

Practical Pandemic Preparations

Audio presentation of this session at www.pandemic.net.au 31 March 2006

The strategy, alert levels and responsibilities
for health, essential service and critical
infrastructure organisations at different
pandemic alert levels

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PANDEMIC INFLUENZA – THE AUSTRALIAN RESPONSE

**Practical Pandemic Preparations
Canberra March 2006**

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Pandemic Planning

- Why?
- Planning -2005 Major Strategies
- Preparedness
- Reviewing the Strategies and Seeking the Answers

WHY?

Why?

- History
 - Hippocrates 412BC – cough, fever, malaise
 - First pandemic probably early 1580
 - Beveridge* describes 16 epidemics of respiratory illness 1700-1900, 5 pandemic, 3 severe
- Present
 - Huge pool of novel avian influenza virus
 - Human influenza strains derived from avian strains
- Future
 - Improved local/global surveillance and response systems
 - New technologies
 - Global/regional/local collaboration
 - Greater respect for interdependencies

*Beveridge WIB: *Influenza the Last Great Plague*; Heineman Publications
UK 1977

Planning

Whole of Government Approach Interdepartmental Committees

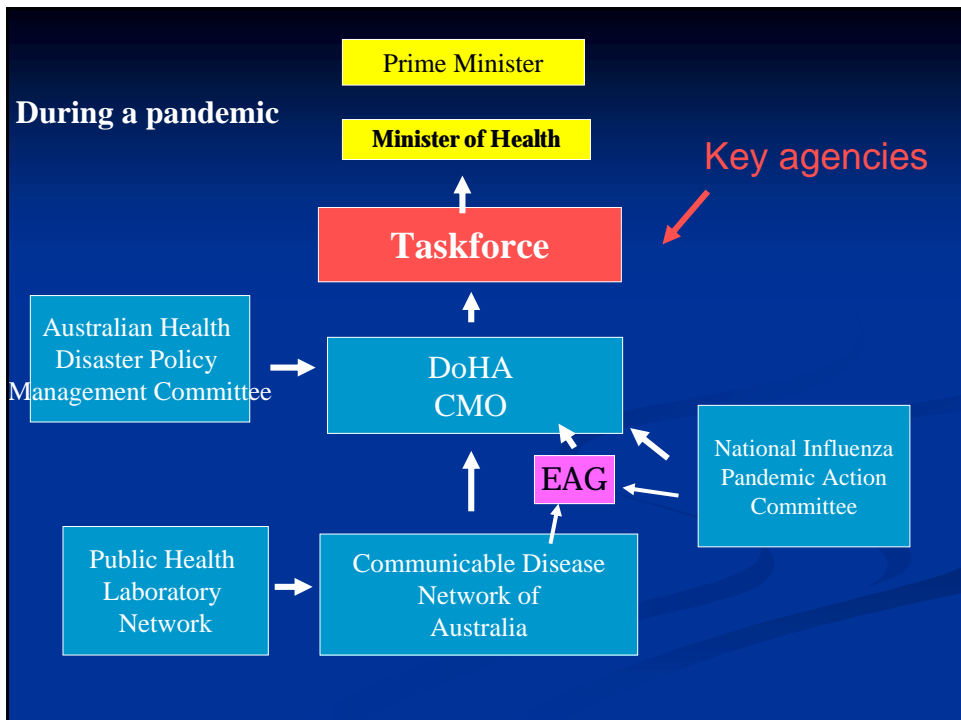
- Health – key strategies
- National Emergency Management Plan
- Prime Minister and Cabinet
 - Food Supply
 - Business Continuity
 - Social Services
 - Transport
 - Economic impact
 - Foreign Policy

Governance

- In an emergency in a State or Territory that State or Territory must ask for help if needed
- A National Emergency can be declared by the Governor General
- In an national emergency a task force would be formed headed by a federal agency – usually Prime Minister and Cabinet

Governance

- In the event of an influenza pandemic a national Emergency would be declared and the Quarantine Act of 1908 invoked
- The Quarantine Act gives sweeping powers to Chief Medical Officer
- 'HPAI Affecting Humans' made a quarantineable disease in March 2004
- Complex relationships within jurisdictional/federal legislation

