include: **dengue, measles, rubella, influenza, leptospirosis, typhoid fever, cholera, SARS and HIV/STIs.**

<http://www.spc.int/phs/PPHSN/index.htm>



# Improving influenza surveillance



- First steps were convening PPHSN workshops
  - Epidemiological and laboratory
- Identified need to improve laboratory diagnostics
  - Only New Caledonia & French Polynesia capable
- Some labs eg Fiji used rapid test kits for influenza
- Funding (US\$250,000) from CDC to enhance influenza surveillance in 2005 (renewed 2006)
  - Set up DIF testing for influenza and RSV
  - Guam, Palau, Fiji, Cook Islands, Tonga initially
  - Other labs in 2006-7
- Seasonal influenza guidelines for PPHSN published
- Pandemic Planning - avian influenza
  - PPHSN Guidelines published, individual countries underway





# PPHSN & Influenza surveillance

## PACIFIC PUBLIC HEALTH SURVEILLANCE NETWORK (PPHSN) INFLUENZA GUIDELINES

PART I: GUIDELINES FOR INFLUENZA PREPAREDNESS & CONTROL

PART II: GUIDELINES FOR INFLUENZA PANDEMIC PREPAREDNESS

PREPARED BY DE 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 PSE/PHLE project)



SPC Secretariat of the Pacific Community



nzaid



**BOSSP**  
Bureau Sentinelle GRIPE  
Fiche de renseignements à joindre aux prélèvements  
pour à transmettre au Département de la Santé

**PARTIE À REMPLIR PAR LE MÉDECIN SENTINELLE :**

**Identification du Prélèvement :**

- Nom : .....
- Téléphone : ..... M# : .....

**Identification du Patient :**

- Nom : ..... Prénom : .....
- Date de Naissance : ..../..../.. Séc :  M
- Adresse complète : .....

**Comores de l'Influenza :**

- Cas isolé  Epidémie familiale  Autre (préciser) : .....
- Non vacciné contre la grippe  Vacciné  Date de la dernière injection : ..../..../..
- Voyage récent à l'étranger : Non  Oui  (Indiquer de retour : .....

**Diagnose :** .....

**PPHSN**  
Influenza Surveillance Network  
Transmission form for Influenza testing  
to be transmitted by the lab to MoH/DHS

**TO BE COMPLETED BY THE CLINICIAN:**

**Person Data:**

- Name: ..... Address: .....
- Tel: ..... email address: .....

**Family ID:**

- Sex Name: ..... First Name: .....
- D.O.B: ..../..../.. (M/F) Sex:  F  M
- Address: .....

**Epidemiological context:**

- Specific case  Familial outbreak  Other (specify): .....
- Not vaccinated against flu  Vaccinated  Date of last vaccine: ..../..../.. (M/F)
- Recent travel: No  Yes  Specify return & where: .....

**Clinical features:**

- First day of illness: ..../..../.. (M/F)
- Symptoms recorded:

Fever <input type="checkbox"/>	High Temp: .....°C	Runny nose <input type="checkbox"/>
Sudden onset <input type="checkbox"/>	Tiredness <input type="checkbox"/>	Muscle pain <input type="checkbox"/>
Cough <input type="checkbox"/>	Headache <input type="checkbox"/>	Sore throat <input type="checkbox"/>

Other symptoms (specify): .....

**Biological samples collected for research:**

- Sample date: ..../..../.. (M/F)
- Nature of sample:
 

Nasal wash (recommended) <input type="checkbox"/>
Pharyngeal swab <input type="checkbox"/>
Nasal aspirate <input type="checkbox"/>
Other (specify): .....

**TO BE COMPLETED BY THE LABORATORY:**

**Lab identification:**

Expt no:  RV\* direct examination  ..... Isolation  .....

(\* RV: direct immunofluorescent antibody test)

NEGATIVE	FLU A	FLU B	Para Inf 3	RSV
Isolated	H3N1	H2N2	Other:	

**Lab verification:** .....

**Public Health Surveillance Network (PPHSN)**  
INFLUENZA GUIDELINES

# Plan for maintenance

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**Even more challenging  
for developing  
countries!**

# What can we expect with PI?

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- ✱ Unpredictable
- ✱ Spread – possibly rapid!
- ✱ Non-traditional risk groups
- ✱ 1<sup>st</sup> wave maybe mild – but not 2<sup>nd</sup>
- ✱ Age groups & areas not affected in W1 likely to be vulnerable in W2
- ✱ Most pandemics arise in Asia – close proximity of humans, pigs, poultry
- ✱ (but may not occur or maybe mild)

