AUDITOR-GENERAL'S REPORT

PERFORMANCE AUDIT

Major Infectious Disease Outbreaks: Readiness to Respond

NSW Health

The Legislative Assembly
Parliament House
SYDNEY NSW 2000

The Legislative Council
Parliament House
SYDNEY NSW 2000

In accordance with section 38E of the *Public Finance and Audit Act 1983*, I present a report titled **Major Infectious Disease Outbreaks: Readiness to Respond.**

Peter Achterstraat
Auditor-General

Sydney
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Foreword

In modern times, increased world travel has provided many opportunities for diseases such as HIV, influenza and SARS to spread quickly from country to country.

A major outbreak of a new infectious disease can lead to epidemics or pandemics that place intense demands on health systems.

This audit examines whether the NSW public health system is ready to respond to a public health emergency from a major infectious disease outbreak. It focuses on the critical role of NSW Health.

The report builds on our audit work over the last few years in the NSW public health sector. I believe it will inform planning for major infectious disease outbreaks and add to transparency in an area of increased public concern.

Peter Achterstraat
Auditor-General

November 2006

Executive summary

The focus of our audit

The existence of new and re-emerging disease threats such as severe acute respiratory syndrome (SARS) and the ongoing outbreak of avian influenza have prompted countries around the world to examine closely their capacity to prevent, detect and respond to serious infectious diseases.

There is a small but realistic chance that sometime in the next year or two we could have an epidemic or a pandemic. The impact on New South Wales could be severe, causing more than 12,500 deaths over a two-month period and a 6.6 per cent reduction in the State's gross domestic product - equivalent to around $20 billion.

This audit focuses on the critical role of NSW Health. We wanted to know if the NSW public health system is ready to respond to a public health emergency arising from a major infectious disease outbreak. These diseases include severe acute respiratory syndrome (SARS), smallpox, tuberculosis, new forms of influenza and other newly emerging diseases.

The key questions we wanted to answer were:
- is the public health system well organised to respond to an emergency
- is the public health system preparing to respond to a full range of emergencies
- is there likely to be sufficient and timely advice to all in cases of major infectious disease outbreaks
- is there likely to be sufficient capacity in the health system?

Further information on the audit approach and scope can be found in Appendix 1.

Audit opinion

NSW Health is working to increase its preparedness to respond to a major infectious disease outbreak. It is also contributing to the development of national policies, strategies and capabilities, which affect its level of preparedness.

NSW Health has focused on contingency plans to respond to an influenza pandemic and has accomplished much. The plans need to be further developed and tested. There is to be close integration with private health providers. Capacity limits are being analysed and options for surge capacity developed.

NSW Health indicated to us that their progress has been dependent upon the need to develop a better understanding of what is required, the need to ensure national consistency in approach, and the need to adequately involve and integrate the Area Health Services in developing the response.

NSW Health also has plans for the management of some other types of infectious disease outbreaks, such as smallpox, which could be modified to suit types of disease outbreaks that are not documented. Additionally, the work on the influenza pandemic could be used to develop broader contingency plans for other types of major infectious disease outbreaks.

We found little evidence that other jurisdictions were significantly further advanced than NSW in preparation and testing of plans for a pandemic. This is a major task. It also needs to be addressed in the face of competing priorities that are much closer to hand. But there is much to do and there may only be a limited time in which to complete preparations.

In our view NSW Health needs to balance the costs of over-preparedness and additional capacity that may never be used, against the very significant consequences of under-preparation. It needs to identify the desired level of preparedness for its Area Health Services, set measurable goals and identify key gaps between those goals and current capabilities. It needs to set clear plans for closing those gaps and then sustaining desired levels of preparedness.

Recommendations

We recommend that NSW Health continue with its good work and:

Strengthen organisational arrangements

- conclude agreements with private health providers specifying roles, and expectations in the case of an infectious disease pandemic (page 17)

- establish a time table to finalise all emergency and contingency plans (page 22)

- consider building on influenza pandemic preparedness planning to develop broader contingency plans to address the emergence of other new, highly transmissible and/or severe infectious diseases (page 22)

- apply the lessons learnt from *Exercise Cumpston* to further improve preparedness for major infectious disease emergencies (page 25)

- formally establish and oversight a comprehensive program of training, testing and evaluation of plans at the state, area and facility level (page 25)

- establish a performance management framework with targets and indicators to assess progress in preparing for infectious disease emergencies (page 25).

Develop systematic risk assessment processes

- consider a more structured and systematic approach to the planning and risk assessment of major infectious diseases to assist transparency and decision making (page 31).

Assess and address the need for improved information systems	▪ continue to develop and test its surveillance systems for early detection of infectious diseases (page 38)
	▪ continue to develop and test the capability of its contact tracing system to deal with a public health emergency (page 38)
	▪ continue to improve communication mechanisms with those, such as GPs, likely to be affected in major infectious disease outbreaks (page 41)
	▪ continue to develop systems to bring all the information relevant to the surge in demand for health resources together in real time (page 41).
Assess and address the need for surge capacity	▪ continue to develop plans to respond to the surge in demand for diagnostic tests and for laboratory personnel (page 47)
	▪ develop distinct surge capacity plans within each Area Health Service to manage emergency staffing needs, isolation facilities, intensive care units, assisted ventilation services, hospital beds and medical supplies (page 52).

Key audit findings

**Chapter 1
Is the public health system well organised to respond to an emergency?**

The public health system is well organised to respond to an emergency incident. It is increasingly better organised to respond to an infectious disease epidemic or pandemic, but there is more to be done.

Public health system roles and responsibilities in responding to an emergency incident have been clearly designated. But further work is required to define the roles and responsibilities of outside bodies, whose roles are likely to be critical in a pandemic.

A clearly defined command and control structure is in place for health emergencies. Area Health Services have initial responsibility for case management and containment. A whole-of-health, and possibly whole-of-state, approach would be used if the situation escalates.

The completeness and quality of plans is an important indicator of preparedness. NSW Health has a high level emergency plan known as 'HEALTHPLAN', but most of the specific plans that support it are incomplete and in draft form and not available for use. There is a NSW whole-of-government plan and a NSW Health plan for an influenza pandemic. But most of the plans that support this are incomplete and in draft form. The need for some of these plans is being reviewed. NSW Health also has plans for the management of some other types of infectious disease outbreaks, such as smallpox, which could be modified to suit types of disease outbreaks that are not documented.

Until recently there was relatively little formal testing of plans, although experience was gained with the outbreaks that do occur. The first NSW exercise to test the State's response to a pandemic was *Exercise Warning Shot* in 2003. In late 2005 a national exercise known as *Exercise Eleusis* evaluated the ability to manage an animal disease outbreak with human health risks. The first national exercise testing for a major human disease outbreak was *Exercise Cumpston* in October 2006. In addition NSW Health is planning to conduct *Exercise Paton* to test the ability of NSW hospitals to identify and respond to cases in the early stage of a pandemic.

**Chapter 2
Is the public health system preparing to respond to a full range of emergencies?**

NSW Health is focusing on preparedness for an influenza pandemic and modelling the likely impact using scenarios based on a "moderate", or 1968-type pandemic, and a "severe", or 1918-type pandemic. NSW Health continually monitors the risks of a pandemic, based on information from the World Health Organization.

NSW Health also monitors the risks of other infectious diseases, such as through participation in the national Communicable Disease Network Australia. It issues epidemiological reviews of selected infectious diseases and publishes an annual review. Although we found NSW Health to be very much aware of the risks associated with infectious diseases, we did not see any structured and systematic assessment of the threats they present to NSW, as outlined in the Australian risk management standard.

Monitoring and modelling are only parts of a risk assessment. Assessment also involves consideration of other factors such as the likelihood of an event occurring in the first place and the effects of actions available to deal with the risk. The aim is to ensure that efforts are optimally focused.

In our view, NSW Health needs to consider a more structured and systematic approach to the planning and risk assessment of major infectious diseases. Such a measure would assist in more informed decisions, greater transparency and improved capacity to manage competing demands on limited public health resources.

**Chapter 3
Is there likely to be sufficient and timely advice to all?**

NSW Health's surveillance system is a critical part of its preparedness. Its systems are well established and it has a program for their further development. It needs to continue to develop and test its surveillance systems and the capability of its contact tracing system to deal with a public health emergency.

There has been considerable emphasis on effective communications with the public. NSW Health has established improved systems for rapid communication of urgent advice to GPs and other medical practitioners and is working on further improvement.

There is also recognition of the need to communicate information about the situation clearly among both government and private health providers.
In NSW much of this information is collected and used at Area Health Service level. NSW Health developed an information system for use in *Exercise Cumpston*. The system relied on regular situation reports from the Area Health Services. There is scope to further develop such systems.

**Chapter 4
Is there likely to
be sufficient
capacity in the
health system?**

We were able to conclude that NSW was likely to have adequate supplies of vaccine and antiviral drugs, due to the size of the National Medical Stockpile. NSW Health is examining how this may be deployed, but actual plans will depend on circumstances at the time.

NSW Health has indicated that there is likely to be adequate laboratory capacity to handle a major outbreak. Further planning should confirm this.

Depending on its severity, a pandemic could severely stress the current healthcare system. The increase in patients requiring hospitalisation and critical care could result in shortages of staff, resources and supplies. We were unable to establish whether there was likely to be sufficient capacity. Key areas include emergency staffing needs, isolation facilities, intensive care units, assisted ventilation services, hospital beds and medical supplies.

NSW Health has identified some possible ways of temporarily increasing capacity. But there is further work to do to determine surge requirements, capabilities and formal escalation processes.

Response from NSW Health

Thank you for the opportunity to provide comments on the performance audit report Major infectious diseases outbreaks: readiness to respond.

The report acknowledges the demonstrated commitment from NSW Health to prepare the NSW public health system for major infectious diseases outbreaks, describes the many planning and preparedness initiatives that have been undertaken, and makes recommendations on how NSW Health might improve its readiness to respond. In this letter, I aim to provide some context to the challenges that exist in preparing for major infectious disease outbreaks, and describe how NSW Health aims to respond to the specific recommendations in the report.

"Major" infectious disease outbreaks are taken to mean those that have the potential to give rise to a significant public health emergency because of their capacity to cause illness, death, public fear and panic, and economic loss on a large scale. Such outbreaks have been recorded throughout history but not in recent times. However, certain events over the past decade have led to renewed concerns about major infectious disease outbreaks. With this increased concern, there has been a commensurate increase in preparedness activities around the world, including in Australia.

Major infectious disease threats over the past decade have included the outbreak of severe acute respiratory syndrome (SARS), the emergence of H5N1 avian influenza in domestic poultry flocks across Eurasia and Africa and the consequent perceived increased risk of an influenza pandemic developing, and the risks of bioterrorism. The report mostly focuses on these "large-scale" infectious disease threats but it also includes discussion of preparations for more "usual" communicable diseases outbreaks, such as measles, tuberculosis, Legionnaire's disease, and salmonellosis. It is important to differentiate between these two broad groups of infectious disease because the readiness to respond to each of them is at a different level.

Although this performance audit was focussed on the public health sector's readiness for a major infectious disease outbreak, it should be noted that responsibility for preparing for these events does not rest solely with the health sector. Since influenza pandemic preparedness activities have gathered momentum over the past two years, there has been a growing realisation that a whole-of-government framework is required in preparing for, and responding to, such an event. As a result, high-level working groups have been established at the federal and state levels to ensure collaboration between all relevant government sectors in pandemic planning and to prepare whole-of-government pandemic plans. I will confine my comments in the remainder of this letter to activities within the health sector.

The report correctly asserts that the majority of planning efforts by NSW Health for major infectious disease outbreaks is currently directed towards pandemic influenza. NSW is not alone in focussing on pandemic influenza preparedness - there is an Australia-wide, and indeed, a world-wide focus on pandemic preparedness - and there is good reason for this. Compared to other known major infectious disease outbreaks threats, influenza pandemics present the greatest potential risk to the public health owing to their ability to rapidly spread within a population, the mortality rate is likely to be high, and the entire population will be at risk at the same time. The magnitude of the threat to the public health posed by an influenza pandemic compared to other major infectious disease outbreaks means that preparing adequately for such an event will go a very long way to preparing for all major infectious disease threats.

There are thirteen recommendations in the performance audit report and these fall into two broad groups. The first group comprises six recommendations that acknowledge NSW Health's considerable preparedness efforts to date and urge a continuation of these efforts. NSW Health agrees that elements of planning and preparedness encompassed in these recommendations are, indeed, high priority areas and intends to implement them in full.