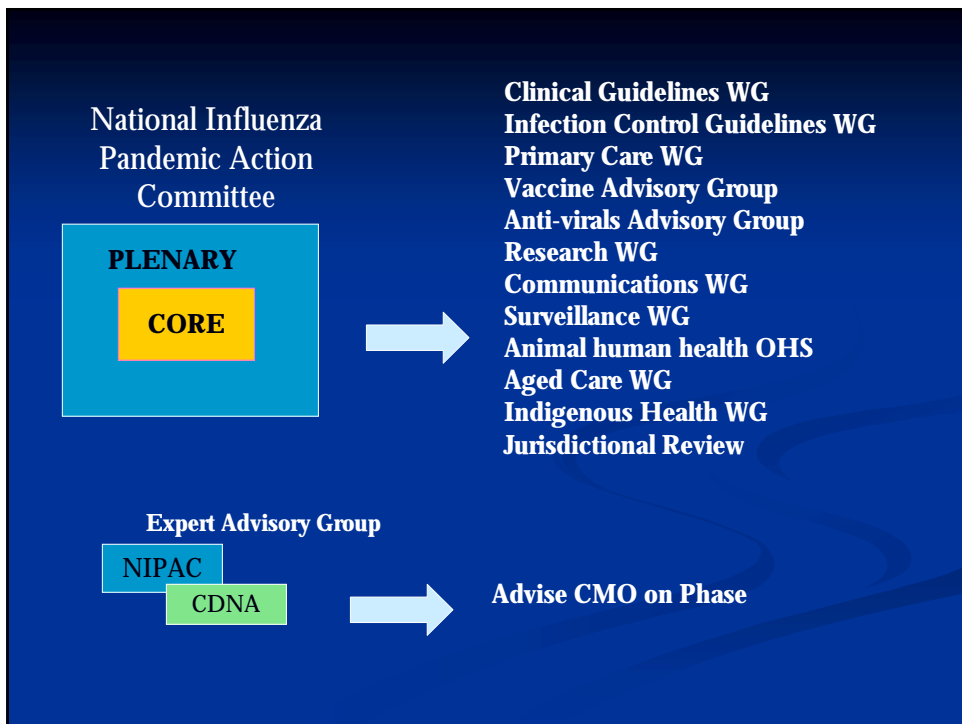


Pandemic Response - Tools

- Public Health Infrastructure
- Civil Order
- Authority (governance – decision processes)
- Quarantine and isolation
- Practice of Infection Control
- Social Distancing
- Pharmaceutical – Antivirals, other
- Vaccines

Planning


- Australian Management Plan for Pandemic Influenza – released June 2005 – outlines major strategies
- AMPPI is currently under revision
 - Overview
 - Annexes
 - Major strategies remain the same – emphasis on containment



Current Plan June 2005

- **Uses all tools**
- **Assumptions – public orderliness**
 - strength of planning
 - S/T will agree
- **Emphasis – structure and decision making process**
- **Nothing set in concrete**
- **Constant review of evidence**
- **Consultation process**

Current pandemic alert level

Period	Phase	Description	Main strategy
Inter-pandemic	0	No animal infection (with subtype that has caused human disease in the past)	
	1	Animal infection: low human risk	
	2	Animal infection: substantial human risk	
Pandemic alert	3	Human infection with novel subtype: no spread or at most rare instances	
	4	Human infection with novel subtype: small clusters, limited human to human transmission	
	5	Human infection with novel subtype: larger clusters, substantial pandemic risk	
Pandemic	6	Pandemic: increased and sustained transmission in the general population	Maintenance of social function

Containment

Keeping it out

- Border control
 - Screening to closure
- Antiviral policy
 - Targeted prophylaxis
- Use of quarantine
 - home quarantine
 - Consideration of mass quarantine in Overseas 5 and 6

Border Control Options

Current

Pratique by exception
Screening baggage for chicken products
Health information sheet

