Simulation exercises on influenza pandemic responses in the Asia-Pacific region

The presence of the highly pathogenic avian influenza H5N1 virus has been confirmed in more than 60 countries around the globe over the past three years. The virus continues to spread among birds in many parts of the world, causing sporadic cases of human infection, and posing the threat of a global influenza pandemic. The Asia-Pacific region, where the virus first emerged, faces the highest risk of becoming an epicentre for the emergence of a pandemic strain.

Here, national governments have developed pandemic preparedness and response plans, and many have tested their plans through simulation exercises. Simulation exercises are a crucial component of the pandemic response planning process. Many different types of simulation exercise have taken place across the region, with various objectives and stakeholders.

This publication is a compendium of the simulation exercises that have been used to test pandemic preparedness and response plans in different countries and by various organizations in the Asia-Pacific region. Whether you are working in central or local government, international or regional organizations, the nongovernmental or private sector, the experiences gathered here will no doubt help you prepare for the next pandemic.
Simulation exercises on \textit{influenza pandemic responses} in the Asia-Pacific region
Foreword

The H5N1 highly pathogenic avian influenza virus has been confirmed in more than 60 countries during the past three years. The virus is capable of infecting and causing severe illness in humans, with more than 350 sporadic cases reported (over 240 have died). Governments have become increasingly alert to the possibility that this virus could undergo genetic change and become capable of sustained transmission between humans, triggering an influenza pandemic.

A severe influenza pandemic would have significant consequences for the whole of society. The world experienced three pandemics in the 20th century, one of which (1918–19) resulted in widespread loss of life and had serious economic and social impacts. History suggests that there will be another influenza pandemic at some time in the future; its impact could be greatly reduced by preparing to ensure continuity of essential services, governance, economic activity, transportation and health care. The alternative – as with any crisis – is that vulnerable people suffer unnecessarily.

Prompted by concerns resulting from the spread of avian influenza, almost all the world’s nations have now developed national pandemic preparedness plans. The nature and scope of these plans varies: while most address medical and public health responses, many do not yet indicate how essential services will continue to operate under pandemic conditions, nor do they prepare sufficiently for a pandemic’s economic, humanitarian and societal consequences.

The United Nations system advocates multisectoral pandemic preparedness at local, provincial and national levels with the involvement of government, civil society, private entities and the media. In our experience, the testing of pandemic preparation – through simulation exercises – is the most effective and efficient way to validate assumptions, examine capacity and ensure an optimal state of readiness.

Many national governments within the Asia-Pacific region have initiated actions to prepare for the next influenza pandemic. They are making provisions to ensure that they can contain it at source and respond to exceptional needs. They need to ensure that essential services will continue to operate under conditions of high absenteeism, diminished supply lines and altered demand. These governments have built considerable experience with simulation exercises.

I am delighted that representatives from countries in the Association of Southeast Asian Nations (ASEAN) Plus Three group were able to share their experiences of simulating responses to an influenza pandemic in November 2007 in Bangkok, Thailand. I am grateful to them for teaming up with the Asian Disaster Preparedness Center, the Kenan Institute Asia and the Asia-Pacific hub of the United Nations System Influenza Coordination to document their experiences.

I am also grateful to the representatives from Australia, Fiji, New Zealand, Niue and key regional and international organizations who joined this endeavour.

So it gives me great pleasure to present you with this compendium of simulation exercises that have been used to test pandemic preparedness. Whether you are working in central or local government, international or regional organizations, or the nongovernmental or private
sector, my colleagues and I hope these experiences will help you as you prepare for the next pandemic.

I take this opportunity to thank the many dedicated people who worked so hard on the production of this booklet. They would be delighted both to receive your feedback on what is written here and to hear of your progress with pandemic simulation.

David Nabarro
Senior United Nations System Influenza Coordinator
Acknowledgements

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Introduction

Highly pathogenic avian influenza type A H5N1 continues to spread among birds in many parts of the world, causing sporadic human cases of H5N1 infection, and posing the potential threat of a global influenza pandemic. If the H5N1 virus mutates or reassorts in a way that makes it capable of sustained transmission between humans, it could result in a pandemic with devastating impacts. In response to this threat, many countries have taken forward preparations to avert and mitigate the impact of an influenza pandemic. According to a United Nations System Influenza Coordination (UNSIC)–World Bank report, 112 out of 118 countries surveyed (95%) reported that they have made some effort in pandemic preparedness, and 41% indicated that their pandemic plans have been tested through simulation exercises. The Asia-Pacific region, where the virus first emerged, faces the highest risk of becoming an epicentre for the emergence of a pandemic strain. Here, almost all countries have developed pandemic preparedness and response plans, and many have tested their plans through simulation exercises.

The value of simulation exercises has been recognized as a crucial component of a pandemic response planning process. As Section II illustrates, many different types of simulation exercise have taken place, with different objectives and different stakeholders. This section provides a brief discussion on the rationale for conducting simulation exercises, different types of exercises that may be pursued, and factors that may influence the selection of types of simulation exercises.

Why do we do exercises?

Any plan requiring coordinated action by a number of stakeholders, which has not been validated through a process of practice, or ‘simulation exercise’, is simply a collection of ideas and concepts waiting for translation into action. There are three main reasons for conducting simulation exercises that are also applicable to many different types of contingency, disaster, emergency or crisis planning activities:

1. To verify the effectiveness of the entire (or components of) plans: Where plans are developed for previously unexperienced events, planners, managers and those responsible for the constituents need to be sure that the plans developed will work. The effectiveness of planned activities, such as command and control, communications, technology and agreements, needs to be verified. Where exercises show the need for improvement, these areas should be addressed and exercises repeated to allow confidence amongst those responsible. From time to time, staff, technology and other components of potential responses are modified. When this occurs exercises are needed to verify the effectiveness of the modifications.

2. To provide experience and practice to those who may be involved in a response: Exercising is a valuable way of putting into practice response plans prior to an actual need. Exercises allow people identified in the plans to perform their functions in a lower stress environment. This gives them opportunity to explore their roles and the expectations of response plans. Within the exercise format, staff and managers have the opportunity to identify and correct knowledge gaps and functional inconsistencies. This can lead to targeted training or improvements in the planning process after the exercise.

3. To raise awareness among and provide assurance to stakeholders on the preparedness plan:
Particularly where an event may result in significant numbers of deaths or injuries, or large loss of assets and equipment, there is often an expectation that governments, departments and large organizations should have in place plans and preparations capable of minimizing such loss and damage, and ensuring a rapid return to normality. Communication and witnessing of exercises is a good way to inform all stakeholders of the existence of plans, and what they may be required to do during major events.

What exercise options are there?
There are several different types of simulation exercise, each of which has numerous benefits and weaknesses. While different names and definitions are used by different groups, this booklet lists below five types referred to in the World Health Organization (WHO) guides:

**Orientation**
An orientation takes the form of an informal discussion designed to familiarize participants with plans, roles and procedures with a focus on questions of coordination and assignment of responsibilities. Typically the orientation is conducted by the author(s) of the plan with the assistance of a capable note-taker who keeps track of the discussions, identified plan weaknesses and suggestions for improvement. Of the five types of exercise, an orientation is the simplest and costs the least. It should be considered the absolute minimum requirement for validating a plan or sections of a plan under development.

**Drill**
A drill is used to develop and maintain skills in a single response procedure, such as alerting and notification, passage of critical information, activation of emergency resources and practice of specialized emergency skills that constitute one or more components of an emergency plan and procedure. Drills are limited in scope and should have a procedural focus to train and support specific skills and interactions as part of a larger organizational response.

**Table-top exercise (TTX)**
The TTX is normally a discussion held around a conference or round table over the space of 2 or 3 hours, thus ensuring the low cost of the exercise and likely involvement of more individuals. Development and delivery of the scenario can normally be provided by just 1 or 2 people. The conference room atmosphere can also create a light-hearted and non-threatening environment where individuals do not feel they are being tested or examined. A TTX can also be very flexible and have multiple options designed for the facilitators’ use. It usually gathers together officials

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and/or key staff with emergency management responsibilities, without tight time constraints, to examine and discuss simulated emergency situations and attempt to resolve problems based on their emergency plans. It is sometimes referred to as a ‘desk-top’, which is somewhat misleading, since the convention with a TTX is to pull people away from their desks and assemble them around a common table. Often, the simulation contains elements of ambiguity to encourage creativity in the application of the emergency plan. The success of the exercise is largely determined by group participation in the identification of problem areas.

Of the five types of exercises listed here, the TTX is the workhorse, ranging in scope and complexity from the simplicity of the orientation to nearly the complexity of a functional exercise (see below). Equipment and resources are not deployed and time pressures are not introduced. The exercise is guided by a simulated series of events that require some subject matter expertise to prepare. While many TTXs require relatively little planning and coordination, a large-scale and rigorous TTX requires dedicated planning resources, skilled facilitation and trained evaluators to be most effective. The obvious limitation of the TTX is that the scenario experienced by the participants will not be in any way ‘real life’ or involve tests of technical components such as information technology (IT) systems, equipment or communications protocols. Many participants may also consider that the scenario is not ‘realistic’ and therefore not treat the TTX seriously. A TTX may be used where a plan is already documented, and can also be used to examine expected results or baseline weaknesses where no plan currently exists. Assessments are typically conducted on the spot and by the facilitator.

**Functional exercise**

A functional exercise involves creating a situation and facilitating a ‘real’ response, and may include such activities as activating command centres, documenting actions and decisions, completing real forms, issuing real communications and responding to simulated media or other questions. It is different from a TTX in three ways. First, it is interactive, requiring participants to respond to each other in the roles designated for them in the plan. Second, it is conducted under time constraints that would be similar to, or often more challenging than, a real event. Finally, it is usually conducted in the facility designated for coordination/management of a real event, so the available tools and technologies can be used and evaluated. Functional exercises are fully simulated at significant levels of detail, usually covering multiple functions and designed to validate policies, roles and responsibilities, capabilities and procedures of single or multiple emergency management functions or agencies. The design, conduct and evaluation of a functional exercise require considerable resources to ensure maximum benefit.

**Full-scale exercise**

Where a functional exercise concentrates on the policy and interactive elements of the management of an emergency, a full-scale exercise focuses on the operational capability of emergency response and management systems. Typically, this will include actual deployment of the resources required to demonstrate coordination and response capabilities in as realistic a setting as possible without putting the safety of the public and staff at risk. Properly executed full-scale exercises require more resources for planning, conduct and evaluation than a functional exercise, plus the added staffing, operational and insurance costs of mobilizing emergency resources in real time.

Requirements for different exercises are summarized in Figure 1.
What is the basis for selecting exercise types?