The second group of recommendations are those that recommend how NSW Health may improve current preparedness efforts. The seven recommendations in this group are listed below with comments and a planned course of action.

Recommendation. Establish a time-table to finalise all emergency and contingency plans.

Comment. *It is widely acknowledged that an effective overall response to a major infectious disease outbreak is crucially dependent upon (i) national consistency in policy around preparing for, and responding to, such an event, and, (ii) harmonisation of plans at the national, state, and local levels. The time-table for finalising some plans is therefore contingent upon outcomes at the Commonwealth level.*

Emergency plans are, by their nature, iterative documents. They need continual review and updating in light of new information or changes to higher order plans.

Planned course of action. *NSW Health will establish a timeline for completion of emergency and contingency plans. In addition, the value of consolidating some plans will be assessed to ensure clarity of planning documents and avoid duplication in plans.*

Recommendation. Consider building on influenza pandemic preparedness planning to develop broader contingency plans to address the emergence of other new, highly transmissible and/or severe infectious diseases.

Comment from NSW Health. Although the focus for the past two years has been on pandemic influenza preparedness, national plans that deal with other major infectious disease outbreaks have also been prepared, including plans for SARS, anthrax and smallpox.

Planned course of action. Preparing NSW for major infectious diseases emergencies will continue to focus on pandemic influenza. Following this, NSW Health will build on the experience when revising and developing plans for responding to other emergencies arising from major infectious diseases.

Recommendation. Apply the lessons learnt from Exercise Cumpston to further improve preparedness for major infectious disease emergencies.

Comment from NSW Health. Exercise Cumpston was a 3 ½ day national pandemic simulation exercise held in October 2006. It was an important opportunity to test national and state level pandemic plans for the early stages of a pandemic and was considered an extremely valuable event, with many lessons learned. These lessons are currently being captured and recorded during a series of state and national exercise debriefs to which NSW Health is playing a key role. Feedback to date from the Australian Government Department of Health and Ageing, the convenors of the exercise, and reiterated by international observers, is that Exercise Cumpston demonstrated an impressive ability of Australian states and territories to mount an effective response to pandemic influenza.

Planned course of action. NSW Health has already begun applying lessons learned from Exercise Cumpston to enhance state-wide preparedness for major infectious disease emergencies.

Recommendation. Formally establish and oversight a comprehensive program of training, testing and evaluation of plans at the state, area and facility level.

Comment from NSW Health. NSW Health has a demonstrated commitment for testing emergency plans to help ensure response capacity is kept current, as articulated in the State Health Plan, currently being revised.

The NSW Department of Health has responsibility for coordinating health emergency exercises that involve the whole state. Since 2003, NSW Health has been involved in one state-wide (Exercise Warning Shot in 2003) and two nation-wide (Exercise Eleusis in 2005 and Exercise Cumpston in 2006) infectious disease emergency simulations, and another state-wide exercise is planned for November 2006 (Exercise Paton).

NSW Area Health Services are responsible for planning and conducting health emergency exercises at the local level. Agreement between the Department of Health and Area Health Services to carry out such tests are written into the Population Health Service Agreement 2006-07, due for release by the end of 2006.

A training tool for exercising disaster plans at the health facility level, EmergoTrain, was purchased by NSW Health in early 2006. Although not specific for infectious diseases emergencies, there are many key response elements tested in EmergoTrain exercises that are generic for all types of emergencies, such as the facility surge capacity. A program of testing NSW health facilities is being rolled out across the state, which includes the testing of each of the metropolitan trauma centres at least once per annum, and eight major regional centres over the period 2007-2008.

Planned course of action. *NSW Health will continue to encourage and participate in national simulation exercises.*

NSW Area Health Services will continue to take the lead in the preparation and conduct of local exercises, with input and advice from the Department when required.

Recommendation. Establish a performance management framework with targets and indicators to assess progress in preparing for infectious disease emergencies.

Comment from NSW Health. *The need for a performance management framework for preparing for all types of disasters at the Area Health Service and health facility levels, and in the development of local surge capacity plans, was identified by NSW Health in 2005. Since then, such a framework has been developed in consultation with Area Health Services and it is anticipated to be in use by late 2006.*

A performance management framework is being incorporated into a revised version of the pandemic influenza plan template for NSW Area Health Services that is currently under development.

Planned course of action. *Once endorsed, the performance management framework currently under development for all types of disasters will be utilised in future preparedness activities for major infectious disease outbreaks.*

Recommendation. Consider a more structured and systematic approach to the planning and risk assessment of major infectious diseases to assist transparency and decision making.

Comment from NSW Health. *The Audit Office acknowledges that NSW Health continually monitors risks posed by major infectious diseases using a variety of methods and is very much aware of the risks posed by these threats. NSW Health does not, however, undertake a formal risk assessment of these threats using the Australian risk management standard AS/NZS 4360:2004 Risk Management. Applying this formal risk assessment method would require a redirection of current resources from other disease control activities, and it is uncertain whether the outcome would be an improvement on existing methods of risk assessment.*

Planned course of action. NSW Health will scope the utility and resource requirements involved in changing existing methods of assessing risk posed by infectious diseases to align with AS/NZS 4360:2004 Risk Management.

Recommendation. Develop distinct surge capacity plans within each area health service to manage emergency staffing needs, isolation facilities, intensive care units, assisted ventilation services, hospital beds and medical supplies.

Comment from NSW Health. During a large-scale infectious disease emergency, considerable additional strain will be placed on human and material resources in the hospital system and, in order for it to cope, will require a temporary change in usual practices. NSW Health has strategies planned to cope with this surge in demand for health services.

Planned course of action. NSW Health will continue with its planning efforts in this area.

Preparing a health system to respond to major infectious disease outbreaks is a major undertaking in that virtually every aspect of the health system will, in some way, be affected during the preparedness and response stages. It should be emphasised that the report gives a snapshot of preparedness activities at a particular point in time - these are continuing apace and level of readiness in NSW is improving commensurately.

I am very pleased with the level of co-operation that existed between NSW Health and the Audit Office in the preparation of the report, and thank the staff of both agencies for their professionalism and co-operation.

(signed)

Robert McGregor
Acting Director-General

Dated: 10 November 2006

1. Organisation

At a glance

> **The key question we wanted to answer was:**
>
> Is the public health system well organised to respond to an emergency?
>
> **Our assessment:**
>
> The public health system is well organised to respond to an emergency incident. It is increasingly better organised to respond to an infectious disease epidemic or pandemic, but there is more to be done.
>
> Public health system roles and responsibilities in responding to an emergency incident have been clearly designated. But further work is required to define the roles and responsibilities of outside bodies, whose roles are likely to be critical in a pandemic.
>
> A clearly defined command and control structure is in place for health emergencies. Area Health Services have initial responsibility for case management and containment. A whole-of-health, and possibly whole-of-state, approach would be used if the situation escalates.
>
> The completeness and quality of plans is an important indicator of preparedness. NSW Health has a high level emergency plan known as 'HEALTHPLAN', but most of the detailed plans that support it are incomplete and in draft form and not available for use. There is a NSW whole-of-state plan and a NSW Health plan for an influenza pandemic. But most of the plans that support this are incomplete and in draft form. The need for some of these plans is being reviewed. NSW Health also has plans for the management of some other types of infectious disease outbreaks, such as smallpox, which could be modified to suit types of disease outbreaks that are not documented.
>
> Until recently there was relatively little formal testing of plans, although experience was gained with outbreaks each year. The first NSW test of the State's response to a pandemic was *Exercise Warning Shot* in 2003. In late 2005 a national exercise known as *Exercise Eleusis* evaluated the ability to manage an animal disease outbreak with human health risks. The first national exercise testing for a major human disease outbreak was *Exercise Cumpston* in October 2006. This tested Australia's border control and quarantine plans as well as national and state level response arrangements. It also simulated disease containment and the transition to the maintenance phase in a community setting, including the deployment of antiviral drugs and establishment of fever clinics. In addition NSW Health is planning to conduct *Exercise Paton* to test the ability of NSW hospitals to identify and respond to cases in the early stage of a pandemic, including influenza patient identification, patient management, contact tracing, laboratory capacity and intra health sector communication.

1.1   What is a public health emergency arising from infectious diseases?

A public health emergency is an event that endangers the safety and health of persons and requires a significant, coordinated health response.

Health authorities manage infectious diseases on a daily basis. Normally, this is on a scale and frequency that is within existing resources. But some infectious diseases can cause a public health emergency by spreading rapidly in the community. These diseases include severe acute respiratory syndrome (SARS), smallpox, new forms of influenza and other newly emerging diseases.

A pandemic would stretch health resources

A major outbreak can occur when a new infectious disease emerges, to which no-one is immune. In the absence of immunity, the new disease can spread rapidly, causing worldwide epidemics or 'pandemics'. Pandemics caused by a new influenza virus are the most common of these. In the event of a pandemic, existing resources will invariably be stretched beyond their normal response capacity.

> Experts around the world agree that there is a small but realistic chance that sometime in the next year or two we could have an epidemic or a pandemic.
> Source: NSW Health, *Influenza Pandemic Communications Plan,* November 2005.
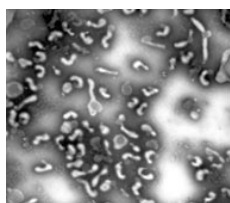
The World Health Organization has identified six phases for an influenza pandemic:

- phases 1–2 – interpandemic phases in which there is animal infection but no human infection.

- phases 3–5 – 'pandemic alert' phases with human cases, but only localised human to human transmission.

- phase 6 – a full pandemic with sustained human to human transmission in the general population.

At the time of the audit the world was threatened by an animal infection known as H5N1 avian influenza. The world was in global phase 3 (human cases but no human to human transmission), but there had been no animal or human infection in Australia.

The impact could be severe

There is no way to accurately predict the severity of a pandemic. The NSW Government has based its planning on the following set of assumptions:

- a symptomatic attack rate (percentage of people who will become sick) of 30%, which could result in more than 12,500 deaths in NSW over a two-month period

- the death rate could be more than triple the usual number of deaths from all causes over a two-month period

- absenteeism rates may be in the order of 30% to 40%

- the spread of disease can be limited by prevention and preparedness actions

- development of an effective vaccine may take some months

- antiviral medications will be in short supply
- significant disruption of social function and antisocial behaviour could occur
- there may be significant economic impact on NSW businesses and government.

Source: NSW Government, *Human Influenza Pandemic Plan,* August 2006.

The Australian Bureau of Agriculture Resources and Economics has estimated the economic impact to be a 6.6 per cent ($20 billion) reduction in New South Wales' gross domestic product.

1.2 Have public health roles and responsibilities in such an emergency been clearly designated?

Our assessment

Public health system roles and responsibilities in responding to an emergency incident have been clearly designated. But further work is required to define the roles and responsibilities of outside bodies, whose roles are likely to be critical in a pandemic.

Public health roles are well defined

The NSW Minister for Health is responsible for protecting the health and wellbeing of the people of NSW. Under the *Health Administration Act 1982* and the *Health Services Act 1997* he is supported by the Department of Health and the Area Health Services. This support includes public and community health, public hospitals, psychiatric hospitals, and emergency transport. These bodies under the control of the NSW Minister for Health are collectively referred to as NSW Health.

Public health roles and responsibilities in an emergency are well defined. Specific roles and responsibilities in an emergency situation are outlined in NSW HEATHPLAN and its supporting plans.

The Australian Government may assist the NSW Government in responding to an infectious disease emergency, such as an influenza pandemic by:

- developing national policy and broad national strategies in consultation with the States
- providing national capabilities to deal with pandemic influenza;
- administering the *Quarantine Act 1908* and border control measures;
- coordinating public health surveillance data and technical advice.

  Source: Australian Government, *National Action Plan for Human Influenza Pandemic*, July 2006

In the event of a major emergency the Australian Government Department of Health and Ageing would coordinate a national health response through the *Australian Health Protection Committee*, which includes:

- Australian Chief Medical Officer
- State and Territory Chief Health Officers
- Emergency Management Australia
- Australian Defence Force.

The *State Emergency and Rescue Management Act 1989*, *Public Health Act 1991*, and the *Essential Services Act 1988* provide additional powers and enable a whole-of -state support to NSW Health in a large-scale emergency.

Public health roles and responsibilities in an emergency are further specified in the State's emergency management framework, as outlined in the following section.

Roles of private health providers in a pandemic are less defined

The inclusion of private health providers, such as private hospitals and general practitioners, in pandemic planning is likely to be critical to the successful management of the pandemic.