Positive Pratique Screening of select arrivals

Declaration forms,
thermal scanning,
nurse assessment,
isolation and quarantine

Screening all arrivals

Divert flights from specific locations



Containment

Stamping it out

Use of antivirals for prophylaxis

Treatment of index case

Use of home quarantine

Emphasis on early detection (testing)

May use internal border controls

Containment to 'Maintenance of Social Function'

- When to change to 'maintenance of social function'
 - Rate of spread
 - Geographical locations
 - Clinical severity
 - Rate of depletion of stockpile
 - Time to availability of vaccine
 - Depletion of public health resources

Move to maintenance of social function

Keep society functioning

Continuous antivirals

- for health care workers
- those at high risk of exposure

Post exposure prophylaxis for key workers

- for those at less risk of exposure

Treatment if symptomatic

- depends on effectiveness of antivirals

Quarantine

- Still advised, monitoring to cease
- Ban on mass gatherings advised to continue

Preparedness

Since 2003

- Upgrading of surveillance ability
- Upgrading of laboratory capacity
- Purchase of antivirals
- Funding to stockpile vaccine
- Other stockpile components
- Review of National Legislation
- Exercises
- Establishment of Office of Health Protection
- Development of communication packages
- Urgent research process

Surveillance

- Development of on-line systems
 - Secure
 - Real time outbreak management system
- Increasing hospital surveillance
 - Syndromic surveillance
- Increasing community surveillance
 - ASPREN
- Airport screening
 - Thermal scanners

Upgrading Laboratory Capacity

- New independent WHO Influenza Collaborating Centre \$23M
- Public Health Laboratory Network \$6M
 - Increasing biosecurity
 - Upgrading designated facilities
 - Stockpiling reagents

National Medicines Stockpile

- Oseltamivir (Tamiflu) and zanamivir (Relenza)
 - Approximately 8 million courses by 2007 (\$195M)
- Antibiotics
- Personal Protective Equipment
- Vaccination Packs
- Quarantine Packs
- Ventilators
- Portable Negative Pressure Units

Vaccine Capacity

- Contracts with vaccine companies for pandemic vaccine supply
- Support for accelerated clinical trials by CSL Ltd
- Funding for stockpiling H5N1 vaccine, vaccine components

Communications

- Community and professional education
- Targeted messages for each phase of the pandemic
- Operational communication
- Research

Region

- 2004 – project to increase surveillance capacity particularly in agriculture through AusAID
- Discussion with countries to provide epidemiologists and planners
- Overall \$141m to region
- Will provide assistance on request

Urgent Research

- Symposium in April 2005
 - Confirmed capacity
 - Determined priorities
- \$6.57 million awarded
 - Detection and monitoring (8)
 - Public Health Intervention (5)
 - Antivirals (incl resistance) (3)
 - Pandemic vaccine (9)
 - Behavioural response (4)
 - Other (4)

Reviewing the Strategies & Seeking the answers

Key Aspects

- Examining past pandemics
- Targeted research
- Modeling - extrapolating into current context

Specific Tools

- Infection Control
- Quarantine
- Social Distancing
- Antiviral medication
- Vaccination
- Influencing people's behaviour

Infection Control

- If applied rigorously can have major impact
 - SARS
 - Modeling
- Hand hygiene
- Cough Etiquette
- Use of disinfectants

How long does the virus survive on hands and surfaces?

Relative importance of aerosol versus fomite transmission?

Are surgical masks effective? If so for how long?

Is a poorly fitted P2 mask worse than no mask?

Social Distancing

- No shaking hands, hugging or kissing
- Keep where possible one metre away from another person
- Practice within the home as well as within the community

Is school closure helpful?

Should workplaces close or keep them open and use where possible good infection control and social distancing?

Quarantine

- Home quarantine will be used
- 2-3 days (incubation period) for people arriving from affected countries
 - Household members only in quarantine if person develops symptoms
- Household with infected person 7 days, more if index case a child
- Mass quarantine only in case of high transmission OS, no cases in Australia – Whole of Gov decision

Will people comply?

Anti-virals

- Reduce duration of illness in seasonal influenza if given within 48 hours of onset of symptoms
- 80-90% effective in preventing illness
- 5-10% of people on pre-exposure prophylaxis develop antibodies
- 10-40% of people on post-exposure prophylaxis develop antibodies
- Unknown effectiveness against a pandemic virus

Does the presence of antibodies indicate adequate immunity?