Each of the exercises listed above has strengths and weaknesses that need to be well understood when the type of exercise is selected. Key factors that need to be considered include:

**Objectives of the exercise**: The most crucial thing for exercise managers to determine is ‘what needs to be tested’. If the intent is to test the feasibility and applicability of a predetermined policy and decision-making process, a TTX will be the most cost-effective choice. If it is intended to test specific skills, a drill would probably be the best choice. If the exercise is also intended to be used as an advocacy tool, a large-scale, functional or full-scale exercise would be most appropriate to address the objectives.

**Time for preparation**: The exercise will inevitably require more time to prepare as the number of participants increases, the scope of the exercise becomes wider, and the duration of the exercise becomes longer. Unless sufficient time can be allocated for preparation, smaller and simpler exercises, such as TTX, are highly recommended.

**Resources availability**: The larger the scale and more complex the exercise, the more it will cost. While the type and design of the exercise should be considered against the available budget, if the exercise is intended to test the details of the plan, a well-designed, tailor-made full-scale exercise is worth trying, if sufficient budget is available.

The strengths and weaknesses of different types of simulation exercise are summarized in Table 1.

### Conclusion

This section introduced five different types of simulation exercise with respective strengths and weaknesses. The most crucial thing that exercise managers need to address is ‘what needs to be tested’ through simulation exercises. For more practical guidance on running simulation

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**Table 1**

<table>
<thead>
<tr>
<th>Type</th>
<th>Planning and training required</th>
<th>Capabilities required</th>
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<tbody>
<tr>
<td>Orientation</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Table-top exercise</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Drill</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Functional exercise</td>
<td>High</td>
<td>Moderate</td>
</tr>
<tr>
<td>Full-scale exercise</td>
<td>High</td>
<td>High</td>
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</tbody>
</table>

Source: Adapted from the Homeland Security Exercise and Evaluation Program (HSEEP), United States Department of Homeland Security.\(^4\)

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exercises, various WHO guides are available.\textsuperscript{2,3} The following section will review a number of pandemic simulation exercises that have been conducted in different countries and by various organizations in the Asia-Pacific region.

<table>
<thead>
<tr>
<th>Exercise type</th>
<th>Cost</th>
<th>Planning time</th>
<th>Policy</th>
<th>Plan</th>
<th>Procedure</th>
<th>Tactic</th>
<th>Skill</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orientation</td>
<td>$</td>
<td>2 weeks to 2 months</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Drill</td>
<td>$$</td>
<td>1 to 3 months</td>
<td>N/A</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Table-top exercise</td>
<td>$</td>
<td>2 to 6 months</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Functional exercise</td>
<td>$$$ to $$$$$</td>
<td>2 to 12 months</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Full-scale exercise</td>
<td>$$$$$+</td>
<td>3 to 12 months</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

N/A: not applicable

Source: Adapted from a slide presented by the United States Department of Health and Human Services at the Asia-Pacific Economic Cooperation (APEC) Health Task Force Seminar on Assessing Pandemic Preparedness, 16–17 August 2006, Singapore.\textsuperscript{5}

Part II
National and regional exercises
1. Background

Australia has well-established plans for responding to an influenza pandemic, as set out in the Australian Health Management Plan for Pandemic Influenza (AHMPPI), last released in May 2006, and the National Action Plan for a Human Influenza Pandemic (NAP), released in July 2006.

The AHMPPI outlines the Australian health sector strategy for responding to an influenza pandemic as well as documenting measures key stakeholder groups, organizations, the community and individuals can take to prepare for a pandemic. The AHMPPI provides the health foundations for the NAP, which links the health plan with other government plans at national, state and territory level. The AHMPPI also provides the overarching framework for operational-level health response plans at state and territory level.

As one measure to enhance pandemic preparedness, in 2006 Australia’s national government worked with state and territory governments to conduct a national pandemic exercise, Exercise Cumpston 06, which culminated in a four-day live simulation exercise on 16–19 October 2006.

2. Objectives

The aim of Exercise Cumpston 06 was to exercise and validate the capacity and capability of the Australian health system to prevent, detect and respond to a pandemic in accordance with the AHMPPI and allow any gaps to be identified and addressed. It also exercised governance aspects of the NAP and state and territory plans. More specifically, the objectives of the exercise were to assess:

1. cross-portfolio and cross-jurisdictional decision-making;
2. pandemic preparedness planning and coordination arrangements within and between jurisdictions;
3. public communications strategies;
4. pandemic influenza surveillance arrangements;
5. public health measures;
6. health-care emergency response arrangements.

3. Participating agencies and organizations

<table>
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<tr>
<td><strong>Australian Government</strong></td>
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<tr>
<td>Air Services Australia</td>
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<td>Australian Customs Service</td>
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<tr>
<td>Australian Federal Police</td>
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<tr>
<td>Australian Quarantine and Inspection Service</td>
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<tr>
<td>Department of Prime Minister and Cabinet</td>
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<tr>
<td>Department of Foreign Affairs and Trade</td>
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<tr>
<td>Attorney-General’s Department</td>
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<tr>
<td>Department of Immigration and Multicultural Affairs</td>
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<tr>
<td>Department of Industry, Tourism and Resources</td>
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<tr>
<td>Department of Defence</td>
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<tr>
<td>Department of Families, Community Services and Indigenous Affairs</td>
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<tr>
<td><strong>State and territory governments</strong></td>
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<tr>
<td>First ministers’ departments</td>
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<tr>
<td>Health departments</td>
</tr>
<tr>
<td>Emergency management departments or organizations</td>
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<td>Other departments at the discretion of the state/territory governments</td>
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<tr>
<td><strong>Nongovernmental organizations</strong></td>
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<tr>
<td>Australian Divisions of General Practice</td>
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<tr>
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<td>Australian Red Cross</td>
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<td><strong>Industry</strong></td>
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<tr>
<td>Brisbane Airport Corporation</td>
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<td>Qantas</td>
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4. Type of exercise
Full-scale exercise.

5. Preparation for the exercise
A task force was established in the Department of Health and Ageing, with dedicated staff and resourcing, to develop and conduct the exercise. The task force was overseen by a steering group, comprising senior representatives of key government agencies at national, state and territory level, and a management group within the department.

A series of seven preliminary activities was conducted between April and August 2006 in the lead-up to the main exercise in October, which were intended to:
- engage a broader group than would directly participate in the main activity;
- provide an opportunity for those participating in the main activity to focus on the capacities and capabilities they would exercise;
- provide information to develop the scenario for the main activity;
- assist in refining the evaluation strategy;
- identify and address gaps in preparedness or policy issues prior to the main activity.

These preliminary activities included:
- a drill to exercise processes involved in activating the National Medical Stockpile and deploying assets – 19 May 2006;
- a two-day workshop on crisis communications – 6–7 June 2006;
- two discussion exercises on border control, including the screening of incoming passengers – 19 April and 22 June 2006;
- a discussion exercise on intragovernmental and intergovernmental decision-making and coordination – 16 June 2006;

6. Conduct of the exercise
The main activity of Exercise Cumpston 06 was conducted from 16 to 19 October 2006. In designing the main activity care was taken to create a realistic scenario that would prompt appropriate responses by participants. This involved simulation of the international emergence and progression of the pandemic using sound epidemiological data and realistic assumptions.

Two fictitious countries, Acamar and Bellatrix, were created to establish the origin of the disease. Detailed geographical, demographic, economic and health system profiles were developed for these countries and made available to participants via country ‘fact books’ and the exercise web site. This enabled consideration of the development of the pandemic outside Australia without compromising international relationships.

The main activity involved a three-level simulation of an outbreak of pandemic influenza at the national political level, involving Commonwealth agencies and all states and territories. The simulation was supported by five live drills in Queensland, including at Brisbane International Airport, Royal Brisbane and Women’s Hospital, a general medical practice, a simulated influenza assessment centre and a laboratory. While designed and conducted as part of the scenario for the main activity, the primary purpose of the drills was to validate particular operational procedures.

The main activity was managed by the Exercise Chief Controller, supported by the Exercise Control Team comprising national and jurisdictional facilitators and controllers. The team worked from the national Exercise Control room located within the Department of Health and Ageing in Canberra. It included personnel from relevant Commonwealth agencies and each state and territory. Their responsibilities included coordination, communication, documentation and media management.

The Exercise Control Team communicated with facilitators and evaluators, monitored progress, determined when corrective action (such as new exercise inputs) was required and provided the materials to enable facilitators to bring the exercise back on track when necessary. A separate Exercise Control was established in Brisbane to manage the Queensland components of the main activity.

Around 800 participants performed their expected response roles as the scenario unfolded. The scenario started with an outbreak in the imaginary South-East Asian country of Acamar. The virus spread first throughout Acamar, then on to neighbouring countries and
finally across the Pacific. It simulated the conditions necessary for the triggering of WHO Pandemic Alert Phase 3, 4 and 5 – human infection with H5N1 avian influenza with possible person-to-person transmission – and eventually Phase 6 – a global influenza pandemic.

The master events list (MEL) was developed based on the scenario and described timings of events and associated exercise inputs. The MEL was constructed and controlled through a Microsoft Access database designed by the Pandemic Influenza Exercise Task Force. The database, which contained over 1000 entries, facilitated event time management and manipulation of scenario data, providing national Exercise Control with the ability to easily extract subsets of information in a variety of formats.

In addition to the Exercise Control Team and participants, exercise facilitators and role players played the roles listed below throughout the exercise.

Exercise facilitators:
- provide exercise inputs
- monitor the progress of the exercise
- ensure actions expected from the exercise inputs are completed
- solve problems in the conduct of the exercise.

Role players:
Role players were engaged to help create realism in certain situations, e.g. by presenting as patients to an assessment centre or by phoning exercise participants about scripted exercise issues.

To simulate media scrutiny of Exercise Cumpston 06, a team of pseudo journalists was also assembled in order to test media managers throughout the exercise via a series of media questions and requests for information.

National pseudo media conferences were staged on each day of the exercise with Australia’s Chief Medical Officer.

Exercise observers:
An Exercise Observer Programme was established to enable key national and international agencies to share the Exercise Cumpston 06 experience. Representatives from 55 organizations, including the United Nations, WHO and Asia-Pacific Economic Cooperation, as well as academia and national nongovernmental organizations, participated as observers.

7. Evaluation
Around 70 exercise evaluators were deployed to observe exercise role players, note actions taken against expected actions, assess the performance of systems and personnel, and prepare a report on exercise play in their location, which contributed to the publication of the After Action Report.8

8. Lessons learnt

8.1 Preparation for and conduct of the exercise
The Exercise Cumpston 06 experience highlighted the importance of:
- allowing sufficient development time (12 months minimum recommended);
- involving subject matter experts, such as epidemiologists and medical officers, at an early stage;
- ensuring representation from all levels of government in the planning and conduct of the exercise;
- balancing the number of preliminary activities that identify new policy issues with the work required to develop a firm position on new and existing policy issues;
- considering the Exercise Cumpston 06 exercise control structure as a model;
- structuring observer programmes to give participants the opportunity to directly observe or be briefed on all exercise activities.