We found that NSW Health had:
- held discussions with representatives of major private health providers
- discussed workforce issues
- directed Area Health Services to consider the role of private health facilities
- organised discussions on emergency department arrangements with the three NSW private hospitals that operate emergency departments.

NSW Health also indicated that it had:
- made a presentation to the NSW General Practitioners Council
- considered the role of general practitioners in relation to emergency services, noting that in rural areas general practitioners may be required to provide the emergency department response.

The general practitioners we contacted seemed unaware of NSW Health's plans, particularly at the Area Health Service level. This includes their role in surveillance, administration of anti-virals and vaccines. It also includes how they would link to area emergency management structures in an infectious disease emergency.

We found no formal agreements between Area Health Services and private health services generally as to roles and expectations in an infectious disease pandemic.

Examples of such agreements could include:
- jointly developed response plans at an Area Health Service level
- memorandums of agreement between Area Health Services and private hospitals in relation to resource management at area level.

Recommendation

We recommend that NSW Health conclude agreements with private health providers specifying roles and expectations in the case of an infectious disease pandemic.

1.3 Is there a clearly defined command and control structure?

Our assessment

A clearly defined command and control structure is in place for health emergencies. It needs some modification in order to ensure the full involvement of senior health management in managing an extended over-load on the health system.

Emergency response is clearly defined

The *State Emergency and Rescue Management Act 1989* requires that the State Disaster Plan identify who is responsible for controlling the response to an emergency. The Plan identifies NSW Health as the designated 'Combat Agency' for all health emergencies within NSW. A supporting plan, known as NSW HEALTHPLAN, sets out the relevant emergency arrangements.

If an infectious disease predominantly involves animals, with only minor risk to human health, the Department of Primary Industries would be the lead agency. NSW Health would play a supporting role with respect to human health issues, but would become the lead agency should the risk to human health increase significantly.

Area Health Services have initial responsibility

In the early stages of an outbreak, the Area Health Services are responsible for case management and containment within their area. Area Health Service Public Health Controllers work closely with the Area Health Service Functional Area Coordinators, who hold the delegated authority of the Area Chief Executives to control deployment of non-public health Area resources as necessary.

A whole-of-health approach would be used if the situation escalates

In an emergency the State Health Services Functional Area Coordinator could assume control to ensure an integrated whole-of-health response. The Health Services Disaster Control Centre would be made operational and the overall health response coordinated from there. In these circumstances, the Public Health Controller continues to lead population health operations. NSW Health's four other controllers (medical services, ambulance, mental health and communications) would lead their respective operations.

A whole-of-state response may be used in a pandemic

The State Disaster Plan provides for a coordinated response by all agencies involved in emergencies. This includes agencies in areas such as police, transport, agriculture, environment and community care.

In an influenza pandemic the Premier will chair the peak strategic and policy decision-making body known as the NSW Influenza Pandemic Committee. It will include the Deputy Premier, Minister for Health, Minister for Police, Minister for Emergency Services, Minister for Community Services, Chair of the State Emergency Management Committee, Director-General, Premier's Department, Director-General, NSW Health and Director-General, Department of Community Services.

At the request of NSW Health and the NSW Influenza Pandemic Committee, the State Health Services Functional Area Coordinator may then report directly to a State Emergency Operations Controller.

Senior management would be more involved in a pandemic

The provisions of NSW HEALTHPLAN are designed for rapid and effective management of emergency incidents. But NSW HEALTHPLAN and the emergency management framework have not previously been activated for a major infectious disease.

NSW Health has recognised that a different management approach would be needed to manage an extended over-load on the health system. This would require the close involvement of senior NSW Health management. NSW Health has established a Health Emergency Management Committee to:

- assist the Director-General in the preparation and review of all State health emergency planning documents
- advise the Director-General on governance arrangements for health emergency planning and response
- ensure the necessary emergency management plans and appropriate business continuity plans are in place across NSW Health
- ensure the structure for emergency management planning across NSW Health is regularly reviewed and updated
- ensure health entities identify, evaluate and monitor threats and hazards to the health of the community of NSW
- review systems for use in the control and coordination of health emergency operations
- ensure that appropriate communication networks are established within and between Area Health Services and the Department
- ensure specific hazard management guidelines are in place where required.
- ensure suitable emergency management training programs are in place across NSW Health
- monitor the conduct of training exercises to regularly test emergency management plans

The new committee is to comprise the Director-General, the Chief Health Officer, the Deputy Director-General, Health System Support, the Chief Executive, Ambulance Service, the State Health Services Functional Area Coordinator, and at least two Area Chief Executives.

1.4   Are plans and procedures in place?

Our assessment

The completeness and quality of plans is an important indicator of preparedness. NSW Health has a high level emergency plan known as 'HEALTHPLAN', but most of the specific plans that support it are incomplete and in draft form and not available for use. The need for some of these plans is being reviewed. NSW Health has a plan for an influenza pandemic that has been called 'interim'. But most of the plans that support this are incomplete and in draft form. NSW Health also has plans for the management of some other types of infectious disease outbreaks, such as smallpox, which could be modified to suit types of disease outbreaks that are not documented.

Emergency plans to respond to general health emergencies	NSW HEALTHPLAN outlines the NSW Health emergency management arrangements to coordinate a whole of health response in the event of any emergency. But we found some plans to be incomplete and three of the five health services supporting plans that support the NSW HEALTHPLAN to be in draft form, marked 'not for distribution':

- Medical (draft, May 2006)
- Public Health (draft, August 2006)
- Mental Health (draft, June 2006)
- Ambulance (November 2005)
- Health Communications (July 2005).

Area Health Services are required to have Area Health Service specific plans for major emergencies, although the examples we have seen have not been updated since 1999.

Hospitals have emergency plans, fashioned around response to an incident. Hospital Disaster Plans cover preparedness for major chemical, biological and radiation hazards.

Contingency plans are necessary for infectious disease emergencies	Infectious diseases pose a continual threat to public health. In particular, emerging Infectious diseases can cause an emergency by spreading rapidly in the community, beyond the capacity of available resources to manage. This requires additional contingency plans to address the:

- protection of the population at large
- a coordinated whole-of-health effort
- continuation of normal health service delivery
- provision of clinical care to those affected by the disease over a lengthy period, at a time when health resources are likely to be stressed.

Emphasis has been on the Influenza pandemic	Considerable effort has been directed to planning for an influenza pandemic. In 1999 the World Health Organization published the *Influenza pandemic plan - The role of WHO and guidelines for national and regional planning*. In 2005 the *WHO global influenza preparedness plan* updated and significantly revised its advice, addressing the possibility of the prolonged existence of an influenza virus of pandemic potential. Every country was urged to develop or update a national influenza plan.

The *Australian Health Management Plan for Pandemic Influenza* was revised and re-issued in June 2006. It emphasises a strategy of containment to 'buy time' during the months needed to develop and distribute an effective vaccine.

Interim Influenza Pandemic Action Plan	NSW Health issued its *Interim Influenza Pandemic Action Plan* in November 2005. The Plan provides:

- a description of the national, state and local structural arrangements for coping with a pandemic
- a description of the key elements of preparedness and response
- details of roles and responsibilities required in each phase of a pandemic.

The plan supports a NSW State influenza plan, which was released in August 2006. NSW Health's influenza plan requires supporting influenza pandemic plans to be prepared by area heath services.

Area Health Services prepared draft supporting plans in March 2006. NSW Health is re-drafting these plans for greater consistency and to take into account new information such as:

- an increased national emphasis on the strategy of containment
- new guidelines for infection control
- further developments in the management of pandemic influenza.

Considerable revision and development of the plans is taking place.

Planning for other infectious diseases

As different types of infection are spread in different ways, and require different forms of prevention, control and treatment, we expected to see similar plans for other key infectious diseases.

Hospital Infection Control Guidelines describe the steps that should be taken in an infectious disease outbreak. A NSW Health *Infection Control Policy* includes steps to manage an outbreak in a health care facility.

NSW Health's *Notifiable Disease Manual* contains *response protocols* for the key infectious diseases. These provide information for Area public health units on:

- reason for surveillance
- case definition
- notification criteria and procedure
- managing single notifications
- managing special situations (such as a measles outbreak in a school).

Where the special situation is an outbreak, if there is no specific plan to refer to (as for an influenza pandemic), the protocol may state that:

- an outbreak management team should be convened
- additional control measures should be considered.

We found three other plans, although two were still in draft form:

- *Anthrax Public Health Emergency Plan*, Draft August 2004
- *Smallpox Public Health Emergency Plan*, Draft September 2004
- *Legionnaires Disease Emergency Management Plan*, August 2006.

We were also shown Australian Government guidelines for anthrax and smallpox, and guidance material in the working documents of the *NSW Taskforce on SARS 2003*.

NSW Health also has plans for the management of some other types of infectious disease outbreaks, such as smallpox, which could be modified to suit types of disease outbreaks that are not documented.

We have not seen an overall plan to address the emergence of new, highly transmissible and/or severe infectious diseases.

The World Health Organization has noted:

> Blueprints for an influenza pandemic preparedness plan can easily be used for broader contingency plans encompassing other disasters caused by the emergence of new, highly transmissible and/or severe communicable diseases.
>
> Source: World Health Organization, *WHO checklist for influenza pandemic preparedness planning,* 2005

NSW Health's *Interim Influenza Pandemic Action Plan* states that much of it is applicable to the state response to other infectious diseases emergencies such as:

- the deliberate release of biological agents
- severe acute respiratory syndrome (SARS)
- other remerging or newly emerging infectious disease threats.

NSW Health has previously recognised the need for further development of planning for infectious disease emergencies:

> In the near future, local and state response plans for infectious disease emergencies including SARS and pandemic influenza will need to be developed further as new information becomes available. It would be useful to have standard protocols for patient triage, the use of antiviral drugs, and data collection. Local, state and national training and preparedness exercises will be useful in maximising the effectiveness of NSW Health's response in dealing with any infectious disease emergency.
>
> Source: NSW Health, *Infectious Diseases Emergencies in NSW: Planning a Way Forward – Workshop Summary,* December 2004

Some other jurisdictions incorporate their pandemic planning within an overall infectious diseases plan, as for example:

- New Zealand Ministry of Health, *National Health Emergency Plan: Infectious Diseases,* July 2004
- Tasmania, Department of Health and Human Services, *Major Epidemics Management Plan*, August 2005

Recommendation We recommend that NSW Health:

- establish a time table to finalise all emergency and contingency plans
- consider building on influenza pandemic preparedness planning to develop broader contingency plans to address the emergence of other new, highly transmissible and/or severe communicable diseases.

1.5   Have plans and procedures been tested?

Our assessment   Until recently there was relatively little testing of plans for an infectious disease emergency, due in part to the plans being incomplete or still in draft form. There is no formal program for regular testing and training and no means of routinely assessing preparedness of Area Health Services. The first NSW test of the State's response to a pandemic was *Exercise Warning Shot* in 2003. In late 2005 a national exercise known as *Exercise Eleusis* evaluated the ability to manage an animal disease outbreak with human health risks. The first national exercise testing for a major human disease outbreak was *Exercise Cumpston* in October 2006. This tested Australia's border control and quarantine plans as well as national and state level response arrangements.

Regular testing of plans is necessary to:
- identify gaps and weaknesses in a plan
- ensure staff are sufficiently familiar with the plan to put it into effect in an emergency.

NSW Health facilities have emergency plans that are exercised from time to time. But we found no formal program for regular testing and training in relation to infectious disease outbreaks.

There has been national testing of pandemic plans   The only formal large-scale exercise to test NSW's response to a pandemic was carried out in 2003. It was called *Exercise Warning Shot*.

In late 2005 a national exercise known as *Exercise Eleusis* simulated an outbreak of avian influenza in animals that also posed a risk to human health. The exercise evaluated the capability of industry and government to manage an animal disease outbreak with human health risks.

The first national exercise testing for a major human disease outbreak was in October 2006. Known as *Exercise Cumpston,* the majority of operational activities related to this exercise were conducted in Queensland. But there was some 'spill' of operational activity into NSW, and governance and communications arrangements were tested in all states.

The four-day operational phase created scenarios in Queensland simulating an international arrival at an airport containing suspected pandemic influenza cases. This tested Australia's border control and quarantine plans as well as national and state level response arrangements. It also simulated disease containment and the transition to the maintenance phase in a community setting, including the deployment of antiviral drugs and establishment of fever clinics. The Exercise also assessed national and local surveillance and response policies and systems; decision-making structures; coordination mechanisms; and the relationship between the Australian Government Department of Health and Ageing and other Australian Government agencies, states and territory governments, medical professional bodies, the private sector and non-government organisations.