The ten percent trial

- 400,000 + treatment courses
- **How do you do a clinical trial on the run?**
 - Compare with known morbidity/mortality/ path parameters of untreated cases
 - Temporal re onset symptoms commencement of treatment
 - International collaboration would be good

NHMRC project to set up trial parameters and infrastructure

Vaccine Challenges

Time, safety, effectiveness, dose required, adjuvant
Who to target first?



Vaccine Issues

- NIBSC Vietnam 2003 – grows slowly 30% yield
- Sanofi Pasteur – adjuvanted vaccine at 30 ug 2 dose produces ‘adequate’ immune response
- CSL Ltd similar results
- Implications: Increased cost, increased time to production
- Main thrust international research – different adjuvants

Vaccine Issues

- Expert opinion that vaccine derived from the current H5N1 strain will provide at least partial protection
- Many Western Governments moving to stockpile H5N1 vaccine, vaccine ‘prototypes’ or bulk antigen
- Government has committed \$16.6m to stockpile
- Products under consideration by working group of NIPAC

Influencing Peoples Behaviour

- Research
 - Commissioned research – Blue Moon
 - NHMRC projects
- Education
- Health promotion
- Incentives
 - Family well being
 - Community rewards
- Targeted messages
- Enforcement

Modelling

- Papers by Ferguson et al, Longini et al indicate a pandemic may be stopped by use of antivirals and quarantine
- Modeling currently being carried out in Australia indicates home quarantine, infection control and social distancing can have a major effect in ‘blunting’ epidemiological curve

Eradication and Containment

- Early detection and rapid response
- Need to know transmission characteristics of the virus, effectiveness of antivirals and effectiveness of other public health interventions as early as possible
- Easiest to do by examining transmission in households

Set up infrastructure and parameters for this now?

Messages in the preliminary modeling

- Infection control, quarantine, social distancing are effective in slowing transmission
- Effectiveness is markedly increased in combination
- Best use of anti-virals is targeted prophylaxis
- Border control only useful if highly rigorous
- Pandemic influenza possibly can be contained for many months
- Early rapid response can potentially eradicate a pandemic virus
- All the above subject to assumptions!

Be calm and contained?



More information
on the Department
of Health and
Ageing's influenza
pandemic
preparedness can be
found at
www.health.gov.au

THANK YOU

Transmission rate of influenza R_0

- Estimated to be between 1.5 and 3.5
- Estimated using values from the 3 pandemic of last century and seasonal influenza
- This is lower than other infectious diseases
 - Partial immunity to the virus
 - May be higher in certain populations
- But attack rate is high 30-40%
 - Short incubation period

R_0 between 1.5 – 3.5 indicate the disease is potentially eradicable

Monthly mortality rate in New York City (/10,000 population)

Source: Adapted from DR Olson et al, PNAS, Aug 2,2005, vol 102, no 31, 11059-11063

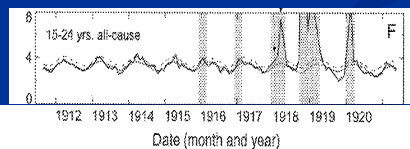


Fig. 1. All-cause and P&I monthly mortality rates for all ages (A and B) and all-cause mortality rates by age group (C-H) are calculated per 10,000 population. Observed rates are days-per-month adjusted. Expected model baselines (solid lines) are derived from each series of nonepidemic months. Epidemic thresholds (dashed lines) are the upper 95% confidence limit above each baseline. The major epidemic influenza season months are indicated (shaded). Two 1917/1918 influenza season peaks (arrowheads) show excess mortality primarily confined to the ≥ 65 -years age group in January (G), and to the groups < 45 years old in March 1918 (E-H). Other severe mortality events are evident: summer diarrheal disease epidemics were confined to young children (H), the 1916 polio epidemic to all children (G and H), and the summer 1917 heat wave and diarrheal disease epidemic among the youngest and oldest age groups (C and H).