8.2 Pandemic preparedness
Exercise Cumpston 06 identified the following 12 key recommendations to strengthen Australia’s preparation for the health response to an influenza pandemic:
- Recommendation 1: Usual decision-making structures and consultative processes need to be streamlined to ensure timely responses in an emergency.

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Part II: National and regional exercises

Thermal camera scans incoming air passengers during Exercise Cumpston 06.

- Recommendation 2: National pandemic plans (the AHMPPI, the NAP and other relevant plans) need updating to provide for a more flexible layering of preparedness and response measures according to the severity of the pandemic and available response capacity.
- Recommendation 3: Health electronic communications systems, including the Health Alert Network and the Department of Health and Ageing web site, need to be further developed and exercised.
- Recommendation 4: There is an urgent need for improved whole-of-government and cross-jurisdictional communications mechanisms to ensure consistent and coordinated delivery of public messages.
- Recommendation 5: The concept and operation of public health policies, such as social distancing, need to be explained to the public with public communication messages and strategies prepared ahead of time.
- Recommendation 6: A nationally agreed framework for pandemic influenza surveillance should form an annex to the AHMPPI, and should be underpinned by operational plans and improved information and communications technology.
- Recommendation 7: Individual jurisdictions should ensure operational lessons learnt from exercise activities are shared with all state and territory health departments and other relevant groups.
- Recommendation 8: Further clarification of Commonwealth quarantine and state and territory public health and health emergency legislation is needed to ensure smooth operational interaction. This will include detailed operational procedures for triggering and applying the relevant powers.
- Recommendation 9: The AHMPPI needs further updating and fleshing out in some policy areas to ensure nationally consistent and streamlined approaches to, for example, border quarantine, social distancing, access to antivirals and vaccines and influenza assessment centres.
- Recommendation 10: General practitioners, community pharmacies and other primary care providers need to be better integrated into detailed plans at the national and jurisdictional level.
- Recommendation 11: Procedures for health incident rooms and operations centres need to be reviewed to ensure that seamless support for decision-making and experience of command, control and coordination in emergencies are built in.
- Recommendation 12: The exercise did not test Australia’s whole-of-government capacity to respond over an extended period. Further work is needed to ensure responses can be sustained over a prolonged period through planning for workforce training and surge capacity, scenario-based contingency planning and a continuing programme of pandemic preparedness exercises.
1. Background
Brunei Darussalam held two drills, Serama 1 and Serama 2, in March 2005 and April 2006 respectively. The scenario in Serama 1 involved an outbreak of avian influenza among poultry in a farm. The scenario in Serama 2 was similar but included the addition of human infection with avian influenza. Both drills involved up to 250 personnel from various governmental agencies, including the Department of Agriculture, the Ministry of Health and the Royal Brunei Armed Forces.

One of the lessons learnt was that the plans and coordination of all agencies needed to be synchronized. This was especially important in a pandemic situation. As a result the National Committee for Pandemic Influenza Preparedness was established in 2006. The National Committee is chaired by the Crown Prince, who is also the Senior Minister at the Prime Minister's Office, and membership comprises cabinet ministers and high-ranking officials of all ministries within His Majesty’s Government of Brunei Darussalam. In addition, all ministries and relevant agencies within His Majesty’s Government of Brunei Darussalam have their own focal point for pandemic influenza preparedness and their own pandemic influenza preparedness plan. These plans have been reviewed and consolidated into the National Pandemic Influenza Preparedness Plan.

With the formation of the National Committee for Pandemic Influenza Preparedness, the Ministry of Health’s Pandemic Influenza Preparedness Committee decided to review its pandemic influenza plans in 2006. This led to two TTXs being conducted in the same year on 6 June and 5 September.

2. Objectives
The objective of the TTXs was to constructively examine, discuss and resolve issues based on existing operational plans, identify where those plans need to be refined and make appropriate adjustments as necessary.

3. Participating agencies and organizations
Participants included the following:
- the seven subcommittees of the Pandemic Influenza Preparedness Committee of the Ministry of Health;
- focal points for Pandemic Influenza Preparedness from other ministries within His Majesty’s Government of Brunei Darussalam.

Participation was on an invitation basis, with the focus being on directors/heads of departments and divisions.

4. Type of exercise
TTX.

5. Preparation for the exercise
The exercise management team comprised approximately 30 people working part-time for one month in the lead-up to the exercise. The team was cross-departmental to ensure information from all relevant agencies was available. The exercise planning team members were assigned tasks on facilitation, development/design, logistics/support, public relations/media and documentation.

One of the lessons learnt was that the plans and coordination of all agencies needed to be synchronized.

The use of external facilitators was considered, but could not be implemented because of time constraints.

The organization team developed very detailed preparations and plans, including logistics, documentation and the scenario information. The planning team had six formal meetings in the build-up to the exercise to formulate plans and monitor developments. A large quantity of pre-prepared documents was used during the exercises, as well as IT and logistical supplies.
6. Conduct of the exercise
The exercises took place in the Ministry of Health building. Participants were divided into eight groups (seven subcommittees and one main executive committee).

The first TTX focused on surveillance, rapid response and containment on a time-line moving from Phase 3 to Phase 4 of WHO’s phases of pandemic alert. The second TTX focused on communications, logistics and antiviral and vaccine provision on a time-line moving from Phase 4 to Phase 5. The exercises lasted for two days each, the scenario being conducted on the first day and evaluated on the second.

The scenario was set in a specific geographical location in Brunei Darussalam and actual demographic data were used because organizers felt it would help participants connect with the scenario.

The scenario was explored by:
• briefing the participants on protocols for interaction and participation;
• using audiovisual materials and handouts;
• discussion of the scenario among participants before commencement (30 minutes);
• presentation of problem statements and simulated messages to participants during the exercise;
• general discussion of the outcomes after the exercise.

7. Evaluation
At the conclusion of the exercise a high-level briefing was given to the Minister, Deputy Minister, Permanent Secretary and the Executive Committee of the Pandemic Influenza Preparedness Committee of the Ministry of Health. A separate briefing on the outcomes of the TTX was also presented to the National Pandemic Influenza Preparedness Committee.

8. Lessons learnt
A number of lessons were learnt in conducting the exercise:
• By ensuring cross-departmental activity the exercise provided a valuable opportunity for key pandemic respondents to network and learn about the role of other agencies.
• As many participants had not participated in exercises before, they had limited understanding of the concept of a ‘scenario’ or what to expect. The exercise management team provided fake scenarios ahead of the real scenario to build familiarity and comfort levels.

Brunei Darussalam is planning an interministry TTX to test the national plan in 2008. It is expected that the National Disaster Management Centre (NDMC) will run the exercise, rather than the Ministry of Health, as it will test WHO Phases 5–6 and the NDMC would be the lead agency in that scenario.

A functional exercise only is planned for the Ministry of Health, probably focusing on logistics, because that is an area identified for development.
1. **Background**

The rapid containment (RC) strategy aims to stop, or at least slow, the spread of pandemic influenza at the source of its emergence to minimize global morbidity and mortality. Containing the spread of a virus likely to produce a pandemic is an activity that has never been tested before. It is distinct from rapid response to outbreaks of human infection with avian influenza, as well as efforts to mitigate the impact of a fully evolved pandemic virus in a community. Recent studies based on mathematical modelling suggest that rapid interventions including mass prophylactic administration of antiviral drugs might contain an emerging pandemic virus or at least delay its international spread.

RC builds upon traditional public health practices that are used to detect, investigate and control clusters of human infection with avian influenza. However, containment of a large-scale outbreak is expected to take these efforts to unprecedented levels and require extensive international coordination and cooperation. The success of these interventions in forestalling the start of a pandemic or delaying its spread cannot be guaranteed. Nonetheless, the RC strategy represents one of the few preventive options available. Deployment of a containment operation requires extraordinary advance planning to strengthen fundamental capacities within countries. The process can be adapted and used to address other emerging infectious diseases.

For this endeavour, the Association of Southeast Asian Nations (ASEAN) has stockpiled 500,000 courses of antivirals and 700,000 sets of personal protective equipment (PPE) in a warehouse in Singapore with the support of the Government of Japan, and is developing and refining operational strategy to put RC into place at a regional as well as country level with the technical support of WHO.

As a part of this process, the ASEAN Secretariat, The Royal Government of Cambodia, WHO (Headquarters, Regional Office for the Western Pacific and Country Office in Cambodia), the Government of Japan and selected logistics companies jointly conducted a simulation exercise called *PanStop 2007* on 2–3 April 2007 to practise and evaluate the ability of various partners to work together in an RC operation.

2. **Objectives**

*PanStop 2007* was conceived to evaluate the decision-making, communications and logistical elements of an evolving RC and control strategy to suppress an outbreak of a novel strain of H5N1 avian influenza. This strategy is specifically a response to an influenza virus that demonstrates pandemic potential through efficient person-to-person transmission.

The exercise had three purposes: first, to test the ability of the principals involved in the protocol to make the required decisions and effect the necessary communication with partner agencies to launch and manage a containment operation; second, to train staff in the operation of the protocol; and third, to develop a replicable model exercise that could be made available to other jurisdictions for training purposes.

The purpose was to evaluate not the viability of the containment strategy itself, but the capability of the principals to launch and manage it. In the absence of an actual outbreak to contain, evaluation of the efficacy of containment presents significant operational and ethical challenges.
3. Participating agencies and organizations

<table>
<thead>
<tr>
<th>Agencies and organizations</th>
<th>Role</th>
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<tbody>
<tr>
<td>ASEAN Secretariat</td>
<td>Participating as the policy-level authority for releasing stockpiled materials</td>
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<tr>
<td>Japanese International Cooperation System (JICS)</td>
<td>Participating as the operational authority to direct the movement of the released materials</td>
</tr>
<tr>
<td>Singapore Technologies Logistics (STL)</td>
<td>Participating as the contracted agent to arrange delivery of the released materials</td>
</tr>
<tr>
<td>The Ministry of Health of the Royal Government of Cambodia and the Cambodian National Committee for Disaster Management</td>
<td>Participating as the host country with responsibility for initiating and supporting, at the national level, a containment operation in an affected area</td>
</tr>
<tr>
<td>WHO Country Office in Cambodia</td>
<td>Participating as a support agency to the Cambodian Ministry of Health and National Committee for Disaster Management</td>
</tr>
<tr>
<td>WHO Regional Office for the Western Pacific</td>
<td>Participating as the support and coordinating agency between the country and regionally held resources</td>
</tr>
<tr>
<td>WHO Headquarters</td>
<td>Participating in simulation of the central policy and global coordination role</td>
</tr>
<tr>
<td>Government of Japan, Ministry of Foreign Affairs</td>
<td>Participating as a donor agency</td>
</tr>
</tbody>
</table>

In addition, other ASEAN member country representatives observed the exercise at WHO Regional Office for the Western Pacific and WHO Country Office in Cambodia.