NSW Health is undertaking further tests

In addition to *Exercise Cumpston*, the Department of Health and Ageing has funded NSW Health to test elements of the NSW Health Interim Influenza Pandemic Action Plan. *Exercise Paton* will test the ability of NSW hospitals to identify and respond to cases in the early stage of a pandemic, including influenza patient identification, patient management, contact tracing, laboratory capacity and intra health sector communication.

NSW Health has also acquired a training tool to simulate and test its surge capacity in procedures for handling major incidents.

Responses to real emergencies also provide valuable learning experiences for improving command and control structures. The SARS crisis in 2003 was a 'real life exercise' mirroring what would be expected in the early stages of an influenza pandemic.

Area Health Services are also expected to commit resources to plan for disaster services and to rehearse their plans on at least an annual basis. Most Draft Pandemic Influenza plans for the eight Area Health Services noted the need for testing/exercise of the plan. But we did not see programs for the regular testing and evaluation of plans. Three made no mention, two noted the need for testing but did not identify how or when; and three advised that the plan would be tested during the planned national exercise in 2006, *Exercise Cumpston*.

NSW Health is assessing the adequacy of Area Health Service pandemic plans

NSW Health has developed a standard template and checklist to assess an Area Health Service pandemic plan for completeness. It has also asked Area Health Service to consider how they would respond to different 1, 50, 1000, or 10,000 cases in different phases of a pandemic.

It identifies an increasing number of factors to be considered. Its general guidance notes and its uniformity should facilitate a much more consistent approach. But Area Health Services may respond with differing levels of preparedness, which may be more or less than what is needed.

The template does not contain enough information to allow this to be readily assessed. The template identifies activities, but sets no response standards, minimum resource requirements, milestones or deadlines.

To ensure full implementation of the plan at all levels, it is necessary to define progress indicators that can be used to measure progress. We have not seen a performance management framework with targets, indicators or a benchmark system that can be used to assess progress in preparedness for infectious disease emergencies. We have seen a proposal that the NSW Health Counter Disaster Unit work with Health Services to develop a performance management framework to test, monitor and review the adequacy of counter disaster preparedness.

Use of timelines and measures of progress
US Department of Health and Human Services
▪ shall be prepared, within 12 months, to continuously evaluate surveillance and disease reporting data to determine whether ongoing disease containment and medical countermeasure distribution and allocation strategies need to be altered as a pandemic evolves
Measure of performance: analyses of surveillance data performed at least weekly during an outbreak with timely adjustment of strategic and tactical goals, as required
▪ shall work with State, local, and tribal governments and private sector partners to develop and test plans to allocate and distribute critical medical materiel (e.g., ventilators with accessories, resuscitator bags, gloves, face masks, gowns) in a health emergency, within 6 months
Measure of performance: plans developed, tested, and incorporated into department plan, and disseminated to States and tribes for incorporation into their pandemic response plans.
Source: US Homeland Security Council, *National Strategy for Pandemic Influenza Implementation Plan*, May 2006

Recommendation   We recommend that NSW Health:

- apply the lessons learnt from *Exercise Cumpston* to further improve preparedness for major infectious disease emergencies.
- formally establish and oversight a comprehensive program of training, testing and evaluation of plans at the state, area and facility level
- establish a performance management framework with targets and indicators to assess progress in preparing for infectious disease emergencies.

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2.   Risk assessment

At a glance

> **The key question we wanted to answer was:**
>
> Is the system preparing for a full range of emergencies?
>
> **Our assessment:**
>
> NSW Health is focusing on preparedness for an influenza pandemic and modelling the likely impact using scenarios based on a "moderate", or 1968-type pandemic, and a "severe", or 1918-type pandemic. NSW Health continually monitors the risks of a pandemic, based on information from the World Health Organization.
>
> NSW Health also monitors the risks of other infectious diseases, such as through participation in the national *Communicable Disease Network Australia*. It issues epidemiological reviews of selected infectious diseases and publishes an annual review. But we did not see any structured and systematic assessment of the risks that these infectious disease threats present to NSW, as outlined in the Australian risk management standard.
>
> Monitoring and modelling are only parts of a risk assessment. Assessment also involves consideration of other factors such as the likelihood of an event occurring in the first place and the effects of actions available to deal with the risk.
>
> In our view, NSW Health needs to consider a more structured and systematic approach to the planning and risk assessment of major infectious diseases. Such a measure would assist in more informed decisions, greater transparency and improved capacity to manage competing demands on limited public health resources.

2.1 Has there been adequate risk assessment?

Our assessment

NSW Health has been modelling the impact of an influenza pandemic. The risks associated with a pandemic are being continually revised, based on information from the World Health Organization and national strategies.

The risks of other major infectious diseases are also monitored, and advised to public health units, based more on experience.

However, we did not find structured and systematic risk assessment processes for major infectious diseases, as outlined in the Australian risk management standard.

NSW Health has been modelling the impact of an influenza pandemic

NSW Health has been modelling the impact of an influenza pandemic using scenarios based on a "moderate", or 1968-type pandemic, and a "severe", or 1918-type pandemic. The risks associated with a pandemic are being continually revised, based on information from the World Health Organization and national strategies.

The modelling:

- provides a range of estimates of impact in terms of deaths, hospitalisations, and outpatient visits due to pandemic influenza
- compares the number of persons hospitalised, requiring ICU care and requiring ventilator support during a pandemic with existing hospital capacity.

Note that monitoring and modelling are only parts of a risk assessment. Assessment also involves consideration of other factors such as the likelihood of an event occurring in the first place and the effects of actions available to deal with the risk.

NSW Health was unwilling to provide detailed figures to us, as modelling was being revised.

By way of illustration, Canada's Ontario Health uses similar software and has projected the impact of a pandemic on hospital capacity as follows:

Table 14: Impact of Influenza with 35% Attack Rate on Hospital Capacity

35% Attack Rate 6 Weeks		Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Hospitals	Weekly admissions	7,320	10,370	12,811	12,811	10,370	7,320		
	Peak admission/day			1,996	1,996				
Hospitals	# hospitalizations	7,320	10,370	12,811	13,459	12,430	9,895		
	% hospital capacity	47%	66%	82%	86%	80%	63%		
ICU	# ICU admissions	1,098	2,054	2,628	2,825	2,754	2,236		
	% ICU capacity	73%	136%	174%	187%	182%	148%		
Ventilator	# on ventilators	549	1,027	1,314	1,413	1,377	1,118		
	% ventilator capacity	29%	54%	69%	74%	72%	59%		
Deaths	# of influenza deaths			1,442	2,043	2,523	2,523	2,043	1,442
	70% deaths in hospital			1,009	1,430	1,766	1,766	1,430	1,009

Note: The above numbers were calculated using FluSurge software developed by the U.S. Centers for Disease Control and Prevention (a version of the software can be found online at http://www.cdc.gov/flu/flusurge.htm). It utilizes population estimates for 2004 based on 2001 census data. FluSurge is designed to provide a sense of the impact of a pandemic on hospital capacity over a selected duration of weeks. The program differs slightly from the CDC's FluAidprogram (http://www2a.cdc.gov/od/fluaid/), which provides a range of estimates for the total impact of an influenza pandemic for a given area at a macro level.

Source: Ontario Health, *Pandemic Influenza Plan,* June 2005

NSW Health periodically reviews the risk of other infectious diseases

In 1997, as part of its planning processes, NSW Health conducted a risk assessment to prioritise public health issues for the Sydney Olympic Games. This assessment identified the major risks as: food-borne illness, terrorism, measles, rubella, pertussis, meningococcal and viral meningitis, tuberculosis, sexually transmissible infections, viral haemorrhagic fevers, blood-borne pathogens, water-borne illness, and Legionnaires' Disease.

In 2003 NSW Health identified its 'top 10' priorities for communicable disease surveillance, prevention, and control.

The 'top 10' Priorities for Communicable Disease Control in 2003

- disease outbreaks, including those caused by emerging diseases and the deliberate release of biological agents
- blood-borne pathogens (focussing on HIV, hepatitis C and hepatitis B)
- sexually transmissible infections (focussing on HIV, chlamydia, syphilis, and gonorrhoea)
- vaccine preventable diseases (focussing on measles, congenital rubella, invasive pneumococcal disease, invasive Haemophilus influenza type b disease, pertussis, and influenza)
- tuberculosis
- enteric disease
- meningococcal disease
- mosquito-borne diseases caused by flaviviruses
- infections caused by antibiotic resistant organisms
- infections associated with health care.

Source: NSW Health, *Priorities for Communicable Disease Control in New South Wales*, NSW Public Health Bulletin 2003.

In 2004 NSW Health organised a workshop *Infectious Diseases Emergencies in NSW – Planning a Way Forward*. This included presentations on the infectious disease threats likely to threaten NSW and lessons learnt from the 2003 *Exercise Warning Shot*.

NSW Health issues epidemiological reviews of selected infectious diseases. A publication called *The year in review: Communicable diseases surveillance 2005* reviewed trends in reports of notifiable diseases among NSW residents.

NSW Health advised that the risks associated with newly emerging infectious diseases are monitored nationally and internationally, and advised to public health units. During the audit the World Health Organization drew attention to the emergence of new strains of tuberculosis that are virtually untreatable using the drugs now available.

> The World Health Organization has expressed concern over the emergence of virulent drug-resistant strains of tuberculosis (TB) and is calling for measures to be strengthened and implemented to prevent the global spread of the deadly TB strains. This follows research showing the extent of XDR-TB, a newly identified TB threat which leaves patients (including many people living with HIV) virtually untreatable using currently available anti-TB drugs.
>
> Source: World Health Organization, media release dated 5 September 2006.

NSW Health advised that it uses the history of outbreaks in planning the response to contagious diseases other than newly emerging diseases. There have also been national risk assessments dealing with bio-terrorism.

A structured approach to risk offers more informed decisions

We did not find structured and systematic risk assessment processes. Such processes are outlined in the Australian risk management standard AS/NZS 4360:2004 Risk Management. The risks from key infectious diseases would need to be explicitly identified with their source, nature and existing prevention measures and controls. The processes would include risk analysis, evaluation and treatment decisions.

NSW Health advised that the modelling and risk assessments for the pandemic would to an extent cover the needs of other diseases with respiratory borne pathogens, such as SARS.

But different types of infection are spread in different ways, with different intensity and impact, and they require different forms of prevention, control and treatment. Some infectious diseases can affect large numbers of people, but not cause deaths. Some may be less common, but have higher associated mortality rates. How does one justify choosing to focus effort and resources on some infectious diseases, but not others?

Compared to implicit risk assessment, a structured approach to risk would assist in more informed decisions, greater transparency and improved capacity to manage competing demands on limited public health resources.

Recommendation

We recommend that NSW Health consider a more structured and systematic approach to the planning and risk assessment of major infectious diseases to assist transparency and decision making.

2.2   Are risk assessments up-to-date?

Our assessment

NSW Health continually monitors the risks of infectious diseases, such as through participation in the national *Communicable Disease Network Australia*. But we did not see an up to date assessment of the risks that these infectious disease threats present to NSW.

Risks of influenza pandemic are being revised

NSW Health's head office has been monitoring the risks associated with a pandemic based on information from the World Health Organization and national strategies. Some Area Health Services have been developing their own scenarios. However, we did not see Area Health Services using a consistent and up to date risk assessment for their pandemic planning.

Risks of other infectious diseases are monitored

NSW Health monitors and shares knowledge of infectious diseases in a number of ways. For example it contributes to the *Communicable Diseases Intelligence,* a quarterly publication of the Surveillance Branch, Office of Health Protection, Australian Government Department of Health and Ageing. The publication aims to provide information about communicable diseases in Australia to inform and assist those with responsibility for communicable disease control in a wide variety of settings.

Risk assessments for other infectious diseases are not up to date

In 2005 a one day NSW Health *Communicable Diseases Strategic Workshop* identified a range of factors that would have affected the 'top 10' priorities for communicable diseases identified in 2003.

Factors that may influence the 'top 10' priorities for communicable disease surveillance, prevention, and control in New South Wales.

- Threat of pandemic influenza
- Reality of SARS
- New strains of norovirus
- Increasing rates of syphilis, chlamydia
- Re-emergence of HIV
- Emergence of multi-resistance organisms
- New vaccines, eg varicella and HPV
- Improved surveillance technology
- Changing political interest in pandemic influenza, bio-terrorism and meningococcal disease.

