The Australian response: pandemic influenza preparedness

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ABSTRACT

- Australia's preparedness for a potential influenza pandemic involves many players, from individual health carers to interdepartmental government committees. It embraces a wide number of strategies from the management of the disease to facilitating business continuity.
- The key strategy underlying Australia's planned response is an intensive effort to reduce transmission of the virus. This includes actions to reduce the likelihood of entry of the virus into the country and to contain outbreaks when they occur. Containment will provide time to allow production of a matched vaccine.
- The health strategies are outlined in the *Australian health management plan for pandemic influenza*. The plan is accompanied by technical annexes setting out key considerations and guidelines in the areas of clinical management and infection control.
- National plans present overall strategies and guidance, but the operational details can only be determined by individual states and territories, regions, and the services themselves.
- Primary health care practices will be on the frontline of an influenza pandemic. Every practice needs a plan that defines the roles of staff, incorporates infection control and staff protection measures, and considers business continuity. Most importantly, a practice needs to know how to implement that plan.

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In Australia, the peak of the "Spanish flu" pandemic occurred in mid June 1919. In that week, 1315 people were being treated for influenza in hospitals in New South Wales. Of those, fewer than 900 survived. By November that year, the pandemic for Australia was essentially over, but nationwide it had taken more than 10 000 lives.[1]

Two other influenza pandemics reached Australia's shores, one in 1957 and one in 1968. These were less severe and affected primarily the vulnerable: the young, the elderly, pregnant women, and people with chronic diseases.

In 1997, in Hong Kong, a disease with high mortality swept through poultry; 18 people came down with a severe respiratory illness and six died. An identical strain of influenza A virus, H5N1, was detected in the chickens and in the infected humans. Hong Kong authorities reacted with widespread culling of all chickens. It seemed the virus had been beaten.

In 2003, the virus re-emerged in Thailand and Vietnam, spreading rapidly through poultry flocks. Human cases occurred, but in all but one case there was clear contact with poultry. Intensive efforts at culling poultry in affected areas seemed to halt the spread. However, in May 2005, the virus was discovered in many bird species in the Qinghai province of western China. From there, it has spread across Europe and down into the Middle East and Africa. More than 150 million birds have been destroyed and more than 200 people infected. The mortality rate of what is termed "avian influenza" or "bird flu" in humans is greater than 50%.[2,3]

Indonesia is currently the country most affected by bird flu. Outbreaks in poultry have occurred in most provinces. Sporadic human cases continue to occur. A cluster of seven cases in one family in a village in Sumatra gave rise to worldwide concern. It was considered likely that human-to-human transmission had occurred.[2]

Influenza A/H5N1 has three of the four elements to cause a pandemic. It is novel (there is little immunity in the population), it can infect humans, and it causes severe disease. It has not yet gained the fourth and essential characteristic to cause a human pandemic — the ability to efficiently transmit from human to human.

Even if H5N1 never gains the ability to cause a pandemic, it is likely that new respiratory influenza and non-influenza viruses will continue to emerge. The severe acute respiratory syndrome virus, from the corona virus family, was one such emergent virus that caught the world by surprise.

The Australian response

The Australian Government has reacted quickly to the pandemic threat caused by the H5N1 virus. Since 2003, it has committed more than $600 million to pandemic preparedness. This includes $156 million to the Asia-Pacific region to develop capacity for response.

In Australia, a "whole of government" approach has been adopted. This recognises that health protection decisions that may be taken in response to a pandemic, particularly in regard to border control, quarantine and school closures, will affect society beyond direct health. The response to a pandemic needs to consider areas as diverse as food supply, energy supply, and overall business continuity. In short, pandemic planning is a continual and extensive process. Plans need to be updated and fine-tuned as new evidence becomes available.

The Australian health response plan is detailed in the *Australian health management plan for pandemic influenza* (AHMPPI). This document is aimed at the general public. It is accompanied by several technical annexes: the *Interim infection control guidelines for pandemic influenza in healthcare and community settings* and the *Interim national pandemic influenza clinical guidelines* have been published; the *Guidelines for management of pandemic influenza in primary care settings* are close to finalisation.