4. Type of exercise

The type of exercise selected was a modified form of a functional exercise, wherein participants perform the exercise processes from the locations that would be assigned to them during a real event, or from similar locations. Normally a functional exercise is conducted as close to real time as possible; however, a communicable disease outbreak is a slow-moving event, so the exercise model required modification to create an artificial compression of exercise time such that one hour equalled nearly one-and-a-half days in real time.

5. Preparation for the exercise

An exercise control and simulation team, with expertise in public health, virology, epidemiology and emergency management, was created at WHO Regional Office for the Western Pacific and tasked to develop and refine scenarios and a master events list (MEL), and articulate and run exercise and documentation processes. A preparatory meeting was held in Japan on 26 January 2007, followed by a pre-exercise meeting on 8–9 March 2007 in Bangkok to develop consensus on the scope, objectives and plan for PanStop 2007 among participating agencies and countries.

6. Conduct of the exercise

PanStop 2007 lasted for 11 hours over a one-and-a-half-day period and was conducted in six venues – WHO Regional Office for the Western Pacific in Manila, WHO Cambodia Country Office, JICS and the Japanese Ministry of Foreign Affairs (both in Tokyo), the ASEAN Secretariat in Jakarta and the offices of STL in Singapore.

The exercise scenario involved the simulated discovery of cases of avian influenza in a village among people who had no contact with infected birds but who did have contact with people who were infected with avian influenza from infected poultry. Later, the disease was found to have been transmitted, a second time, by those once and twice removed from the primary poultry infection, thus providing evidence of sustained human-to-human transmission and providing the basis for practising and testing the processes involved in mounting an RC operation.

As in all exercises, the events in the MEL were fed by exercise controllers and simulators to the participants as exercise messages by e-mail, telephone or fax. Participants then handled the information in the messages in much the same way as they would in a non-exercise situation, by analysing and clarifying information, consulting and conferring with colleagues, and making and simulating the implementation of decisions. Over the course of the exercise the participants were presented with 31 of 32 intended injects (one was deemed superfluous). Additional ad hoc messages were used...
to enhance context and stimulate exercise play when necessary. The scenario and injects solicited hundreds of e-mails and several telephone and conference calls.

7. Evaluation
Two independent evaluators were positioned to monitor the conduct of the exercise and assess whether exercise objectives were satisfactorily addressed. They were provided with an Evaluators’ Handbook and basic paper-based data collection tools with the option of electronic completion. This was augmented by similar tools provided to all participants so that they could record personal observations, problems and track any of their activities, such as telephone calls and personal consultations, that were not captured through routine electronic communication. Immediately following the exercise participants, evaluators, controllers and observers were debriefed to identify those aspects of the exercise experience that were most immediately memorable and significant for people. The After Action Report provided a distillation of the more important lessons to be learnt from the exercise.

8. Lessons learnt
The exercise provided an excellent opportunity to discover strengths and areas for improvement in attempts to control large communicable disease outbreaks and in the way simulation exercises are conducted. The findings are described in detail in the official after action report. A key strength clearly demonstrated by the exercise was the inherent technical expertise of WHO, which is available to countries during communicable disease outbreaks. One prominent lesson identified through the exercise was that, given the logistical constraints in deploying materials and personnel and the risks of not responding quickly, it is safer to be proactive and deploy resources in waves, despite the consequences of lacking data, than to suffer the consequences of responding too late.

1. Background
China has developed laws and regulations to facilitate the response in the case of an influenza pandemic. China has been improving surveillance and alerting mechanisms and is trying to identify pneumonia cases with unknown causes as they arise because this has proven to be an efficient method of identifying suspected human infections with avian influenza at an early stage. China is enhancing the capacity of the emergency response through exercise and training.

Mainland China, Hong Kong and Macao are all subject to the same legislation and policy related to pandemic response, but because each has a different system there have been different interpretations and levels of implementation of the legislation. The government is working on methods to synchronize the three systems to engender an effective response among them. Mainland China, Hong Kong and Macao have all subscribed to the Implementation Rules of the Collaboration Agreement on the Public Health Emergency Response Mechanism. Based on this document, China implemented the Great Wall exercises on 13 November 2006 and Great Wall 2007 on 3 December 2007 in mainland China, Hong Kong and Macao.

2. Objectives
Objectives of the exercise that are featured in this section were:

- to improve the coordinating mechanism and communication channels for emergency response management and techniques in mainland China,
- to test influenza pandemic emergency response preparedness;
- to share experience in response to severe communicable diseases and other public health emergencies and make preparations for the response to a possible pandemic.

3. Participating agencies and organizations
Participating agencies include:

- Ministry of Health
- Jiangsu Provincial Health Bureau
- Hong Kong Department of Health
- Macao Department of Health
- China Centres for Disease Control and Prevention (CDC)
- other relevant ministries and technical organizations.

4. Type of exercise
Full-scale exercise.

5. Preparation for the exercise
In the preparation of the exercise, the following activities were conducted:

- Meetings were held to discuss the design of the exercise, coordinate the development of the exercise protocol, test the audiovisual equipment, discuss information dissemination etc.
- A field visit was conducted to supervise the preparation of the field part of the exercise in Jiangsu province, and identify and solve existing problems.
- Design and development of the exercise scenario were conducted.
- The exercise protocol and script were developed and revised.
- Rehearsals of the exercise were undertaken to identify and solve the existing problems in the preparation.

6. Conduct of the exercise
The exercise took place in Beijing, Jiangsu province, Hong Kong and Macao, which were linked with the aid of audiovisual technology. Officials and experts from the Ministry of Health, Jiangsu Provincial Health Bureau, Hong Kong Department of Health, Macao Department
Influenza patients are transferred by ambulance, Great Wall 2007 exercise, Jiangsu province.

of Health, China Centres for Disease Control and Prevention (CDC) and other relevant ministries and technical organizations participated in the conduct of the exercise. Vice-Minister Wang Longde of the Ministry of Health attended the opening ceremony to show support for the exercise and the pandemic influenza response in general. Director-General Chen Xianyi of the Office of Health Emergency of the Ministry of Health chaired the opening ceremony.

The Great Wall 2007 exercise simulated a cluster of human infection with avian influenza in a family with three confirmed cases and two close contacts. All the cases had the same exposure history – visiting a poultry market. One individual travelled to Hong Kong and Macao before the symptoms appeared. The joint response and action mechanism, including control and prevention measures and risk communication, was tested.

The exercise resulted in the following conclusions:

- The virus gene did not mutate, which showed the virus had not obtained the ability to efficiently transmit from human to human.
- With the efforts of the health administrative authorities the epidemic was controlled efficiently, all cases were cured and all their close contacts were discharged without the appearance of clinical symptoms.

7. Evaluation
Evaluation of the exercise was conducted by an expert team after the exercise had concluded. A summary meeting to discuss the performance of the exercise was held with the participation of key representatives from the participating agencies. The national plan was reviewed in light of lessons learnt in the exercise.

8. Lessons learnt
The Great Wall 2007 exercise was found to have effectively simulated the response system in all three regions and found that information sharing channels and coordination were smooth. In order to conduct a joint response to an influenza pandemic, training is important in overcoming the barriers identified in the exercise. It is also crucial to strengthen international communication, training and research to enhance the capacity of the three regions.
1. Background
The Secretariat of the Pacific Community (SPC), through delivery of the Pacific Regional Influenza Pandemic Preparedness Project (PRIPPP), is a partner in promoting emergency preparedness across the South Pacific region for both an influenza pandemic (primarily a public health emergency with multisectoral consequences) and an outbreak of avian influenza (primarily an agricultural emergency with public health consequences).

Fiji commenced its influenza pandemic preparedness planning in 2004, which resulted in the development of the Fiji Islands National Influenza Pandemic Plan (FINIPP 2006). The Fiji Islands National Influenza Taskforce (FINIT) led the process of national consultation culminating in the development of FINIPP and has subsequently provided a high-level forum through which various issues and gaps in preparedness for an influenza pandemic and an outbreak of avian influenza have been identified and allocated to relevant sectors to be addressed. Although the national taskforce is multisectoral in nature, FINIPP currently remains largely health sector focused. Non-health sectors, such as essential services, law and order, and commercial service providers (e.g. banks and transport companies), will develop sector-specific subplans that link to FINIPP, thus underpinning influenza pandemic preparedness within each sector.

The FINIPP testing exercise took place during 4–5 December 2007.

2. Objectives
The primary objectives of the FINIPP testing exercise were to:
• assess Fiji’s existing FINIPP and subplans for completeness and identify and document any gaps in the existing plan;
• provide an opportunity for participants with little previous exposure to FINIPP to familiarize themselves with the plan;
• provide an opportunity for stakeholder participation in the identification of gaps or inadequacies in the existing plan (and subplans) and contribute to the development of improvements and solutions;
• improve linkages within and between the different sectors involved in preparedness for an influenza pandemic or outbreak of avian influenza;
• assess the adequacy of standard operating procedures for specific responses (particularly relevant where untrained personnel are expected to have an emergency response role);
• provide a forum for general discussion on issues relevant to improving emergency preparedness in Fiji for an influenza pandemic and an outbreak of avian influenza.

3. Participating agencies and organizations
Participation in the exercise was wide ranging with 72 representatives from a number of organizations, outlined in Table 4.

<table>
<thead>
<tr>
<th>Participating agencies and organizations</th>
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<tbody>
<tr>
<td><strong>Government of Fiji ministry representatives</strong></td>
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<tr>
<td>Ministry of Health</td>
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<tr>
<td>Ministry of Agriculture, Fisheries and Forestry</td>
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<td>Ministry of Primary Industry</td>
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<td>Ministry of Education</td>
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<tr>
<td>Ministry of Transport</td>
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<tr>
<td>Fiji Islands Maritime Safety Authority</td>
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<tr>
<td><strong>Regional development partners</strong></td>
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<tr>
<td>United Nations Children’s Fund (UNICEF)</td>
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<td>WHO</td>
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<tr>
<td>SPC/PRIPPP</td>
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<tr>
<td><strong>Tertiary institutions</strong></td>
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<tr>
<td>Fiji School of Medicine</td>
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<tr>
<td><strong>Private industry</strong></td>
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<tr>
<td>Ram Sami &amp; Sons (poultry production)</td>
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<td>Goodman Fielder</td>
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<td>Mobil Oil</td>
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<td><strong>Volunteer organizations</strong></td>
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<tr>
<td>Red Cross</td>
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<tr>
<td>St John’s Ambulance Brigade</td>
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<tr>
<td><strong>Media</strong></td>
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<td>Fiji Times</td>
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</tbody>
</table>
4. Type of exercise
TTX

5. Preparation for the exercise
Planning for the FINIPP testing exercise was undertaken in consultation with the Fiji Ministry of Health (which currently provides the chair of the FINIT), WHO (Suva Office), PPRP and numerous other key agencies and stakeholders. A modified TTX format, using a number of different scenarios, was agreed as the method of plan testing that would be most appropriate and would enable engagement of the various participating sectors and agencies. It was also agreed that representation from each of Fiji’s main geographic regions (northern, central and eastern divisions) was critical to enable the national plan to be effectively tested from both urban and provincial perspectives.