Source: NSW Health, *Notes from the Communicable Diseases Strategic Workshop (Public Health Directors Forum Professional Development Day),* November 2005.

Although we found NSW Health to be very much aware of the risks associated with infectious diseases, we did not find up-to-date scenario development, impact and risk assessment and prioritisation to guide overall preparedness for infectious disease outbreaks, other than for pandemic influenza. A more structured and systematic approach to the planning and risk assessment of major infectious diseases, as recommended in the previous section, would facilitate this.

3. Early warning and timely advice

At a glance

> **The key question we wanted to answer was:**
>
> Is there likely to be sufficient and timely advice to all in cases of major infectious disease outbreaks?
>
> **Our assessment:**
>
> NSW Health's surveillance system is a critical part of its preparedness. Its systems are well established and it has a program for their further development. It needs to continue to develop and test its surveillance systems and the capability of its contact tracing system to deal with a large scale infectious disease outbreak.
>
> There has been considerable emphasis on effective communications with the public.
>
> NSW Health has established improved systems for rapid communication of urgent advice to GPs and other medical practitioners, and is working on further improvement.
>
> There is also recognition of the need to communicate information about the situation clearly among both government and private health providers. In NSW much of this information is collected and used at Area Health Service level. NSW Health developed an information system for use in *Exercise Cumpston*. The system relied on regular situation reports from the Area Health Services. There is scope to further develop such systems.

3.1 Are there adequate disease surveillance systems?

Our assessment

NSW Health's surveillance system is a critical part of its preparedness. Its systems are well established and it has a program for their further development. It needs to continue to develop and test its surveillance systems and the capability of its contact tracing system to deal with a large scale infectious disease outbreak.

The World Health Organization states that effective disease control relies on a strong surveillance and response mechanism. It is crucial for:

- priority setting
- developing cost-effective strategic plans
- resource allocation
- prompt detection of public health emergencies
- forecasting and prediction of epidemics
- assuring appropriate preparedness.

It is also important to understand the spread of the disease, detection of high-risk groups, monitoring and evaluation of intervention measures.

NSW Health has a number of disease surveillance systems

NSW Health has a number of disease surveillance systems for early detection of infectious diseases:

- mandatory notification of infectious diseases by medical practitioners, hospitals, laboratories, childcare directors and school principals – as required under the *NSW Public Health Act 1991* and regulations. A National Notifiable Disease Surveillance System coordinates this nationally

- clinical reports provided by NSW general practitioners to some participating area public health units. Seventeen GPs were involved in 2005, ten from metropolitan areas and seven from rural areas

- laboratory confirmed diagnoses notified by major public laboratories including the Institute of Clinical Pathology and Medical Research, the South East Area Laboratory Service, the South West Area Pathology Service, the New Children's Hospital, and the Hunter Area Pathology Service

- a *Public Health Real-time Emergency Department Surveillance System* which records real time data for a number of conditions from emergency departments in NSW

- passive reporting by clinicians of unusual clusters of illness

- regular updates on infectious disease outbreaks from the World Health Organization.

NSW Health has a public health network of eight public health units staffed by disease surveillance specialists (public health nurses, surveillance officers, environmental health officers and epidemiologists) with leadership from NSW Health's Centre for Health Protection. The network regularly communicates via email, telephone hook ups and face to face meetings to share intelligence and improve control methods. Training sessions for network members are held regularly.

The *Communicable Disease Network Australia* provides national coordination. It includes representatives from the Commonwealth and State governments and representatives of key organisations in the communicable diseases field. The group holds fortnightly teleconferences to share and evaluate the latest information and developments in communicable diseases surveillance.

The World Health Organization coordinates an international monitoring program for infectious diseases. Its *Global Outbreak Alert and Response Network* pools resources for rapid identification and response to outbreaks of international importance.

NSW Health issues periodic reports

NSW Health issues periodic reports, examples of which include the *Weekly Influenza Report, Infectious Disease Report, and Meningococcal Disease Update*.

NSW Health will also at times issue a media alert to the community. For example in May 2006 NSW Health issued a measles alert to the community amid rising concerns of an epidemic. Local public health units were asked to contact people, who may have a known exposure to the disease, to arrange vaccinations and provide advice about the symptoms of measles. The units identified 1760 contacts of the cases, of which 553 were assessed as potentially susceptible to measles and offered free vaccination. An update from an *Infectious Disease Report* on this disease is shown below:

Example of an Infectious Disease Report: Measles Update

The measles outbreak that began in March (with 10 cases) and continued through April (29 cases) and May (16 cases) in NSW appears to have subsided (2 cases with onset in June) - at least for the moment.

Measles continues to circulate in many parts of the world however, so outbreaks associated with infectious travellers will likely continue to occur from time to time while people remain susceptible.

Susceptible people are primarily those born after 1965 who have not received 2 doses of MMR vaccine.

Continued opportunistic promotion of vaccination for susceptible people (e.g., during health checks before overseas travel) remains an important prevention strategy. Early notification of cases to the local public health unit assists in the early containment of outbreaks.

Source: NSW Health, *Infectious diseases report – June 2006.*

Over the last several years, NSW Health has developed systems to routinely analyse disease data, as on the NSW Health website accessed 28 July 2006:

Measles notifications in NSW residents, by five year age group, sex and month of disease onset. 01Jul2005 – 30Jun2006

Last updated on: 27 July 2006
Excludes cases where sex or age is unknown.
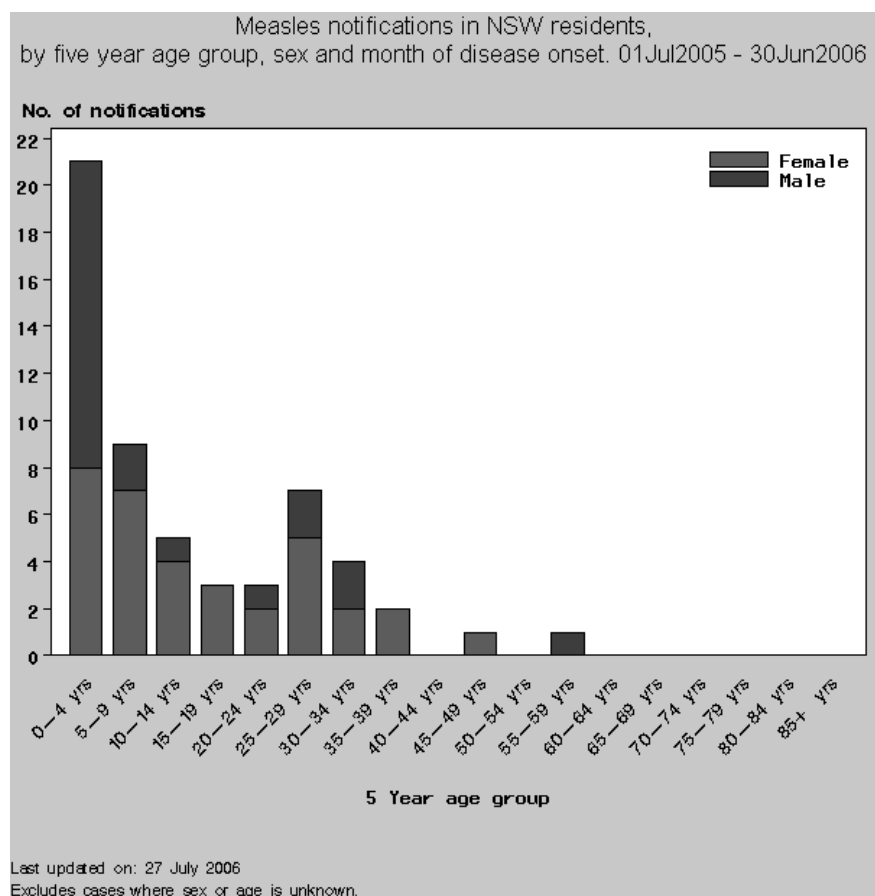
NSW Health is improving current systems

NSW Health periodically reviews the effectiveness of its surveillance. We saw for example epidemiological reviews of Legionnaires' disease, Salmonella and Tuberculosis. We also saw work to improve the modelling of infectious diseases that occur infrequently.

NSW Health is working to improve its current systems. Examples are:

- a program to redesign and re-implement the notifiable disease database information system. This would move it beyond a paper system and assist in helping to track down close contacts

- a project to enable electronic notification of cases of infectious disease, including influenza, from the top twenty laboratories by 2007. After this NSW Health plans to examine electronic notification by GPs

- a web based system known as *NetEpi* for collecting and sharing information on individuals as a disease develops. The system can handle large numbers of records and has been tested with 300,000 cases. (In Toronto during a major SARS outbreak the health authorities were tracking 15,000 contacts of potentially infected people).

Additional monitoring and surveillance may be needed during a pandemic

NSW Health has indicated that additional monitoring and surveillance may be needed during a pandemic, including:

- data collection on possible and confirmed cases of pandemic influenza

- surveillance of influenza-like illness in health care workers exposed to suspect, probable or confirmed pandemic influenza cases or their specimens

- monitoring the effectiveness of, and adverse events associated with, antivirals and vaccines

- border entry screening for influenza-like illness in travellers from affected regions

- border exit screening for influenza-like illness in people travelling to unaffected countries

- hospital-based surveillance of influenza and pneumonia cases (presentations to emergency departments, ICU bed occupancy, deaths), staff absenteeism, monitoring absenteeism amongst emergency services personnel.

NSW Health indicated that the web based *NetEpi* system can handle this type of information. In future, the re-design of the notifiable disease database information system will better serve this purpose.

Contact tracing plays an important role

Contact tracing plays a particularly important role in the control of infectious diseases, particularly in the early stages of the disease. Contact tracing requires officers to obtain information from records about a person (for example from medical records, hospital records and records of infectious disease notifications).

Contact information could include:

- the person's name and where the person may be contacted
- the name and whereabouts of any other person who may have transmitted the condition to the person or to whom the person may have transmitted the condition
- information about the circumstances in which the person may have been exposed to the condition, or may have exposed another person to the condition.

We have seen an assessment of NSW Health's contract tracing during the May 2006 measles outbreak. But there are relatively few cases of measles, largely due to the success of past vaccination programs. Based on the SARS experience, contact tracing in a pandemic could involve information on tens of thousands of individuals. Such action could extend to requiring organisations to provide lists of people for the purposes of contact tracing.

NSW Health has asked Area Health Services to prepare to:

- operate contact tracing 24 hours a day, seven days a week during the early stages of a pandemic
- provide significant surge capacity in case finding and contact tracing.

Recommendation   We recommend that NSW Health:

- continue to develop and test its surveillance systems for early detection of infectious diseases
- continue to develop and test the capability of its contact tracing system to deal with a large scale infectious disease outbreak.

3.2 Will there be sufficient and timely advice to all concerned?

Our assessment   There has been considerable emphasis on effective communications with the public. NSW Health has developed a communications strategy for use during infectious diseases emergencies that will be used during a pandemic.

NSW Health has established improved systems for rapid communication of urgent advice to GPs and other medical practitioners and is working on further improvement.

There is also recognition of the need to communicate information about the situation clearly among both government and private health providers. In NSW much of this information is collected and used at Area Health Service level. NSW Health developed an information system for use in *Exercise Cumpston*. The system relied on regular situation reports from the Area Health Services. There is scope to further develop such systems.

All parties involved in a response need to be able to communicate easily with one another as events unfold and critical information is acquired.

Emphasis on communications with the public	There has been considerable emphasis on effective communications with the public.
	NSW Health has developed a communications strategy for use during infectious diseases emergencies that will be used during a pandemic. Area Health Services are developing communications strategies.
	NSW Health has resources on its website that include state and national influenza plans, "A practical guide for medical practitioners" and fact sheets on infection control. NSW Health would maintain a 1800 number with recorded up-to-date messages.
	At a statewide level, the government may activate the *Public Information Coordination Centre* to achieve coordination between government agencies and between jurisdictions. The Centre would normally be staffed by media representatives from the many agencies involved in emergency response operations.
	At a national level coordination would be facilitated by the *National Health Emergency Media Response Network*. Additionally, in a pandemic, the Australian Government plans a national human health public information campaign to support the community through education and preventive strategies.
	The NSW Government, in an attachment to the *NSW Influenza Pandemic Plan,* has prepared a list of questions and answers for the community – such as *What if I get sick?*
Communications with GPs are being improved	In 2004 the NSW SARS Taskforce recommended that NSW Health establish improved systems for rapid communication of urgent advice to GPs and other medical practitioners. It indicated that this could include:

- systems using email, facsimile, print media, mobile phone networks
- rapid distribution of written materials through mail or via services such as pathology couriers.