A key part of pandemic preparation and response is communication. This involves education, operational communication, and management of data and information. The Department of Health and Ageing has published a *Communications strategy overview*, which details important considerations and actions for each phase of an influenza pandemic.

The AHMPPI, the annexes, the communications strategy and additional information are available on the Department of Health and Ageing website <http://www.health.gov.au>.

The health response

The strategy for response in Australia is based on containment. This means that all effort will be made to delay the entry of the pandemic virus strain into Australia and to contain any outbreaks

1 Pandemic phases

Period	Global phase	Australian phase	Description of phase
Inter-pandemic		Aus 0	No circulating animal influenza subtypes in Australia that have caused human disease
	1	Overseas 1	Animal infection overseas: the risk of human infection or disease is considered low
		Aus 1	Animal infection in Australia: the risk of human infection or disease is considered low
Pandemic alert	2	Overseas 2	Animal infection overseas: substantial risk of human disease
		Aus 2	Animal infection in Australia: substantial risk of human disease
	3	Overseas 3	Human infection overseas with new subtype(s) but no human-to-human spread or at most rare instances of spread to a close contact
		Aus 3	Human infection in Australia with new subtype(s) but no human-to-human spread or at most rare instances of spread to a close contact
	4	Overseas 4	Human infection overseas: small cluster(s) consistent with limited human-to-human transmission, spread highly localised, suggesting the virus is not well adapted to humans
		Aus 4	Human infection in Australia: small cluster(s) consistent with limited human-to-human transmission, spread highly localised, suggesting the virus is not well adapted to humans
	5	Overseas 5	Human infection overseas: larger cluster(s) but human-to-human transmission still localised, suggesting the virus is becoming increasingly better adapted to humans, but may not yet be fully adapted (substantial pandemic risk)
		Aus 5	Human infection in Australia: larger cluster(s) but human-to-human transmission still localised, suggesting the virus is becoming increasingly better adapted to humans, but may not yet be fully adapted (substantial pandemic risk)
Pandemic	6	Overseas 6	Pandemic overseas — not in Australia; increased and sustained transmission in general population
		Aus 6a	Pandemic in Australia: localised (one area of country)
		Aus 6b	Pandemic in Australia: widespread
		Aus 6c	Pandemic in Australia: subsided
		Aus 6d	Pandemic in Australia: next wave

Reproduced from the *Australian health management plan for pandemic influenza*.◆

that do occur. This will allow time to produce a matched vaccine. If the pandemic cannot be contained, the strategy will shift to support maintenance of social functioning.

The actions at each phase of the pandemic (Box 1) are outlined in the AHMPPI. The current global designation of phase by the World Health Organization is alert level 3 (Overseas 3). Australia is technically in Phase 0.

National Medical Stockpile

Since 2003, the Australian Government has developed a stockpile with a high per capita quotient of antivirals, antibiotics, personal protective equipment (PPE) for infection control, quarantine supplies, and additional ventilators for patients requiring intensive care.

In the event of a pandemic, the Chief Health Officers of the affected states or territories will request supplies through the Chief Medical Officer of the Commonwealth Government.

The antiviral stockpile, almost entirely the neuraminidase inhibitors oral oseltamivir and inhalant zanamivir, will contain 8.75 million courses by early 2007. Seasonal studies have shown that these antivirals reduce the duration and severity of disease if given early, and are effective at preventing infection.[4,5]

The government has agreements to enable the secure supply of antivirals and PPE from the National Medical Stockpile to public health authorities in each state and territory. Public health units will then arrange for distribution at the local level in accordance with nationally agreed policy. Arrangements may vary. It is important that individual primary care settings know the state/territory and local area plans.

A study will commence immediately when a pandemic develops in Australia, to assess the effectiveness of antivirals in treatment and prevention.