6. Conduct of the exercise
The plan testing exercise commenced with the delivery of a number of information sessions (including an overview of avian and pandemic influenza, an Asian experience with preparedness planning – case study of the Philippines and an infection control drill) directed by a chairperson.

After the information sessions, scenarios were then introduced to the participants, who were seated at designated tables to enable easy communication between participants within different sectors (disaster management and national planning, health (national and divisional), animal health and agriculture, biosecurity and border control (including port of entry), security (law and order), workforce, volunteer organisations, media, economy, education and institutions, essential services and communications).

The scenarios raised a range of issues relevant to avian and pandemic influenza preparedness and response, including early warning, communications issues, rapid response, border control issues (particularly quarantine), surge capacity and pandemic impact control and management.

Facilitators were identified to moderate sessions, with each scenario being communicated to participants via large screen projection, the session moderator and hard copy.

Subsequent discussions were then held in small (sector-focused) work groups where participants were asked to consider the scenarios in the context of what FINIPP (or relevant subplans) proposed as a response, in order to identify gaps and to suggest possible additions or amendments to improve the existing plans and subplans.

7. Evaluation
A narrative overview of key findings and observations, based on a collation of moderators’ comments, reporters’ notes and notes received from working groups, was collated and provided to participants via an exercise report. It is expected that FINIT will use the report as a basis for ongoing activities.

8. Lessons learnt
The lessons learnt from this exercise included:
• Leadership arrangements for emergency preparedness (for an influenza pandemic) in non-health sectors need to be clarified through consultation with the National Disaster Management Office (NDMO) in the first instance, and relevant chief executive officers and ministers as required. It may be useful for a third party (such as SPC/WHO) to facilitate discussion between relevant agencies.
• Individual sectors need to move forward subplan development and document emergency response subplans for an influenza pandemic as a high priority. This includes the development of an avian influenza emergency response subplan by the Ministry of Agriculture, Fisheries and Forestry.
• The availability of locally relevant information, education and communication materials to enhance community awareness about avian influenza and pandemic influenza should be reviewed. Awareness-raising materials should include information on disease reporting, disease risks and safe handling and disposal practices for sick or dead birds, as well as information on human symptoms, disease transmission, prevention and infection control measures.
• The adequacy of rapid response triggers in FINIPP should be reviewed, particularly the sensitivity of detection of suspicious clusters of significant human disease that could represent the initial occurrence of a pandemic influenza virus in Fiji.
• The diagnosis of avian influenza and pandemic influenza in humans should be included at relevant
Participants are arranged in groups to maximize opportunity to cross-reference and communicate.

- The Ministry of Agriculture, Fisheries and Forestry should review its information management systems and arrangements for the management of disease reporting.
- Emergency preparedness planning for animal disease incursions will need to include compensation arrangements to encourage cooperation of producers and livestock owners (commercial, semi-commercial and backyard) when destocking is the preferred management method to achieve disease eradication.
- The adequacy of legislative arrangements to support disease reporting and emergency measures in an animal health emergency should be reviewed.
- A stockpile of suitable PPE should be maintained at ports of entry for the use of border agency personnel, as circumstances require.
- Border personnel should be trained in the use of PPE and must receive training in infection control measures to minimize the risk of disease transmission when they are required to assist in the management of sick passengers.
- The support roles of relevant agencies during a pandemic (particularly the NDMO) should be confirmed.
- FINIPP is an effective, overarching, health sector-focused emergency preparedness plan for an influenza pandemic. In reviewing the plan, consideration should be given to how the plan could be made more user-friendly.
- Testing of divisional emergency operational sub-plans that link to FINIPP should be planned and conducted to enhance health sector operational preparedness for an influenza pandemic.
1. Background
In preparation for the next influenza pandemic, Indonesia has developed an operational plan to respond to a cluster of human cases caused by a new influenza virus. This first cluster of cases is termed the ‘epicentre’ and the objective of the plan is to stop (or contain) the spread of the virus. The Indonesian plan is therefore called the Epicentre Containment Protocol. The protocol encompasses all the required technical and operational elements and involves relevant governmental sectors at different organizational levels, nongovernmental organizations and communities.

A full-scale simulation exercise was carried out in Bali from 25 to 27 April 2008 to test the protocol. The simulation involved multiple ministries and agencies across the central, provincial and district levels of government.

2. Objectives
The aim of the simulation was to test and later revise the protocols and operational capacity of Indonesia to promptly and effectively contain an epicentre of human-to-human transmission of a novel influenza virus. Nine operational areas were covered: command and coordination, risk communication, logistics, surveillance, pharmaceutical intervention, non-pharmaceutical intervention, medical response, perimeter control and port control.

3. Participating agencies and organizations
The simulation exercise involved multiple agencies and ministries from the Government of Indonesia, the Bali provincial government, Jembrana and Tabanan district governments (in Bali), the airport authorities, the police and the military.

Simulation participants were relevant individuals at village, subdistrict, province and central levels, all health facilities and all supporting sectors, including those listed in Table 5.

The exercise involved almost 1000 planners and participants from all government levels and sectors. In addition, there were more than 50 observers from international organizations and more than 150 local observers at the event.

Table 5
Participating agencies and organizations

| National Commission for Avian Influenza and Pandemic Influenza |
| Ministry of Health |
| Coordinating Ministry for People’s Welfare |
| Ministry of Social Welfare |
| Ministry of Research and Technology |
| Ministry of Environment |
| Ministry of Internal Affairs |
| Ministry of Foreign Affairs |
| Ministry of Transportation |
| Ministry of Communication and Information |
| Ministry of Agriculture |
| Ministry of Finance |
| Ministry of Education |
| Armed Forces |
| Police Forces |

4. Type of exercise
Full-scale exercise. This was the first full-scale containment exercise of its kind in the world, distinct from sev-
eral functional exercises that had been conducted in other countries.

5. Preparation for the exercise
Preparation for the Bali exercise took more than eight months and was divided into seven steps:
1. approval from the Minister of Health
2. identifying and notifying partners
3. forming the working groups (based on nine key areas)
4. identifying and mobilizing resources
5. training and orientation of field officers
6. implementation of the exercise
7. evaluation and final reports (in progress).

The working group assignments were:
• collecting and reviewing relevant guidelines
• finalizing the objectives
• drafting the scenario
• calculating the budget
• creating an implementation plan.
Preparations for the simulation exercise over the previous year had included the following activities:
• finalizing the overall guidelines for outbreak

The Bali simulation exercise highlighted Indonesia’s intersectoral capability and capacity to mount an epicentre containment operation.

− simulation exercise proper;
− evaluation and integration of lessons learnt into the final documents.

6. Conduct of the exercise
The three-day exercise took place in multiple locations in Bali. The exercise scenario illustrated the Government of Indonesia’s operational plans for rapid response and containment of early human-to-human transmission of H5N1 avian influenza.

The exercise covered nine key areas identified by the Government of Indonesia as key to the containment of an outbreak:
1. Command and coordination: delineates the command structure at the central, provincial, district and field levels, including communications within the different command levels.
2. Risk communication: provides a guide to the communication of messages to the population to ensure public compliance, and to media communications to ensure the right messages are portrayed within and outside Indonesia.
3. Logistics, including essential supplies and services: delivery of supplies necessary for the containment effort, and ensuring the continued presence of essential supplies and services for the population within the containment area.
4. Surveillance: early detection of human-to-human transmission, and increased surveillance (active and passive) to detect additional cases for early isolation and treatment. Also includes contact tracing, especially for cases outside the containment area for quarantine and antiviral prophylaxis.
5. Pharmaceutical intervention, including antivirals, PPE, vaccines: the distribution of adequate quantities of antivirals (oseltamivir) for treatment and prophylaxis; personal protection and infection control in the containment area, health centres and hospitals; and priority for vaccination when vaccines are available.
6. Non-pharmaceutical intervention: social distancing measures, including the closure of schools, public gathering places and workplaces, and home quarantine for close contacts.
7. Medical response: case management and isolation of cases, infection control procedures and segregation of influenza patients from other patients, including the closure of hospitals.
8. Perimeter control: quarantine of the containment area and other similarly affected areas (e.g., hospitals), and the screening and decontamination of visitors entering or leaving the area.
9. Port control: exit screening and border controls to prevent the exportation of cases outside Indonesia, including the use of health alert cards and thermal imaging.

The scenario for Day One of the exercise simulated epidemiological investigations in the community, case management and referral to the influenza referral hospital, district command and coordination activities and reports to provincial and national levels.

Day Two of the exercise simulated initiation by the Regent (head of district) and related stakeholders of necessary preventive measures in the face of epidemiological evidence of early human-to-human transmission, and full epicentre containment and quarantine efforts when virological results indicated that the H5N1 virus had mutated to a form that allowed efficient human-to-human transmission.

Day Three of the exercise simulated containment activities in full swing, encompassing all components of the nine key areas detailed above. During this time the airports were actively controlling human and logistic traffic from the containment area. The simulation exercise ended with the lifting of the area quarantine and announcement by the Minister of Health of the successful containment of the pandemic influenza outbreak.

7. Evaluation

The more than 50 international and over 150 local observers provided feedback and shared their observations on the conduct of the simulation and activities undertaken. An evaluation meeting discussed this feedback and considered appropriate next steps for pandemic preparedness.

The simulation report will be prepared and key lessons included in the final outbreak containment documents. In addition to the final report, a video of the simulation will be produced, including the planning process and evaluation.

There are also plans to produce final guidelines, protocols and operational procedures for outbreak containment in Indonesia based on the feedback and evaluation. These will then be packaged into a training programme for all provinces and districts. Train-the-trainer sessions will be conducted whereby master trainers will be trained to perform advocacy and conduct pandemic preparedness training and simulations in the various provinces and districts.

There are also plans for the development and testing of similar operating procedures for a full-scale pandemic, as this will be synergistic with outbreak containment.

8. Lessons learnt

The Bali simulation exercise highlighted Indonesia's intersectoral capability and capacity to mount an epicentre containment operation. Participants applied the protocols and developed innovative solutions to problems that arose during the simulation. There was universal agreement from all international observers that the exercise was extremely well planned and conducted, and that it will make a significant contribution to local preparedness planning, as well as planning efforts at regional and global levels.