NSW Health has purchased an address list and has a fax based system, as all general practitioners are expected to have the necessary access. NSW Health is presently conducting a survey of GPs to assess the effectiveness of faxed 'alerts' sent to them during a recent measles outbreak.

We considered whether NSW Health also needs to explore the use of email, particularly if an objective is to encourage better communications from GPs to NSW Health. However, a recent survey of GPs indicates that, whilst an increasing number use computers, only half presently use email. This suggests to us that NSW Health should develop a range of improved systems for communications with GPs and GP practice managers, including email and fax (and perhaps giving them the choice).

In addition, NSW Health has an agreement to utilise the Royal Australian College of General Practitioners' disease alerts communication network. This network has been used in the past for the distribution of alerts and information about SARS, avian influenza and bio-terrorism risks.

Statewide surge management information system

There is recognition of the need for systems for communicating information about the situation and the response clearly and effectively among both government health and private health providers.

This requires the collection of relevant information and the World Health Organization has recommended the development of a contingency plan for this purpose:

> for ongoing monitoring of information, for assessment of impact and resource needs during the pandemic phase (e.g. morbidity, mortality, workplace absenteeism, regions affected, risk groups affected, health-care workers and other essential workers' availability, health-care supplies, bed occupancy/availability, admission pressures, use of alternative health facilities, mortuary capacity).
>
> Source: World Health Organization, *WHO global influenza preparedness plan,* 2005

NSW Health has information on its own system, including a new bed management system. It is investigating use of a web based system that can show the geographical location of hospital capacities, the location of anti virals and protective equipment and ventilated beds. NSW Health also has some information on private health facilities.

But an information system to help manage a major infectious disease outbreak on a whole-of-state basis would likely need to bring all the information relevant to the surge together in real time to report:

- Staffing relative to number of patients
- Number of available intensive care unit beds
- Number of available medical beds
- Number of available emergency department beds
- Number of patients and/or waiting time in the emergency department
- Number of admitted patients waiting for inpatient beds (in the emergency department or elsewhere)
- Number of hospitals on emergency diversion
- Shortages of medical supplies or equipment.

The emergency information system in New York provides an example.

Tracking Resources in an Emergency

New York State's Health Emergency Response Data System (HERDS)

During an emergency event, the HERDS is a critical component of New York State's emergency response system.

HERDS serves four principle functions:

- collection of information necessary for effective resource planning

- surveillance of specific disease conditions or detection of patterns of illness via hospital and ED admissions

- monitoring the resource needs and availabilities of healthcare facilities during a public health emergency

- tracking of patients involved in a mass casualty event.

HERDS can provide a snapshot view of critical data, needs and surpluses across a locality, a region or the state during an event or a longitudinal view of data across designated reporting periods through specially designed reports.

HERDS provides a mechanism to ensure that hospital resource needs are formally registered with the health desk of the Office of Emergency Management. This information can then be reviewed, analyzed and evaluated by the New York State Department of Health, and/or a Multi-agency Coordinating Committee which in turn makes recommendations on necessary actions through the Incident Command System at the state or local Office of Emergency Management.

Source: New York State Department of Health, *Pandemic Influenza Plan*, February 2006.

In NSW much of this information is collected and used at Area Health Service level. NSW Health developed an information system for use in *Exercise Cumpston*. The system relied on regular situation reports from the Area Health Services. There is scope to further develop such systems.

In the next chapter we focus further on the need to manage the surge in demand for health resources that will result from a major infectious disease outbreak. This includes a need to bring all the information relevant to the surge in demand together in real time.

Recommendation

We recommend that NSW Health:

- continue to improve communication mechanisms with those, such as GPs, likely to be affected in major infectious disease outbreaks

- continue to develop systems to bring all the information relevant to the surge in demand for health resources together in real time.

4. Capacity to respond

At a glance	**The key question we wanted to answer was:**
	Is there likely to be sufficient capacity in the health system to effectively respond to a major infectious disease outbreak?
	Our assessment:
	We were able to conclude that NSW was likely to have adequate supplies of vaccine and antiviral drugs, due to the size of the National Medical Stockpile. NSW Health is examining how this may be deployed, but actual plans will depend on circumstances at the time.
	NSW Health has indicated that there is likely to be adequate laboratory capacity to handle a major outbreak. Further planning should confirm this.
	Depending on its severity, a pandemic could severely stress the current healthcare system. The increase in patients requiring hospitalisation and critical care could result in shortages of staff, resources and supplies. We were unable to establish whether there was likely to be sufficient capacity. Key areas include emergency staffing needs, isolation facilities, intensive care units, assisted ventilation services, hospital beds and medical supplies.
	NSW Health has identified some possible ways of temporarily increasing capacity. But there is further work to do to determine surge requirements, capabilities and formal escalation processes.

4.1 Are there likely to be adequate supplies of vaccine and antiviral drugs?

Our assessment The Australian Government has established a large stockpile that should ensure adequate supplies of vaccine and antiviral drugs. NSW Health is examining how this may be deployed, but actual plans will depend on circumstances at the time.

We have asked what are immunisation and anti viral drug strategies that would be adopted for use in NSW? We looked for guidance on which groups would be given what, what stocks are likely to be needed and what is planned to be available?

NSW Health has had major vaccination programs NSW Health has conducted comprehensive vaccination programs in the past. For example, NSW Health report that the *NSW Adolescent Vaccination Program 2004* was the most comprehensive high school vaccination program ever undertaken in Australia. The program offered meningococcal C vaccination, hepatitis B vaccine and diphtheria, tetanus and whooping cough vaccine to school students. But only a little over half the students were vaccinated. In Australia vaccination is not compulsory.

National Medical Stockpile may be deployed in a health emergency The National Medical Stockpile was established by the Australian Government in 2002 for deployment during a health emergency. The stockpile is designed to supplement existing medical stocks kept in the Australian hospital system. The stockpile includes a range of vaccines, antibiotics, chemical antidotes and diagnostic tests.

The Australian Department of Health and Ageing has primary responsibility for coordinating the procurement and distribution of vaccines to the states and territories during an influenza pandemic. It has issued general criteria for use of the National Medical Stockpile. The states and territories will be responsible for providing the vaccine to their populations according to nationally-agreed priority groups. Deployment plans will at the time depend on factors such as the nature of the disease, the vulnerability of those most affected, and its geographical spread

Influenza pandemic vaccine supplies have been ordered

The Australian Government has secured contractual commitments for the production of 50 million doses of an influenza pandemic vaccine, should such a vaccine be developed. As two doses of vaccine per person are considered sufficient, it can be seen that there should be enough vaccine for the whole population.

It may be months before a vaccine becomes available

However, due to the lead time required to manufacture a new vaccine, it is likely to take several months after the onset of a newly emerging infectious disease before a vaccine first becomes available.

Until a vaccine becomes available, other measures to protect the population would have to be utilised, such as:

- personal hygiene
- personal protective equipment
- isolation of affected persons
- antiviral drugs.

Antiviral drugs could help plug the gap

If available in sufficient quantities, antiviral drugs could potentially be valuable in the initial response to the pandemic, especially if no effective vaccine is available.

The Australian Government has acquired a large stockpile of antiviral drugs for influenza, although it notes that the antivirals in the stockpile are a scarce resource when considered against expectations and need. NSW Health also has a small stockpile.

Prioritisation is an essential exercise that needs to be communicated transparently to the public. The *Australian Health Management Plan for Pandemic Influenza* indicates priority groups for antivirals, depending on the phase of the pandemic, the work people do and the risk of exposure during such work.

> Over 12 weeks, when containment has failed, approximately 300,000 people will receive continuous pre-exposure prophylaxis and 380,000 people will receive post-exposure prophylaxis/ treatment. Expansion of the stockpile will provide for 665,000 and 860,000 people, respectively, when complete by June 2007.
>
> Source: *Australian Health Management Plan for Pandemic Influenza,* 2006.

NSW Health has calculated that the stockpile of antivirals should be sufficient to meet the needs of health care workers.

4.2 Is there likely to be adequate capacity to detect and correctly identify biological agents?

Our assessment NSW Health has indicated that there is likely to be adequate laboratory capacity to handle a major outbreak. Further planning should confirm this.

During a major infectious disease outbreak laboratories are likely to face a significant surge in demand for diagnostic tests, as well as experiencing increases in staff absenteeism. The greatest need is likely to arise in an influenza pandemic.

We looked at whether laboratories have been assessed to have adequate capacity and necessary staff. They need to be able to test clinical and environmental samples to identify an agent promptly. Then proper treatment can be started and infectious diseases prevented from spreading.

The *NSW Interim Influenza Pandemic Action Plan* notes the need to develop plans to respond to the surge in demand for diagnostic tests and for laboratory personnel:

- In order to have an adequate statewide capacity to detect novel influenza strains in humans, certain public health laboratories have developed diagnostic tests for H5N1 avian influenza, and are developing tests for other novel influenza strains that have the potential to become pandemic strains.
- Robust serological tests will also need to be available for use during a pandemic.
- During the Inter-pandemic and Pandemic Alert periods, laboratories will develop plans to respond to the surge in demand for diagnostic tests and for laboratory personnel.
- The Laboratory Subcommittee of the IDEA Group will develop protocols for specimen collection and diagnostic workup of patients suspected of having avian or pandemic influenza.
- The NSW Microbiology Laboratory Network comprises representatives from public and private laboratories, Area Health Services, and the Centre for Health Protection of NSW Health. It provides an interface for public and private laboratory sectors to discuss laboratory issues relating to avian and pandemic influenza.

Source: NSW Health, *NSW Interim Influenza Pandemic Action Plan*, November 2005.

The NSW Health, *Checklist For Area Health Service Plans for an Influenza Pandemic,* March 2006 asked *Does the plan identify the current laboratory capacity to process diagnostic tests?*

NSW Health has discussed possible scenarios with the NSW Microbiology Laboratory Network and noted:

- most laboratories perform simple tests that cannot distinguish between flu strains
- services are not generally provided outside normal office hours
- the laboratory network could handle several hundred cases a day.
  Source: NSW Health, NSW Microbiology Laboratory Network, minutes of meeting 26 May 2006

When we asked NSW Health about this, they indicated to us that they did not believe laboratory capacity would be a problem as:

- it was only in the early stages of a pandemic that laboratory diagnosis was particularly important, and there was sufficient capacity for the early stages

- the public health system's South East Area Laboratory Service and Westmead Institute of Clinical Pathology and Medical Research would provide a 24 hour a day service

- a new laboratory would be opened at the end of 2006 at Westmead, adding significant capacity

- private laboratories would not be purposefully collecting pandemic influenza specimens.

Recommendation   We recommend that NSW Health continue to develop its plans to respond to the surge in demand for diagnostic tests and for laboratory personnel.

4.3   Is there likely to be sufficient expertise and capacity to diagnose and treat all those affected?

Our assessment   NSW Health has identified some possible ways of temporarily increasing capacity. But there is further work to do to determine surge requirements, capabilities and formal escalation processes. NSW Health needs to undertake a rigorous analysis of requirements using its infectious disease models, and compares this to the potential capacity of staff, resources and supplies. Without this, it is impossible to know if it will have sufficient expertise and capacity to treat all those affected.

Demands in a pandemic are likely to greatly exceed normal capacity   The greatest need for surge capacity would arise in an influenza pandemic, as demands for healthcare resources are likely to greatly exceed normal capacity. Surge capability will need to be highly organised within the health system, if it is to effectively respond.

Areas that could particularly limit the ability of a hospital to handle increased surge capacity include:

- emergency staffing needs
- increased demand for isolation
- intensive care units
- assisted ventilation services
- hospital beds
- consumable and durable medical supplies.

Surge capacity could be further limited by the likelihood that health care personnel might themselves be sick or be called upon to care for sick family members at home.

Emergency staffing needs are being explored

Area Health Services identified a number of possible ways to temporarily increase staffing, as for example:

- staff from operating theatres and surgical wards could be redeployed, if elective surgery was cancelled
- community health nursing staff, such as early childhood nurses may be deployed to provide vaccination or antiviral medication to groups determined to be in need of prophylaxis
- some allied health staff and medical students, as an example, may be redeployed to other roles eg vaccination teams, staging facilities.
- health promotion staff may be redeployed to assist the public health unit in risk communication, to staff "hotlines" or to undertake surveillance
- increased involvement of private practitioners in hospitals
- using emergency services workers, volunteers, dentists, retired general practitioners.