Source: WHO, Avian influenza: assessing the pandemic threat

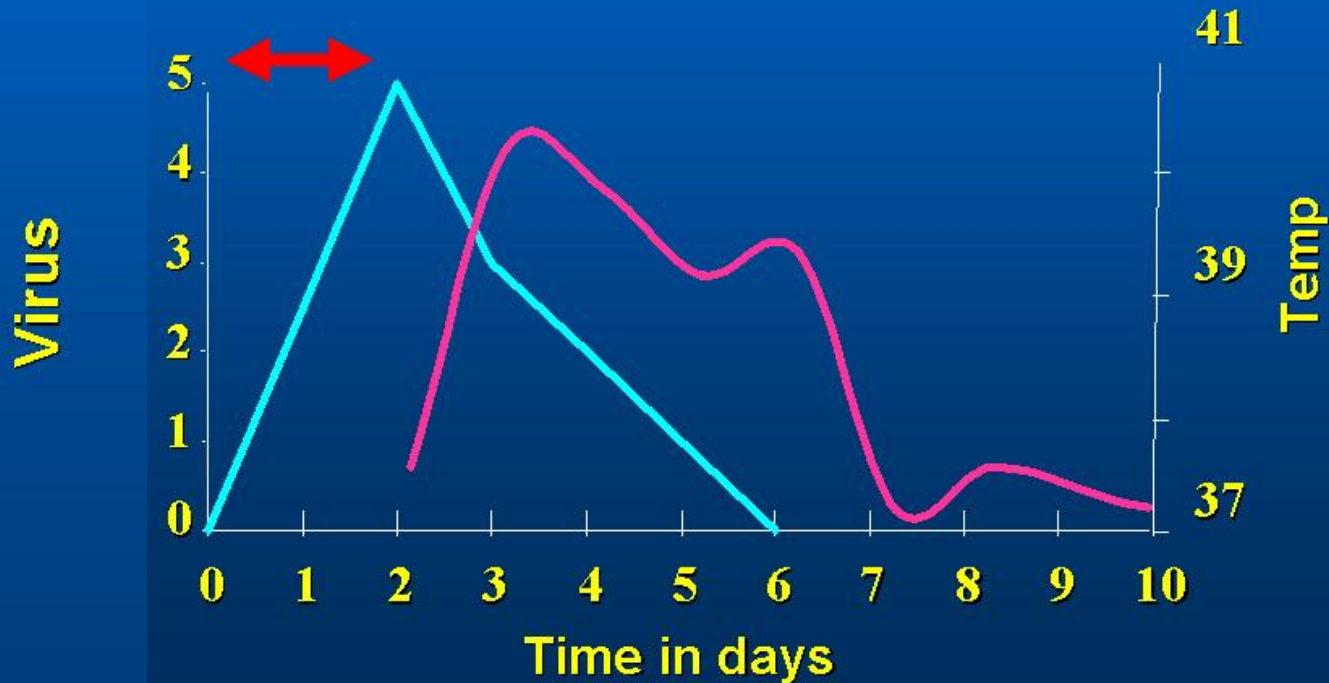
# Influenza virus issues: infectious BEFORE symptoms



## Quarantine Infection and Symptoms



- Virus shedding
- Fever/symptoms



# What have we learned?

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- ★ **Delaying spread (flattening curve) facilitates health service preparedness**
- ★ **Some public health interventions delayed but not prevented international spread – including quarantine**
- ★ **Role of vaccines in pandemic uncertain – production capacity?**
- ★ **Vaccines worth pursuing – severity later waves extends time for vaccine usefulness**

Source: WHO, Avian influenza: assessing the pandemic threat

# The potential impact of a pandemic

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- **Morbidity and mortality**
- **Health care sector challenged**
- **Staff absenteeism (sick, scared, parental responsibilities, grieving)**
- **Social unrest**
- **Schools, workplaces, meetings closed**
- **Economic and societal impact**



# Some issues for maintenance of health services

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- ★ Surge capacity for key functions
- ★ Sufficient staff for routine functions
- ★ Bed capacity for flu and other functions
- ★ Supplies when and where needed
- ★ Food, transport, accommodation for staff (if the situation is really scary)

## IMPORTANCE OF PRE-PLANNING

# One reason for a plan....

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**“If you don't know where you are going, any road will take you there”**

*Lewis Carroll*

*English author & recreational mathematician (1832 - 1898)*

# Preparing for the pandemic

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**Surveillance (clinical, lab, collation,  
interpretation)**

**Response capacity (identify changes, H2H  
transmission)**

**Anti-virals, vaccines**

**Hospital and practice issues (infection control,  
management, surge, dealing with sick staff,  
supplies etc)**

**Education**

**Social issues**

**Non-health sector**

# Big risks of plans

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- **Do too little**
- **Do too much (opportunity cost, crying wolf, too far down track)**
- **Lots of planning but inadequate conversion to action**
- **Too much vertical program development rather than ensuring integrated activity**

# Identifying the past shortfalls of the health system in pandemic planning

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Plandemic, n.

An uncontrolled outbreak of planning triggered by identification of plausible new ways to die.

Main symptoms: desire to hold press-conferences, followed by either mass inoculation or compulsive stockpiling.