Implementing epicentre containment is a cross-cutting, intersectoral activity that necessitates clear technical guidance, clear chains of command, and clear roles and responsibilities. In general, the Bali simulation exercise highlighted the need to have protocols that are practical and adaptable to unfolding situations, and that can succinctly communicate the advised courses of action.

Specific lessons learnt for each of the nine areas in the protocol are shown in Table 6 below.

The Government of Indonesia is now revising the protocols to incorporate the lessons learnt from the Bali simulation exercise. A second edition of the protocol is expected by September 2008. The next steps include the development of a training manual and programme to inculcate the practices across the country.
### Table 6: Lessons Learnt

<table>
<thead>
<tr>
<th>Protocol area</th>
<th>Lessons learnt</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Command and coordination</td>
<td>Further detailing on the different levels of the command structure, and integration into existing disaster-response mechanisms is needed.</td>
</tr>
<tr>
<td>2. Risk communication</td>
<td>Multiple modalities should be used to communicate messages to the public (loudspeaker, flyers). Messages should be developed that are both clear and acceptable.</td>
</tr>
<tr>
<td>3. Logistics</td>
<td>A rapid needs assessment should be conducted by the trained rapid response team. Resource and fund management should be included in the protocol.</td>
</tr>
<tr>
<td>4. Surveillance</td>
<td>Specific criteria for when to escalate containment activities should be developed. Infection control needs of surveillance officers should be reviewed.</td>
</tr>
<tr>
<td>5. Pharmaceutical intervention</td>
<td>Provision of antiviral supplies to households at the beginning of containment is more feasible than daily directly observed therapy.</td>
</tr>
<tr>
<td>6. Non-pharmaceutical intervention</td>
<td>Specific protocols are required for relatives of quarantined individuals who reside outside containment zones (e.g. children at boarding schools). Measures should be put in place to enhance compliance of children with quarantine orders.</td>
</tr>
<tr>
<td>7. Medical response</td>
<td>Establishment of a field hospital within the containment zone and the criteria for when such a measure is feasible should be considered. Feedback should be provided to health-care centres about suspected cases for appropriate infection control measures to be instigated.</td>
</tr>
<tr>
<td>8. Perimeter control</td>
<td>The needs and ratios of personnel required to enforce the containment zone should be considered.</td>
</tr>
<tr>
<td>9. Port control</td>
<td>Details for infection control and triage procedures are important.</td>
</tr>
</tbody>
</table>
1. **Background**

Pandemic preparedness by the Government of Japan involves the following components and processes:

1. **Development of the Pandemic Influenza Preparedness Action Plan:** The Action Plan was developed in November 2005, and has been revised three times to date reflecting the feedback from exercises and other activities.

2. **Development of guidelines:** 13 operational guidelines (1. quarantine, 2. surveillance, 3. active surveillance, 4. rapid response, 5. medical care, 6. infection control, 7. diagnostic test, 8. vaccination, 9. antivirals, 10. community mitigation, 11. workplace mitigation, 12. risk communication, 13. burial) have been developed to supplement the Action Plan.

3. **Stockpiling antivirals.**

4. **Stockpiling pre-pandemic vaccines.**

5. **Legislation revision:** laws and administration guidance were amended to address pandemic situations.

6. **Simulation exercises.**

7. **Collaboration with other countries.**

Three national simulation exercises have taken place to date: in September 2006, February 2007 and November 2007. This section features the exercise that took place in November 2007.

2. **Objectives**

The objectives of the exercise were to:

- examine the feasibility of the recently revised Action Plan and guidelines among relevant ministries and agencies;
- test and reinforce the cooperation among relevant ministries and agencies, local government agencies and quarantine stations.

3. **Participating agencies and organizations**

<table>
<thead>
<tr>
<th>Participating agencies – central level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cabinet Secretariat</td>
</tr>
<tr>
<td>Cabinet Office</td>
</tr>
<tr>
<td>National Police Agency</td>
</tr>
<tr>
<td>Ministry of Defence</td>
</tr>
<tr>
<td>Financial Services Agency</td>
</tr>
<tr>
<td>Ministry of Internal Affairs and Communications</td>
</tr>
<tr>
<td>Fire and Disaster Management Agency</td>
</tr>
<tr>
<td>Ministry of Justice</td>
</tr>
<tr>
<td>Ministry of Foreign Affairs</td>
</tr>
<tr>
<td>Ministry of Finance</td>
</tr>
<tr>
<td>Ministry of Education, Culture, Sports, Science and Technology</td>
</tr>
<tr>
<td>Ministry of Health, Labour and Welfare</td>
</tr>
<tr>
<td>Ministry of Agriculture, Forestry and Fisheries</td>
</tr>
<tr>
<td>Ministry of Economy, Trade and Industry</td>
</tr>
<tr>
<td>Nuclear and Industrial Safety Agency</td>
</tr>
<tr>
<td>Agency for Natural Resources and Energy</td>
</tr>
<tr>
<td>Small and Medium Enterprise Agency</td>
</tr>
<tr>
<td>Ministry of Land, Infrastructure, Transport and Tourism</td>
</tr>
<tr>
<td>Japan Coast Guard</td>
</tr>
<tr>
<td>Ministry of the Environment</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other participating agencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chiba Prefectural Government</td>
</tr>
<tr>
<td>Narita Airport (over 100 quarantine officers (Narita and other port/airport), customs, immigration, airline, and airport staff)</td>
</tr>
<tr>
<td>Narita Red Cross Hospital</td>
</tr>
<tr>
<td>Other local response agencies such as the police station and fire department</td>
</tr>
</tbody>
</table>

4. **Type of exercise**

Full-scale exercise (Functional exercise at central and provincial level, drills at airport and hospital)

---

5. Preparation for the exercise
The exercise planning team was established, consisting of staff from the Cabinet Secretariat and the Ministry of Health, Labour and Welfare (MHLW). In preparation:
• preliminary meetings among central and prefecture government and quarantine stations took place six times;
• interagency meetings among relevant ministries and agencies took place four times;
• meetings of MHLW took place twice.

6. Conduct of the exercise
The exercise started at the Prime Minister’s Office, where the Chief Cabinet Secretary and Health Minister announced its commencement. Then government officials went back to their own agencies and prepared for the exercise. The exercise was controlled by the Cabinet Secretariat (CS), which developed and distributed scenarios to participating agencies prior to the exercise. Each agency identified focal points who received questions from the CS, shared them within their agencies and consolidated and sent back responses to the CS throughout the exercise.

Under six evolving scenarios that developed from WHO Pandemic Phases 3 to 6, common as well as targeted questions were sent via e-mail to participating agencies. These agencies were expected to send responses within two hours, having made decisions and completed due internal and external consultation processes. Questions included development of risk communication messages, decisions on distribution of stockpiled antivirals and H5N1 vaccines, process for pandemic influenza vaccine development, protection of offshore Japanese nationals, decisions on border control and domestic transportation and response under constraints resulting from staff absenteeism.

Drills took place at Narita Airport and at Narita Red Cross Hospital. The scenario started with a suspect case on board an aircraft coming from an infected country. They tested the process and procedures for passenger separation on board; health check-ups by quarantine medical staff; patient transfer to and isolation at Narita Red Cross Hospital; and handling of close contacts, remaining passengers and baggage. The drills were accompanied by training on the appropriate use of PPE, and repeated several times for quarantine staff coming from other duty stations. The drills were also broadcast to all prefectures through a television conference system, which enabled relevant local government staff to observe the exercise.

7. Evaluation
The exercise was observed by experts from the National Institute of Infectious Disease and the United Nations, who provided evaluation feedback after the exercise. Participants were also given opportunities to provide feedback. The After Action Report was compiled and posted on a web site.

8. Lessons learnt
8.1 Preparation for and conduct of the exercise
Since this was the third national exercise for the Government of Japan, and many of the staff were quite familiar with the Action Plan and guidelines, there was little confusion in responses to the series of questions. Some participants even expressed desire to have received more tricky and challenging questions so that they could learn new lessons and find new insights from the exercise.

The exercise took a whole-of-government and multi-tiered approach, and was thus very useful and successful in involving many stakeholders who should play due roles in times of a real pandemic. On the other hand, because of this comprehensiveness and time pressure, apart from the drills that took place at the airport and hospital, it did not fully test the nuts and bolts of the real operational capacity and capability of MHLW, and thus did not go beyond what is covered in the existing guidelines. Therefore, in addition to multisectoral exercises, an exercise focused on a single agency could also be of use to test details.

8.2 Pandemic preparedness
The gaps identified included criteria and decision-making processes for border control measures for incoming aircraft. Such measures are supposed to be put in place in accordance with International Health Regulations (IHR) 2005, whose purpose and scope is to prevent, protect against, control and provide a public health response to the international spread of disease in a manner that avoids unnecessary interference to international traffic and trade. However, given the wide variety of issues that need to be taken into consideration, including evacuation of offshore nationals, such decisions will need to be made on a case-by-case basis, and it would not be easy to articulate this in guidelines as criteria.

Other identified gaps include a lack of common understanding of the business continuity plan under pandemic conditions.

1. Background
The Lao People’s Democratic Republic Avian Influenza Control and Pandemic Preparedness Plan was developed in January 2006 and later the National Avian and Human Influenza Coordination Office (NAHICO) was established to ensure the effective implementation of avian and human influenza activities. To date, two human cases of avian influenza have been reported in the Lao People’s Democratic Republic. Among various activities, the government is prioritizing the strengthening of its capacity to implement rapid containment of a novel strain of influenza virus with pandemic potential. In this climate, the Lao Government ran a simulation exercise called PanStop II on 6 December 2007.

2. Objectives
The purpose of the exercise was to assess the effectiveness of the Lao People’s Democratic Republic National Protocol for Rapid Containment of Pandemic Influenza, developed by the Ministry of Health and NAHICO, with technical assistance from WHO, and to identify strengths and opportunities for improvement in planning and operational capabilities.

3. Participating agencies and organizations

<table>
<thead>
<tr>
<th>Table 8</th>
<th>Participating agencies and organizations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Health</td>
<td></td>
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<tr>
<td>National Centre for Laboratory and Epidemiology (NCLE)</td>
<td></td>
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<tr>
<td>Local hospitals</td>
<td></td>
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<tr>
<td>National Disaster Management Office (NDMO)</td>
<td></td>
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<tr>
<td>Ministry of Defence</td>
<td></td>
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<tr>
<td>Social and Cultural Department</td>
<td></td>
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<tr>
<td>District representatives</td>
<td></td>
</tr>
<tr>
<td>Centre for Information and Education for Health (CIEH)</td>
<td></td>
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<tr>
<td>Ministry of Agriculture and Forestry</td>
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<tr>
<td>Medical University</td>
<td></td>
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<tr>
<td>Lao Red Cross</td>
<td></td>
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<tr>
<td>United Nations Children’s Fund (UNICEF)</td>
<td></td>
</tr>
<tr>
<td>Academy for Educational Development (AED)</td>
<td></td>
</tr>
<tr>
<td>National Avian and Human Influenza Coordination Office (NAHICO)</td>
<td></td>
</tr>
<tr>
<td>United Nations Avian and Human Influenza Coordination Unit/United Nations Resident Coordinators Office</td>
<td></td>
</tr>
</tbody>
</table>

Total number of participants: 27 role players, 2 facilitators, 2 evaluators, 7 observers and 5 note takers/secretariat.