The Area Health Services indicated that the capacity available from such avenues was yet to be determined. NSW Health advised that Workforce issues around alternate models of care during an influenza pandemic are being addressed by the NSW Health Pandemic Influenza Workforce Taskforce. NSW Health has approached registration groups about mapping the availability of people with the skills that would be needed in a pandemic.

Area Health Services can also increase capacity though more routine measures:

- deferring staff holidays and leaves of absence until the pandemic ends
- working longer shifts where staff are willing and health care is not compromised
- recruiting agency staff
- re-assigning non-clinical staff to clinical and clinical support functions
- cross-training clinical staff for influenza care and other essential services during a pandemic and other large-scale emergencies.

But we have not seen details in relation to:

- plans to boost the public health work force
- plans to address unmet staffing needs in the hospital
- the minimum number and categories of personnel needed to care for a group of patients with pandemic influenza (necessary in order to project staffing needs)
- criteria for declaring a "staffing crisis" that would enable the use of emergency staffing alternatives
- associated training programs for staff.

Special clinics and staging facilities are being planned

In 2004 the NSW Taskforce on SARS reported that should an epidemic of SARS occur in NSW, existing systems would rapidly be put under strain. It recommended that all Area Health Services report on proposed early management of possible SARS cases and their contacts using a framework provided by NSW Health:

> Each Area's plan needs to address the development of proposed Fever Clinics. This would entail nominating facilities and staff for the screening, triage, assessment, and isolation of cases. Consideration also needs to be given to 'staging facilities' for those that require observation but not acute hospital care.
>
> Source: NSW Health, *Key recommendations of the NSW Taskforce on SARS,* 2004.

NSW Health is finalising a draft policy and guidelines. It has issued draft guidelines for emergency departments that require establishment of:

- additional screening points in the early stages of an outbreak
- special clinics during a pandemic.

It is envisaged that emergency departments throughout NSW will be capable of establishing such clinics within 12 hours to:

- decrease patient presentations to Emergency Departments and general practices, thereby allowing those facilities to continue their core business and reducing the risk of transmission within those settings

- to minimise the number of health care workers exposed to patients with influenza, and to ensure that those staff who are allocated to the assessment and care of influenza patients maintain optimal infection control

- allow the spread of the disease to be delayed through case isolation, rapid treatment and the provision of antivirals and personal protective equipment to those at risk.

  Source: NSW Health, *Guidelines for establishing a Fever Clinic during an influenza pandemic in NSW*, March 2006.

Prior to the onset of a pandemic, each Area Health Service is required to identify sites for a clinic in, or close to, all hospitals with an emergency department. We have seen no details of the sites selected by this process.

The *NSW Interim Influenza Pandemic Action Plan* identifies a need for 'staging facilities' to accommodate patients where it is impractical to manage them at home or in a hospital.

Prior to the onset of a pandemic, each Area Health Service is required to identify sites for staging facilities using a framework developed by NSW Health. We have seen no details of the sites selected by this process.

Isolation facilities within hospitals need to be assessed	The *NSW Interim Influenza Pandemic Action Plan* identifies the ability to isolate patients with communicable respiratory infections as a key method of containment. Isolation facilities within hospitals, including negative pressure rooms, are an important component of this.

It notes that:

- there are a limited number of isolation rooms within NSW health care facilities
- NSW Health is responsible for keeping information relating to isolation facilities in NSW up to date
- the Australian Government initiative has purchased portable machines designed to transform a positively pressured room into a negative pressured one.

Once the pandemic virus reaches the stage of sustained transmission, other containment strategies will be needed for hospitalised patients such as:

- strict infection control practices
- designated influenza hospitals
- moving patients.

Bed capacity needs to be assessed	Based on what we have seen from some Area Health Services and other jurisdictions, there are a number of measures that NSW Health could take, such as:

- manage bed supply and demand for a pandemic on a statewide basis
- identify areas that could be utilised for expanded bed space
- review and revise admissions and discharge criteria for times when bed capacity is critically short
- work with home healthcare agencies to arrange at-home follow-up care for patients who have been discharged early and for those whose admission was deferred because of limited bed space
- review and refine the criteria hospitals currently use for temporarily canceling elective surgical procedures during surge periods. Plans should also be made for determining what and where emergency procedures will be performed during a pandemic
- additional hospital bed capacity may be created by setting up field hospitals and using auxiliary sites such as shelters, schools, religious facilities, nursing homes, hotels and day care centres.

The need and extent of such measures would depend on the likely capacity shortfall.

In December 2005, NSW Health participated in a *National Capability Audit* to guide the planning of resources. We understand that a summary of usual bed stock and disaster/surge stock was detailed, along with the estimated acute bed capacity needed during a pandemic on a weekly basis. NSW Health declined to provide this information to the audit, on the basis that the information was the property of the Commonwealth.

NSW Health has been undertaking modelling and analysis of bed capacity, but this information was not made available to us.

Consumable and durable supplies need to be assessed

Similarly it is important to examine whether the health system will have adequate consumables and durable supplies. Such actions could include:

- Inventory existing supplies and estimate resources required to address patient needs during pandemic.
- Consider stockpiling enough consumable resources such as masks for the duration of a pandemic wave (6-8 weeks).
- The existing system for tracking available medical supplies in the hospital should be evaluated as to whether it is capable of detecting rapid consumption, including PPE. Improve the system as needed to respond to growing demands for resources during an influenza pandemic.
- Assess anticipated needs for consumable and durable resources, and determine a trigger point for ordering extra resources. Estimate the need for respiratory care equipment (including mechanical ventilators), and develop a strategy for acquiring additional equipment if needed.
- Anticipate needs for antibiotics to treat bacterial complications of influenza and determine how supplies can be maintained during a pandemic.
Source: New York State Department of Health*, Pandemic Influenza Plan*, February 2006.

We found that health-care supplies such as protective equipment, antibiotics, reagents, and medical equipment were mentioned in Area Health Service plans. However, none gave estimates of the magnitude of need. NSW Health advised that it was developing plans for a centrally managed statewide medical stockpile.

There needs to be more focus on surge planning

In 2005 the *WHO global influenza preparedness plan* urged each country to develop surge-capacity contingency plans for the internal management of domestic resources and essential workers during a pandemic.

In July 2006 Area Health Services were asked to identify how they could expand public health capacity to respond to a scenario involving:

- 500 pandemic influenza cases in metropolitan areas, 300 cases in rural areas
- presentations over a 30 day period
- each case involving 25 other contacts.

Victoria is developing a distinct surge capacity plan on a whole-of-state basis:

> **Victorian Health Services Surge Capacity Plan**
>
> Key elements include:
>
> - mapping the service indicators and data/sources captured in the review of capability and capacity, and investigating the use of geospatially based systems
>
> - identifying escalation processes and trigger points for demand management and related authority levels
>
> - identifying contingency arrangements at health service level and state level
>
> - inter-jurisdictional arrangements.
>
> Source: Victorian Department of Human Services, *Strengthening emergency management capability and capacity 2005-07*, 2005.

Issues related to surge capacity will have been addressed when:

- A plan is in place to address unmet staffing needs in the hospital.
- The minimum number and categories of personnel needed to care for a group of patients with pandemic influenza has been determined.
- Criteria for declaring a "staffing crisis" that would enable the use of emergency staffing alternatives have been defined.
- Strategies to increase bed capacity have been identified
- A threshold has been established for canceling elective admissions and surgeries
- Memorandums of agreement have been signed with facilities that would accept non-influenza patients in order to free-up bed space
- Areas of the facility that could be utilized for expanded bed space have been identified
- A primary plan and contingency plan to address supply shortages has been developed.

    Source: Los Angeles County Department of Health Services, *Pandemic Influenza Plan Acute Care Hospital Settings*, Draft 3, January 2006.

Recommendation We recommend that NSW Health develop distinct surge capacity plans within each Area Health Service to manage emergency staffing needs, isolation facilities, intensive care units, assisted ventilation services, hospital beds and medical supplies.

Appendices

Appendix 1   About the audit

Audit Objective

The audit examined whether the NSW public health system is ready to respond to a public health emergency arising from a major infectious disease outbreak.

Lines of inquiry

In reaching our opinion against the audit objective, we sought to answer the following questions:

1. Is the public health system well organised to respond to an emergency?
2. Is the public health system preparing to respond to a full range of emergencies?
3. Is there likely to be sufficient and timely advice to all in cases of major infectious disease outbreaks?
4. Is there likely to be sufficient capacity in the health system for cases of major infectious disease outbreaks?

Audit criteria

In answering the lines of inquiry, we used the following audit criteria (the 'what should be') to judge performance. We based these standards on our research of current thinking and guidance on better practice. They have been discussed, and wherever possible, agreed with those we are auditing.

For line of inquiry 1, we assessed the extent to which:

- Public health system roles and responsibilities in an emergency have been clearly designated
- A clearly defined command and control structure is in place for health emergencies
- Plans and procedures are in place to describe how the public health system would manage and coordinate an emergency response. The plans indicate specific actions during each phase of the emergency
- The plans have been tested in an exercise at the state, regional and facility level.

For line of inquiry 2, we assessed the extent to which:

- There has been adequate scenario development, modelling, impact and risk assessment and prioritisation to guide overall preparedness
- Risk assessment is up-to-date.

For line of inquiry 3, we assessed the extent to which:

- Public health departments have adequate disease surveillance systems and epidemiologists to detect clusters of suspicious symptoms or diseases in order to facilitate early detection of disease and treatment of victims
- All parties involved in a response will be able to communicate easily with one another as events unfold and critical information is acquired. This includes communicating information about the situation and the response plan clearly and effectively among government health officers, providers, and the public (including when and where to go for treatment).

For line of inquiry 4 , we assessed the extent to which:

- There are plans for the purchase and distribution of vaccine, including defining priority groups to be vaccinated. There are plans to mitigate the effects of potential shortages of vaccines and antiviral drugs in the event of an epidemic, including travel restrictions and quarantine management
- Laboratories have been assessed to have adequate capacity and necessary staff to test clinical and environmental samples in order to identify an agent promptly so that proper treatment can be started and infectious diseases prevented from spreading
- The workforce has been assessed as adequate to respond to public health threats. This includes the expertise and capacity to evaluate, diagnose, and treat the large numbers of patients that would present during a public health emergency. Hospital facilities, including beds, assessed as sufficient.

Audit scope

The audit focused on NSW Health, Area Health Services, individual hospitals, and other elements of the NSW public health system. Other agencies included the NSW Office for Emergency Services. Key stakeholders included elements of the private health system, the Health Professional Associations, Health Services Union, Australian Medical Association and the NSW Nurses Association.

The audit did not seek to:

- duplicate reviews already conducted in relation to this topic
- review the activities of other State agencies that might support NSW Health in a whole-of-state response to a pandemic
- review the activities of Federal agencies that might have responsibilities in this area
- question the merits of Government policy objectives.

Audit approach

We acquired subject matter expertise by:

- interviewing staff and examining relevant documents, including guidelines, reports, studies, strategies and reviews relating to public health emergencies
- interviewing key stakeholder representatives
- drawing comparisons where appropriate with other states and countries
- reviewing government and best practice guidelines relevant to the above, including guidance from the World Health Organization and the Australian risk management standard AS/NZS 4360:2004 Risk Management.

Audit selection

We use a strategic approach to selecting performance audits which balances our performance audit program to reflect issues of interest to Parliament and the community. Details of our approach to selecting topics and our forward program are available on our website.

Audit methodology
Our performance audit methodology is designed to satisfy Australian Audit Standards AUS 806 and 808 on performance auditing, and to reflect current thinking on performance auditing practices. We produce our audits under a quality management system certified to International Standard ISO 9001. Our processes have also been designed to comply with the auditing requirements specified in the Public Finance and Audit Act 1983.

Acknowledgements
We gratefully acknowledge the co-operation and assistance provided by NSW Health. In particular, we wish to thank our liaison officers and staff who participated in interviews, assisted with document review or provided other material relevant to the audit.

We were also assisted by discussions with a number of external bodies including the Royal Australian College of General Practitioners, the NSW Nurses Association, the Health Sector Union and the Australian Medical Association.

Audit team
Our team leader for this performance audit was Chris Yates, who was assisted by Brian Holdsworth. Sean Crumlin provided direction and quality assurance.

Cost
Including staff costs, printing costs and overheads the estimated cost of the audit is $225,000.

Appendix 2   Glossary

Area Health Service
Area Health Services are the administrative units of the NSW Department of Health, defined by geographical boundaries, which are responsible for the administration of the NSW Department of Health's policies and responsibilities in that Area.