*The best way to avoid being embroiled in a plandemic is to stand aside and graciously permit more worried people to do the work.*

# Looking at the gaps

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- **Surveillance**
- **Clinical diagnosis**
- **Investigation**
- **Laboratory diagnosis**
- **Logistics**
- **Planning for response**
- **(drugs and vaccines)**

# Looking at the gaps

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- **Surveillance**
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- **Planning for response**
- **(drugs and vaccines)**

# Looking at the gaps - IC

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- **Insufficient infection control**
- **Inadequate IC governance**
- **Inadequate IC training and skills maintenance, especially at provincial & local level**
- **Inadequate IC equipment & assurance of supplies**
- **Inadequate plans for distribution**



# **Some actions that can be planned**

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**Keeping symptomatic away from asymptomatic**

**Physical barriers between staff/patients/clients**

**Can some staff work from home or at different times of day +  
what do they need for that to work?**

**How many of your staff are parents?**

**Talk to staff about pandemic flu – will they keep working?**

**Can you/staff use PPE? Do you have enough gear?**

**Have you thought about surge capacity?**

**What happens with asthmatics if nebulisers can't  
be used in surgeries?**

# Conclusions (1)

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- **Nurses will always be front-line**
- **In some places nurses are less likely to have access and control over PPE than those who need it least**
- **In some places nurses have insufficient authority**
- **Establishment of proper processes, procedures, protocols and preparedness cannot occur in an outbreak**

# What needs to happen?

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- **Planning**
- **Set milestones**
- **Do the do-able**
- **Recognise if need help**
- **Facilitate response**

**Think about the big picture**

**But remember action is mostly local!**

# **One reason for a plan....**

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**We must become the change  
we want to see in the world.**

**Author: Mahatma Gandhi (1869-1948), India  
nationalist, spiritual leader**

# What can you do?

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- **Participate! Whatever level you are at (national, provincial, district etc)**
- **Planning - understand the process**
- **Partnership – offer your skills**
- **Facilitating response**

**Where will the money come from?**

**And who will decide how it is spent?**

# What is the risk?

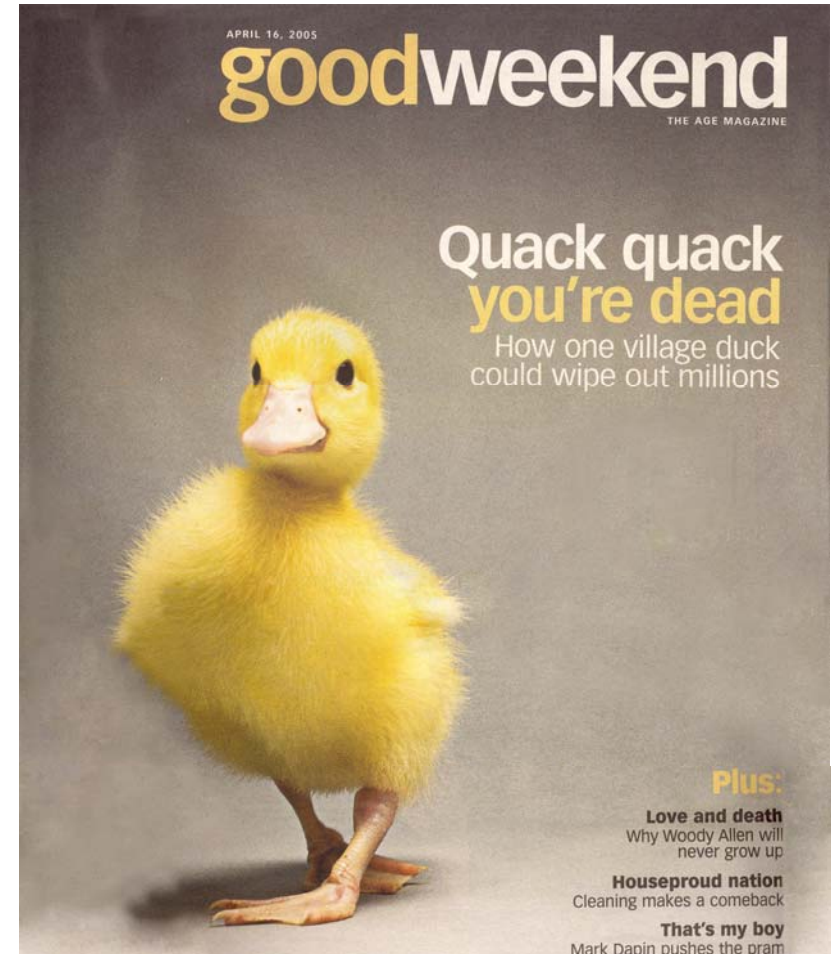
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**Risk is low for any given time...**

**But the consequences are high!**

# Conclusion – pandemic (1)

**Major challenge is to ensure benefits arise from investment in PI that help disease control!**



# Conclusion – pandemic (2)

- Pandemic - not if but when (and no-one knows whether H5N1 is IT!)
- Preparation is the only hope of gaining time
- Preparation is only as good as the weakest link
- The pandemic virus does not yet exist!