4. Type of exercise
TTX
The scenario-based exercise stimulated discussions of the actions that would need to be taken in the event of sustained human-to-human transmission of a novel influenza virus somewhere within the Lao People’s Democratic Republic. It addressed multi-agency involvement in responding to and rapidly containing the outbreak.
5. Preparation for the exercise
The exercise facilitation team was set up in WHO Regional Office for the Western Pacific, which designed the conduct of the exercise.

6. Conduct of the exercise
The exercise was conducted in one day. The participants were representatives from the Ministry of Health and other key players identified by the government and WHO Country Office. The exercise was in the format of a TTX, which is primarily a discussion guided by one or more facilitators. Its purpose was to identify issues and solve problems as a group. The exercise was designed in English with presentations translated into Lao. Two bilingual facilitators guided the exercise in Lao. Bilingual evaluators observed the proceedings and progress made towards achieving the objectives and transcribed their observation notes into English.

The scenario described the detection of a novel influenza strain in a small village outside the capital, Vientiane, which had begun to show increased transmission between humans. The outbreak suggested efficient transmission of a probable pandemic strain. The Government of the Lao People’s Democratic Republic, in consultation with WHO, decided to attempt a rapid containment of the outbreak.

The first part of the exercise provided sufficient orientation to the concepts involved in rapid containment so that all participants could have a similar understanding. The scenario then stimulated discussions of the actions that would need to be taken in the event of sustained human-to-human transmission of a novel influenza virus within a limited geographical area somewhere in the Lao People’s Democratic Republic. It addressed multi-agency involvement in responding to and rapidly containing the outbreak.

7. Key findings
- The objectives of the PanStop II exercise were achieved, and some areas for strengthening the Lao People’s Democratic Republic National Protocol for Rapid Containment of Pandemic Influenza were identified. In their evaluations, participants were generally satisfied with the information exchange.
- Government and nongovernmental agencies that participated were introduced to the importance of planning for their role in a potential pandemic, particularly with respect to the need for leadership and decision-making at the national level and collaboration at all levels (village, district, province and national government) in the early stages of planning.
- The exercise revealed much common understanding of the issues that the protocol raises, though several issues need attention to make the protocol operational (addressed in more detail in Section 8, Lessons learnt).
  - Successful management and coordination are highly dependent on the timely communication of reliable information. Apart from recognition of some reporting requirements, there seemed to be little consideration of the processes and procedures that need to occur to ensure that sufficient information is collected, analysed and transmitted to support rapid and appropriate management decision-making.

Exercise participants were able to develop or enhance their understanding of the protocol and were able to identify issues.

- While there was broad recognition of the need for a coordinated, multi-sectoral approach to the implementation of rapid containment, there was little identification of responsible organizations and their roles, with the exception of the health sector. It is therefore necessary to pre-establish, communicate and practise the coordination and management mechanisms in advance of the event. As the protocol evolves it would be helpful to identify specific responsible positions (not persons) in the agencies, to eliminate any potential ambiguity of responsibility and authority.
- The Lao Government needs to develop a summary for rapid containment as an annex to the protocol to incorporate the following five broad categories of management and coordination activities for rapid containment:
  - policy-level leadership and decision-making
  - operational management
  - planning
  - logistics
  - finance, procurement and administration.

A technical working group (existing or new) should be assigned responsibility for this task.
- The Lao Government needs to develop a logistics plan that addresses the basic issues of storage and distribution so that required materials can be where they are needed in hours not days; and delineates approved, expedited processes for clearing drugs, equipment, supplies and personnel entering the
country. One or more of these could probably be expanded to cover the essential components of a broader logistical plan or, alternatively, an additional annex to the protocol could be developed. Existing technical working groups and their host agencies should be canvassed for personnel who can contribute to the development of a logistics plan for inclusion as an annex to the protocol.

- The Lao Government needs to develop an outbreak communication plan. This is an aspect of risk communication that is considered a key component of a rapid containment operation.

- For future exercises, the Lao Government needs to ensure there is sufficient time and training of the bilingual exercise team so that they can conduct the exercise effectively, make their own observations and prepare the evaluation. In designing future exercises, it is recommended that sponsors and planners pay careful attention to purpose, objectives and scope and ensure that all the sponsoring parties concur with any changes in these, with sufficient time to incorporate them into the planning and design process.

8. Lessons learnt

- Overall, the exercise was successful. By its nature it was somewhat exploratory and therefore provided more orientation and training than evaluation. Nevertheless, through the discussions stimulated by the scenario presentations and with the prompting by key subject matter experts and leaders, exercise participants were able to develop or enhance their understanding of the protocol and were able to identify issues that would impede or enable successful implementation and management of a rapid containment operation.

- As the national protocol continues to evolve, and operational aspects are specified, there will be new opportunities to exercise components of the protocol and to practise different types of exercises, such as the functional exercise, which is better for addressing operational decision-making and coordination.

A report on the exercise was completed in June 2008.13

13 http://www.wpro.who.int/NR/rdonlyres/61EB5534-5314-429C-91A7-9BAFE2208B05/0/ce_mr.pdf
1. Background
In January 2006, the Government of Malaysia developed and launched a National Influenza Pandemic Preparedness Plan (NIPPP)\(^\text{14}\) and related strategies, in which the Ministry of Health is designated as the lead agency of the response to pandemic outbreaks, with coordination by the Disease Control Division. However, in the event that a pandemic occurs requiring multiple agency activities, the National Security Council (NSC), headed by the Deputy Prime Minister, will assume leadership of the response.

The Ministry of Health will continue to play the role of lead agency in pandemic control under the NSC and will coordinate the overall public health and medical emergency response across federal departments and agencies at all levels.

As one of the strategies to enhance pandemic preparedness, the Ministry of Health has held a series of pandemic influenza simulation exercises at various levels, named ExPanFlu 1 and ExPanFlu 2. These were part a series of exercises designed to evaluate Malaysia’s preparedness plans for a pandemic influenza outbreak. This series of exercises included:

- health response TTX – 23 March 2006
- Ministry of Health intra-agency TTX – 24 March 2006
- interagency TTX – 4 April 2006
- medical response drill (ExPanFlu 1) – 1–2 August 2006
- public health response drill (ExPanFlu 2) – 14 September 2006

This section will elaborate on ExPanFlu 1 and ExPanFlu 2.

2. Objectives
The aim of ExPanFlu was to test and consolidate the NIPPP at various levels among key government agencies and health-care institutions. It was also intended to assess surveillance and response policies and systems, decision-making structures, coordination mechanisms and the relationship between the Ministry of Health at various levels and other relevant agencies.

The overall objectives were to assess the level of preparedness, test the feedback mechanism and improve the systems for dealing with an influenza pandemic. The specific goals were to evaluate the implementation of the Pandemic Influenza Plan of Action in health-care facilities and at Kuala Lumpur International Airport (KLIA), to review interagency coordination and networking, and to assess the capacity of operational activities in managing an emergency situation.

Areas of pandemic response targeted include:
- surveillance;
- infection control mechanism;
- movement of cases;
- contact tracing;
- proper usage of PPE;
- medical response;
- border control;
- effective communication and coordination within the Ministry of Health and with other agencies.

3. Participating agencies and organizations

<table>
<thead>
<tr>
<th>Table 9 Participating agencies and organizations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ExPanFlu 1</strong></td>
</tr>
<tr>
<td>Ministry of Health headquarters</td>
</tr>
<tr>
<td>State Health Departments</td>
</tr>
<tr>
<td>District Health Offices</td>
</tr>
<tr>
<td>Hospitals and health clinics</td>
</tr>
<tr>
<td><strong>ExPanFlu 2</strong></td>
</tr>
<tr>
<td>Ministry of Health</td>
</tr>
<tr>
<td>Malaysia Airport Berhad</td>
</tr>
<tr>
<td>Department of Civil Aviation (DCA)</td>
</tr>
<tr>
<td>Malaysia Airlines System (MAS)</td>
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<tr>
<td>Department of Immigration and Customs</td>
</tr>
<tr>
<td>Kuala Lumpur International Airport (KLIA) health office</td>
</tr>
<tr>
<td>Royal Malaysian Police</td>
</tr>
<tr>
<td>National Security Council</td>
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<tr>
<td>Department of Civil Defence</td>
</tr>
</tbody>
</table>

4. Type of exercise
Drill.

5. Preparation for the exercise
The exercise management team comprised 40 people from the Ministry of Health, as well as other representatives involved in the exercise. The preparation started in June 2006 and regular meetings were conducted by the Pandemic Influenza Exercise Committee and subcommittees.

As the preparation progressed, several documents were developed, including a concept paper, checklists, scenarios, alert letters, a management flowchart, and a programme book. Documentation and scripts for participants were also developed for each of the scenarios.

To create awareness among the public, the media were invited to participate in the exercise and to provide coverage of the events. Press conferences were held during both exercises.

The State Health Departments were also urged to volunteer to host the drill, ensuring their commitment to the exercises. The State of Perak and KLIA were chosen because they already had pandemic response plans to be tested. Prior to the exercise, those plans were reviewed and endorsed by the Ministry of Health.

6. Conduct of the exercise
ExPanFlu 1 lasted for two days and ExPanFlu 2 lasted for four hours. During the conduct of the exercise, the simulation exercise team assumed the following roles:
- exercise control team: communicated with facilitators and evaluators, monitored progress, determined when corrective action was required and provided the materials to enable facilitators to set the proceedings back on track;
- exercise facilitators: provided briefings and debriefings for exercise participants, provided exercise inputs, monitored progress of the exercise, ensured actions expected from exercise inputs were completed, liaised with the exercise control team and solved problems arising during the exercise;
- exercise evaluator team: observed exercise participants, noted actions taken against expected actions, assessed the performance of systems and personnel, and prepared a report on exercise conduct in their respective locations;
- exercise writing team: developed operational scenarios and scripts;
- secretariat: organized logistics (including communication and audiovisual equipment), prepared observers and provided participants.

Both exercises adopted a number of protocols to ensure smooth conduct of the exercise:
- Participants were briefed before the exercise.
- Security codes were used during the exercise to control the progress of the exercise, and to halt or end the exercise if necessary.
- The exercise management team ensured communication lines were working.
- The exercise management team ensured participants (actors) played their roles as required by the scenario, as well as their functional role in real life.
- Evaluators were stationed at strategic points and were able to move around.

The press was invited to observe the exercise and after the event, the Director of the Disease Control Division held a press conference.