Early detection

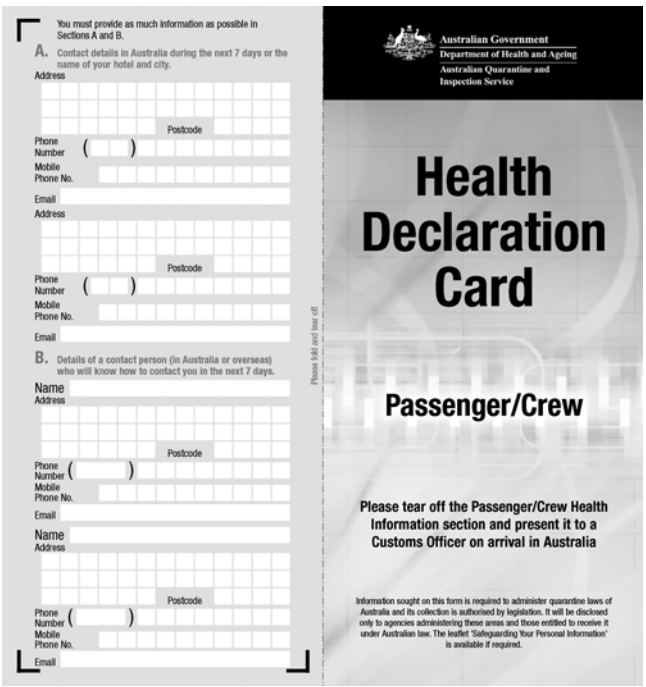
Sentinel systems have been set up in a number of general practices and hospital emergency departments to detect clusters of influenza-like illness. In the event of an acceleration of cases overseas, all general practices and emergency departments at hospitals throughout Australia will be on high alert. An online outbreak management system, "Net Epi", has been developed to manage information and data flow. This system will enable public health authorities to easily input data collected from general practices, emergency departments, and fever clinics. This will provide a real-time national picture of the number of cases and the spread of the disease.

General practices will play a crucial part in providing information to public health authorities. Further work on how to facilitate collection of data at the primary care front is underway.

Keeping it out

Border control is operating at the moment in Australia for avian influenza. Many tons of bird products such as feathers and eggs have been confiscated by the Australian Quarantine and Inspection Service. In the event of an escalation of human cases overseas, a move toward tighter management of passengers arriving in Australia will be considered. This will involve measures such as "positive pratique" for incoming international flights. Under posi-

2 Health declaration card



tive pratique, the pilot of an aircraft is required to report on the condition of passengers and crew before landing.

Other measures include using thermal scanners to screen for fever, clinical assessment of symptomatic passengers by nurses stationed at the border, and short-term quarantine of arriving passengers potentially exposed to the virus. All passengers will be required to fill out "health declaration cards", which will detail symptoms and request personal and contact details (Box 2). This will facilitate timely contact tracing.

Containing spread

Once cases or clusters begin occurring in Australia, antivirals from the National Medical Stockpile will be provided to people with suspected pandemic influenza. The treatment will be ceased if tests are negative. Antivirals will be provided to close contacts of people with proven pandemic influenza to prevent the infection spreading. Contacts will also be required to remain in quarantine at home for up to 1 week.

Health care workers

Continuous antiviral prophylaxis will be provided to health care workers who are dealing on a day-to-day basis with influenza patients. Health care workers caring for influenza patients are at high risk both of acquiring the disease and of spreading the disease. Other health care workers will be provided with antivirals on a post-exposure basis.

Public health interventions

A person with influenza infects one to two other people. This is far less than the infectivity of, for example, polio or measles, in which one person may infect on average five and 10 others, respectively.[6] The spread of influenza is largely due to its very short incubation period. This means if an infected person can be identified early and quarantined then the chance of that person causing an epidemic is greatly reduced.

The Australian Government has commissioned experts in Australia to model the effect of public health interventions on the spread of a pandemic. The results indicate that the use of quarantine, social distancing, and personal hygiene could have a significant effect in slowing and reducing the impact of a pandemic.[7] The addition of antivirals greatly assists in the "ring fencing" of an outbreak. The results of this modelling have been echoed by international studies.[8-11]

Social distancing refers to all non-pharmaceutical methods of infection control. It includes reducing contacts in the community by not holding mass gatherings and by encouraging individuals to keep distance from others in communal settings. It also includes personal hygiene such as frequent hand washing, cough and sneeze etiquette, and reduction in close human contact (no kissing, no hugging). Social distancing is an extremely effective tool, particularly when applied both in the community and in the home.[7,8]

The combined effect of quarantine, social distancing, and targeted use of antivirals may allow a pandemic to be controlled or prevented from taking off in Australia for more than a year.[7-11]

Fever clinics

Some states or territories will elect in their plans to put an emphasis on the use of fever clinics. People who have a fever will be asked to attend such clinics instead of attending a general practice. The use of fever clinics is designed to take the pressure away from general practice and emergency departments. Fever clinics may be set up in town halls or community health centres, or governments may elect to construct temporary premises for the purpose. These facilities will require a surge workforce and the primary care workforce will be asked to assist.