Epidemic
The occurrence of an illness in a locality that is clearly in excess of what is normally found.

Emergency
An emergency due to actual or imminent occurrence (such as fire, flood, storm, earthquake, explosion, terrorist act, accident, epidemic or warlike action) which: endangers, or threatens to endanger, the safety or health of persons or animals in the State, or destroys or damages, or threatens to destroy or damage, any property in the State, being an emergency which requires a significant and coordinated response.

Fever clinic
Fever clinics are facilities discrete from existing hospital emergency departments for assessing and triaging symptomatic individuals during an infectious disease emergency. Patients assessed in fever clinics would be assessed as being appropriate for care at home, as requiring further assessment and possible admission to designated influenza hospitals, or as requiring care in a 'Staging Facility', according to their risk of disease, severity of illness, and ability to cope at home.

Health emergency
An emergency due to actual or imminent occurrence which endangers or threatens to endanger the safety and health of persons in the state of NSW and requires a significant and coordinated whole-of-health response. This particularly applies to human infectious disease emergencies from whatever cause.

Health services
Any medical, hospital, ambulance, paramedical, community health or environmental health service or any other service relating to the maintenance or improvement of the health, or restoration to health, of persons or the prevention of disease in or injury to persons.

Influenza
Influenza, commonly called 'the flu', is an illness caused by the influenza virus. The virus is passed from person to person mostly by a simple sneeze or cough. Influenza can lead to illnesses which are more severe than those caused by other respiratory viruses, such as the common cold.

Pandemic
A (severe) disease occurring throughout the world and affecting large numbers of people.

Surveillance
To detect, watch over, supervise or observe persons with a health condition.

WHO
World Health Organization

Performance Audits by the Audit Office of New South Wales

Performance Auditing

What are performance audits?

Performance audits determine whether an agency is carrying out its activities effectively, and doing so economically and efficiently and in compliance with all relevant laws.

Performance audits may review a government program, all or part of a government agency or consider particular issues which affect the whole public sector.

Where appropriate, performance audits make recommendations for improvements.

If you wish to find out what performance audits are currently in progress, visit our website at www.audit.nsw.gov.au.

Why do we conduct performance audits?

Performance audits provide independent assurance to Parliament and the public that government funds are being spent efficiently and effectively, and in accordance with the law.

Performance audits seek to improve the efficiency and effectiveness of government agencies so that the community receives value for money from government services.

Performance audits also assist the accountability process by holding managers to account for agency performance.

What are the phases in performance auditing?

Performance audits have three key phases: planning, fieldwork and report writing.

During the planning phase, the audit team will develop audit criteria and define the audit field work.

At the completion of field work we will meet with agency management to discuss all significant matters arising out of the audit. Following this, we will prepare a draft performance audit report.

We meet with agency management to check that facts presented in the report are accurate and that recommendations are practical and appropriate. Following this, a formal draft report is provided to the CEO for comment. The relevant Minister is also provided with a copy of the draft report. The final report, which is

tabled in Parliament, includes any comment made by the CEO on the conclusion and the recommendations of the audit.

Depending on the scope, performance audits can take several months to complete.

Copies of our performance audit reports can be obtained from our website or by contacting our Office.

How do we measure an agency's performance?

During the planning phase, the team develops the audit criteria. These are standards of performance against which the agency or program is assessed. Criteria may be based on best practice, government targets, benchmarks, or published guidelines.

Do we check to see if recommendations have been implemented?

Every few years we conduct a follow-up audit. These follow-up audits look at the extent to which action has been taken to address issues or recommendations agreed to in an earlier performance audit.

The Public Accounts Committee (PAC) may also conduct reviews or hold inquiries into matters raised in performance audit reports. Agencies are also requested to report actions taken against each recommendation in their annual report.

Who audits the auditors?

Our performance audits are subject to internal and external quality reviews against relevant Australian and international standards. This includes ongoing independent certification of our ISO 9001 quality management system.

The PAC is also responsible for overseeing the activities of the Audit Office and conducts a review of our operations every three years.

Who pays for performance audits?

No fee is charged for performance audits. Our performance audit services are funded by the NSW Parliament and from internal sources.

Further information

Further information can be obtained from our website www.audit.nsw.gov.au or by contacting us on 9275 7277.

Performance Audit Reports

No	Agency or Issues Examined	Title of Performance Audit Report or Publication	Date Tabled in Parliament or Published
79	TAFE NSW	*Review of Administration*	6 February 2001
80	Ambulance Service of New South Wales	*Readiness to Respond*	7 March 2001
81	Department of Housing	*Maintenance of Public Housing*	11 April 2001
82	Environment Protection Authority	*Controlling and Reducing Pollution from Industry*	18 April 2001
83	Department of Corrective Services	*NSW Correctional Industries*	13 June 2001
84	Follow-up of Performance Audits	*Police Response to Calls for Assistance The Levying and Collection of Land Tax Coordination of Bushfire Fighting Activities*	20 June 2001
85*	Internal Financial Reporting	*Internal Financial Reporting including a Better Practice Guide*	27 June 2001
86	Follow-up of Performance Audits	*The School Accountability and Improvement Model (May 1999) The Management of Court Waiting Times (September 1999)*	14 September 2001
87	E-government	*Use of the Internet and Related Technologies to Improve Public Sector Performance*	19 September 2001
88*	E-government	*e-ready, e-steady, e-government: e-government readiness assessment guide*	19 September 2001
89	Intellectual Property	*Management of Intellectual Property*	17 October 2001
90*	Intellectual Property	*Better Practice Guide Management of Intellectual Property*	17 October 2001
91	University of New South Wales	*Educational Testing Centre*	21 November 2001
92	Department of Urban Affairs and Planning	*Environmental Impact Assessment of Major Projects*	28 November 2001
93	Department of Information Technology and Management	*Government Property Register*	31 January 2002
94	State Debt Recovery Office	*Collecting Outstanding Fines and Penalties*	17 April 2002
95	Roads and Traffic Authority	*Managing Environmental Issues*	29 April 2002
96	NSW Agriculture	*Managing Animal Disease Emergencies*	8 May 2002
97	State Transit Authority Department of Transport	*Bus Maintenance and Bus Contracts*	29 May 2002
98	Risk Management	*Managing Risk in the NSW Public Sector*	19 June 2002
99	E-Government	*User-friendliness of Websites*	26 June 2002

No	Agency or Issues Examined	Title of Performance Audit Report or Publication	Date Tabled in Parliament or Published
100	NSW Police Department of Corrective Services	*Managing Sick Leave*	23 July 2002
101	Department of Land and Water Conservation	*Regulating the Clearing of Native Vegetation*	20 August 2002
102	E-government	*Electronic Procurement of Hospital Supplies*	25 September 2002
103	NSW Public Sector	*Outsourcing Information Technology*	23 October 2002
104	Ministry for the Arts Department of Community Services Department of Sport and Recreation	*Managing Grants*	4 December 2002
105	Department of Health Including Area Health Services and Hospitals	*Managing Hospital Waste*	10 December 2002
106	State Rail Authority	*CityRail Passenger Security*	12 February 2003
107	NSW Agriculture	*Implementing the Ovine Johne's Disease Program*	26 February 2003
108	Department of Sustainable Natural Resources Environment Protection Authority	*Protecting Our Rivers*	7 May 2003
109	Department of Education and Training	*Managing Teacher Performance*	14 May 2003
110	NSW Police	*The Police Assistance Line*	5 June 2003
111	E-Government	*Roads and Traffic Authority Delivering Services Online*	11 June 2003
112	State Rail Authority	*The Millennium Train Project*	17 June 2003
113	Sydney Water Corporation	*Northside Storage Tunnel Project*	24 July 2003
114	Ministry of Transport Premier's Department Department of Education and Training	*Freedom of Information*	28 August 2003
115	NSW Police NSW Roads and Traffic Authority	*Dealing with Unlicensed and Unregistered Driving*	4 September 2003
116	NSW Department of Health	*Waiting Times for Elective Surgery in Public Hospitals*	18 September 2003
117	Follow-up of Performance Audits	*Complaints and Review Processes (September 1999) Provision of Industry Assistance (December 1998)*	24 September 2003
118	Judging Performance from Annual Reports	*Review of Eight Agencies' Annual Reports*	1 October 2003
119	Asset Disposal	*Disposal of Sydney Harbour Foreshore Land*	26 November 2003

No	Agency or Issues Examined	Title of Performance Audit Report or Publication	Date Tabled in Parliament or Published
120	Follow-up of Performance Audits NSW Police	*Enforcement of Street Parking (1999) Staff Rostering, Tasking and Allocation (2000)*	10 December 2003
121	Department of Health NSW Ambulance Service	*Code Red: Hospital Emergency Departments*	15 December 2003
122	Follow-up of Performance Audit	*Controlling and Reducing Pollution from Industry (April 2001)*	12 May 2004
123	National Parks and Wildlife Service	*Managing Natural and Cultural Heritage in Parks and Reserves*	16 June 2004
124	Fleet Management	*Meeting Business Needs*	30 June 2004
125	Department of Health NSW Ambulance Service	*Transporting and Treating Emergency Patients*	28 July 2004
126	Department of Education and Training	*School Annual Reports*	15 September 2004
127	Department of Ageing, Disability and Home Care	*Home Care Service*	13 October 2004
128*	Department of Commerce	*Shared Corporate Services: Realising the Benefit including guidance on better practice*	3 November 2004
129	Follow-up of Performance Audit	*Environmental Impact Assessment of Major Projects (2001)*	1 February 2005
130*	Fraud Control	*Current Progress and Future Directions including guidance on better practice*	9 February 2005
131	Follow-up of Performance Audit Department of Housing	*Maintenance of Public Housing (2001)*	2 March 2005
132	Follow-up of Performance Audit State Debt Recovery Office	*Collecting Outstanding Fines and Penalties (2002)*	17 March 2005
133	Follow-up of Performance Audit Premier's Department	*Management of Intellectual Property (2001)*	30 March 2005
134	Department of Environment and Conservation	*Managing Air Quality*	6 April 2005
135	Department of Infrastructure, Planning and Natural Resources Sydney Water Corporation Sydney Catchment Authority	*Planning for Sydney's Water Needs*	4 May 2005
136	Department of Health	*Emergency Mental Health Services*	26 May 2005
137	Department of Community Services	*Helpline*	1 June 2005
138	Follow-up of Performance Audit State Transit Authority Ministry of Transport	*Bus Maintenance and Bus Contracts (2002)*	14 June 2005
139	RailCorp NSW	*Coping with Disruptions to CityRail Passenger Services*	22 June 2005
140	State Rescue Board of New South Wales	*Coordination of Rescue Services*	20 July 2005

No	Agency or Issues Examined	Title of Performance Audit Report or Publication	Date Tabled in Parliament or Published
141	State Budget	*In-year Monitoring of the State Budget*	28 July 2005
142	Department of Juvenile Justice	*Managing and Measuring Success*	14 September 2005
143	Asset Management	*Implementing Asset Management Reforms*	12 October 2005
144	NSW Treasury	*Oversight of State Owned Electricity Corporations*	19 October 2005
145	Follow-up of 2002 Performance Audit	*Purchasing Hospital Supplies*	23 November 2005
146	Bus Transitways	*Liverpool to Parramatta Bus Transitway*	5 December 2005
147	Premier's Department	*Relocating Agencies to Regional Areas*	14 December 2005
148	Department of Education and Training	*The New Schools Privately Financed Project*	8 March 2006
149	Agency Collaboration	*Agencies Working Together to Improve Services*	22 March 2006
150	Follow-up of 2000 Performance Audit	*Fare Evasion on Public Transport*	26 April 2006
151	Department of Corrective Services	*Prisoner Rehabilitation*	24 May 2006
152	Roads and Traffic Authority	*The Cross City Tunnel Project*	31 May 2006
153	Performance Information	*Agency Use of Performance Information to Manage Services*	21 June 2006
154	Follow-up of 2002 Performance Audit	*Managing Sick Leave in NSW Police and the Department of Corrective Services*	June 2006
155	Follow-up of 2002 Performance Audit	*Regulating the Clearing of Native Vegetation*	19 July 2006
156*	Fraud Control	*Fraud Control Improvement Kit: Meeting Your Fraud Control Obligations*	20 July 2006
157	Roads and Traffic Authority	*Condition of State Roads*	16 August 2006
158	Department of Education and Training	*Educating Primary School Students with Disabilities*	6 September 2006
159	NSW Health	*Major Infectious Disease Outbreaks: Readiness to Respond*	November 2006

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