Primary health care settings

In some states or territories, general practices may have to designate themselves as "influenza" or "non-influenza". All practices need to consider how they will manage patients with fever or respiratory symptoms. It is essential to know the role of a primary practice in a particular community setting, how to report cases, institute rigorous infection control and monitor staff, and the procedure for requesting antivirals and PPE. Families of health care workers should not be exposed to extra risk. Systems, particularly in infection control, need to be in place to reassure families that risk is minimal and that antivirals will be supplied in the event of infection within the family.

Rural and remote general practices, often sole practitioners within a community, will be under considerable pressure. Such practices are critical points in a community for health and for overall social wellbeing.

Consideration of the many different situations of general practice is being set out, following consultation with the primary care sector, in the *Guidelines for management of pandemic influenza in primary care settings.*

Vaccines

Contracts for the supply of vaccine in the event of a pandemic have been signed by the Australian Government with two companies:

CSL Ltd, an Australian manufacturer, and Sanofi Pasteur, based in France. The Department of Health and Ageing is closely monitoring developments in pandemic vaccine technology globally, and is in continual contact with a range of manufacturers.

Decisions on priority for access to the vaccine will need to be taken in light of the stage of the pandemic, pattern of morbidity and mortality, and timing to availability of vaccine. At this stage, the Department of Health and Ageing is recommending that the vaccine be deployed in support of the containment strategy. This would mean that health care workers at continuous high risk of exposure to the virus would receive priority access.

Government advice and decision-making processes

In the event of a pandemic, the Chief Medical Officer and the Australian Health Protection Committee will have critical roles in advising governments. The Australian Health Protection Committee is chaired by a senior Australian Government health official and comprises the Chief Medical Officer, the Chief Health Officers of each state and territory, and a number of disaster and emergency response experts. It can be called together within hours. The National Influenza Pandemic Action Committee (NIPAC) comprises scientific experts in the influenza field. NIPAC provides ongoing advice to the Chief Medical Officer on key health responses requiring expert technical guidance. These two key committees will determine Australia's health response to a pandemic influenza event.

The emergence of effective human-to-human transmission of a pandemic strain virus will trigger immediate action across a broad cross-section of all governments. In addition to the Australian Health Protection Committee, the Commonwealth Government will immediately convene a taskforce of federal government agencies. Similar whole-of-government arrangements will be in place in states and territories.

The authority and decision-making arrangements are set out in the *National action plan for human influenza pandemic*, which can be found at <http://www.pmc.gov.au>.

Exercises

In October 2006, Exercise Cumpston 06 tested national arrangements for responding to a simulated human influenza pandemic. Operational responses were exercised in Queensland, with the simulated arrival of infected people at Brisbane airport and the simulation of a small number of infections developing in a community in south-east Queensland. All Australian governments were involved in the 4-day exercise through decision making in response to the outbreak. Once debriefing sessions are completed, an evaluation report will be finalised.

The future

The world has changed since previous pandemics. Faster, cheaper international travel and more densely populated countries potentially make it easier for disease to spread. Economies are more interdependent, and many businesses, including medical practices, operate on a "just in time" basis for the delivery of essential supplies, often from overseas.

Nonetheless, governments and communities are better prepared than ever to respond effectively to a pandemic. Awareness of the need for continuity planning among businesses is high.

It may be that the world has already averted a pandemic by the actions it has taken in response to H5N1, such as extensive culling of poultry and isolation of infected humans. Yet all preparations may seem insufficient if the world comes face to face with a rapidly spreading novel virus like the one that emerged in 1918. Rapid detection of human-to-human transmission, early and intensive implementation of containment measures, and the development and deployment of effective vaccine are our best strategies for responding.

Competing interests

None identified.

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