The scenario was developed by the exercise writing team and was approved by the Exercise Planning and Implementation Committee headed by the Director of the Disease Control Division.

The scenario developed as the exercise progressed and included:
- lead-in events before the introduction of pandemic influenza in Malaysia – a simulated pandemic situation in neighbouring countries;
- introduction of pandemic influenza into Malaysia;
- implementation of border management strategies;
- initial pandemic influenza spread within Malaysia;
- alert notification to the State Health Department (WHO Pandemic Alert Phase 4).

7. Evaluation
During the ExPanFlu exercises, the evaluators were given access to key areas in order to assess performance. They worked off checklists developed beforehand and created an after-action report, which was circulated to all relevant parties. An exercise debriefing was conducted involving all participants and exercise controllers. It provided...
feedback on all aspects of the exercise related to issues that had been previously identified. Around 10 exercise evaluators were deployed in each of the exercises.

8. Lessons learnt

A number of lessons were identified in conducting the exercises:

- The exercises allowed clarification of certain policies and different interpretations of procedures.
- The exercises have apparently revealed that it is not sustainable to maintain a high level of readiness amongst the entire personnel of relevant agencies. Instead, having a response team and standard operating procedures will enable an organization to elicit the high-level rapid response needed if an outbreak occurs.
- The early engagement of participating agencies generated a greater level of commitment to the exercise.
- It is important to educate organizations beyond the government about preparedness, especially those from the business and industry sectors. Involving these organizations in the exercises is beneficial because it generates a more realistic and holistic response to a pandemic and builds learning.

Finally, the exercise identified a number of areas for improvement, predominantly around the clarity of the guidelines for response to a pandemic. After conducting the exercises it has been necessary to review processes and resource allocations, and update the plans and manuals accordingly.
1. Background
Pandemic preparedness measures carried out by the Government of Myanmar include the following:

- Development of the National Strategic Plan for Prevention and Control of Avian Influenza and Human Influenza Pandemic Preparedness and Response in January 2006. Subsequently, an Operational Workplan with detailed activities and budget was developed in June 2006 and revised in 2007. Another revision of the Operational Workplan is currently being developed. The National Strategic Plan is due to be revised in 2008 after the conduct of the national simulation exercise, which is expected to take place in the second half of 2008.
- Stockpiling antivirals and PPE.
- Legislation revision: laws and administration guidance are currently under review.
- Simulation exercises.
- Cross-border collaboration and networking in the region and at the global level.

A number of TTXs have been held in Myanmar. A national TTX was conducted in October 2006 in Yangon with technical support from Mekong Basin Disease Surveillance (MBDS) in close collaboration with WHO. Additional TTXs were held in November and December 2007 in eastern Shan State after the first human infection with H5N1 avian influenza in Kyaing Tong, and in March 2008 by the Ministry of Hydro-electric Power. In addition, a one-day TTX was organized at each rapid response team training, in which 17 state or division and 37 district rapid response teams have participated to date.

2. Objectives
The objectives of the exercises were to:

- examine the feasibility of the National Strategic Plan and Operational Workplan standard operating procedures;
- identify priority actions to further improve preparedness and responses;
- test and reinforce the cooperation among relevant departments and ministries, local government and organizations;
- develop recommendations to help guide the revision of the National Strategic Plan.

3. Participating agencies and organizations

<table>
<thead>
<tr>
<th>Table 10</th>
<th>Agencies and organizations participating in TTX organized by MBDS on 16 October 2006</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ministry of Health</td>
</tr>
<tr>
<td></td>
<td>Department of Medical Research</td>
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<tr>
<td></td>
<td>Livestock Breeding and Veterinary Department</td>
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<td></td>
<td>Central Epidemiology Unit, Department of Health</td>
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<tr>
<td></td>
<td>Township Medical Officers (TMO)</td>
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<td></td>
<td>Special Disease Control Units (SDCU)</td>
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<td></td>
<td>National Health Laboratory (NHL)</td>
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<td></td>
<td>Mekong Basin Disease Surveillance (MBDS)</td>
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<td></td>
<td>Yangon Airport</td>
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<td>Yangon Seaport</td>
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<td>Yangon General Hospital</td>
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<td>Mandalay Hospital</td>
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<td>Waibargi Hospital</td>
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<td></td>
<td>Ministry of Health, Lao People’s Democratic Republic</td>
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<td></td>
<td>RAND Corporation</td>
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</table>

4. Type of exercise
TTXs in central and eastern Shan State and in all rapid response team training curriculums, and drills at avian and pandemic influenza designated hospital in Yangon.

5. Preparation for the exercise
An exercise planning team was established consisting of staff from the Central Epidemiology Unit (CEU), Department of Health and other departments within the Ministry of Health, MBDS, Ayeyawady-Chao Phraya-Mekong Economic Cooperation Strategy (ACMECS) and WHO. In preparation, meetings were held among:

- departments from central and state/division, and port health authority;
- agencies, including the Ministry of Health, MBDS, ACMECS, WHO.

6. Conduct of the exercise
The national TTX began with a general introduction to the exercise and an overview of simulation exercises in
Simulation exercises on influenza pandemic responses in the Asia-Pacific region

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3.2 Myanmar

TTX at Kyaing Tong, eastern Shan State.

Sequential deliberations followed in four steps. During the first three steps the exercise participants were divided into small groups to discuss two main questions related to each of the three different preparedness areas covered in the exercise. Each group was made up of representatives from various departments. English and Myanmar were used as working languages. After each of these steps, participants met together in plenary to summarize what their small groups had discussed. The exercise scenario started with human-to-human infection outside Myanmar, and evolved into a situation where Myanmar identified an outbreak of human infection of avian influenza. The scenario ended during the early phases of a pandemic, before reaching the proportions of a full pandemic.

The final step involved having participants return to the present to plan for potential future needs. Participants selected key actions and associated challenges identified during each step of the exercise and developed initial plans to begin addressing each of them. Initial action planning considered what near-term tasks to take, how to overcome expected challenges, who was responsible for each task, and an initial time-line to complete the tasks.

7. Evaluation

The national TTX was observed by experts from MBDS and WHO, who provided evaluation feedback after the exercise. Participants were also given opportunities to provide feedback. All participants and observers completed a pre-exercise evaluation on the first morning and a post-exercise evaluation at the end of the second day that enabled comparison of the effects of the exercise.

Evaluation of the national TTX was conducted by an expert team from RAND Corporation, WHO, MBDS and the Ministry of Health after the exercise had concluded. Other ministries also attended the workshop as observers. A summary meeting to discuss the performance of the exercise was held with the participation of key representatives from the participating agencies. The Operational Workplan plan was reviewed in light of lessons learnt in the exercise.

8. Lessons learnt

- **High-level government commitment, strong coordination mechanisms and collaborative working arrangements are essential.** For implementation of preparedness activities and exercises, it is important to have a coordination structure that is empowered with multi-sectional responsibilities. Such a level of coordination would foster, in the event of influenza pandemic, an effective integrated national response that would involve all technical ministers in charge of animal and human health, as well as other relevant sectors, at the national and subnational level.

- **Preparedness is a key factor for success.** While Myanmar has a National Strategic Plan and an Operational Workplan for prevention and control of an influenza pandemic, all relevant agencies and stakeholders have to be involved in contingency planning for further influenza outbreaks.

- **Regional collaboration is essential.** Attention should be given to support the integration of the country into a regional and global framework for the control of pandemic influenza, and more broadly of all transboundary animal diseases and other emerging infectious diseases, to increase cost-effectiveness and ensure the harmonization of activities and responses. Coordination with regional bodies such as ACMECS, MBDS, ASEAN and Asia-Pacific Economic Cooperation (APEC) should be enhanced.
New Zealand

Exercise Makgill and Exercise Cruickshank

1. Background
The whole-of-government *New Zealand Influenza Pandemic Action Plan*, published in 2006, summarizes the key preparations being made for pandemic influenza, and outlines the actions to be taken at different phases of a pandemic.

Many government departments have also developed their own sector-specific plans and guidelines.

Details are captured on the Ministry of Health’s web site.15

In order to practise and assess the implementation of response plans and to inform future work priorities, the Ministry of Health co-coordinated a national whole-of-government pandemic exercise programme in 2006–2007. This consisted of two exercises, *Exercise Makgill* and *Exercise Cruickshank*.

Community-based assessment centres were established for assessment of possible influenza cases, *Exercise Cruickshank*.

2. Objectives
The exercises took place over six days in 2006–2007 with the aim of practising the plans set out in the *New Zealand Influenza Pandemic Action Plan* and testing the intersectoral response at all four stages laid out in the plan. The exercise days incorporated intersectoral responses at the national, regional and local levels.

The overall objective of the exercises was to strengthen intersectoral readiness to keep out, stamp out, manage and recover from pandemic influenza in accordance with the *New Zealand Influenza Pandemic Action Plan*.

In addition, there were specific objectives for each response phase:

- ‘Keep it out’: strengthen intersectoral action to keep pandemic influenza out of New Zealand by practising the implementation of Scenario 5.1 of the *New Zealand Influenza Pandemic Action Plan* focusing on border management;
- ‘Stamp it out’: strengthen intersectoral action to control initial clusters of pandemic influenza in New Zealand by practising the implementation of Scenario 5.2 of the *New Zealand Influenza Pandemic Action Plan*;
- ‘Manage it’: strengthen intersectoral action to manage pandemic influenza with a 40% incidence rate and a 2% case fatality rate by practising the implementation of Scenario 6.3 of the *New Zealand Influenza Pandemic Action Plan*;
- ‘Recover from it’: identify and document issues, roles and functions that will need to be addressed when recovering from pandemic influenza with a 40% incidence rate and a 2% case fatality rate.

Additional subobjectives were set under the above groupings.

3. Participating agencies and organizations
*Exercise Makgill* focused on action within the health sector, and involved national and district health sector agencies.

*Exercise Cruickshank* involved participation of and input from a large number of agencies over the exercise days (see Table 11).

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Table 11
Exercise Cruickshank participants

<table>
<thead>
<tr>
<th>Health sector</th>
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<tbody>
<tr>
<td>Ministry of Health</td>
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<tr>
<td>District Health Boards</td>
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<tr>
<td>Institute of Environmental Science and Research</td>
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<td>District Health Board public health services</td>
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<td>ambulance services</td>
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<th>Central and local government agencies</th>
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<tr>
<td>Aviation Security Services of New Zealand</td>
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<td>Te Puni Kōkiri</td>
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<tr>
<td>Civil Aviation Authority</td>
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<td>civil defence groups of local authorities</td>
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<td>Department of Corrections</td>
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<td>Department of Internal Affairs</td>
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<td>Department of Prime Minister and Cabinet</td>
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<td>Inland Revenue Department</td>
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<tr>
<td>Ministry of Agriculture and Forestry</td>
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<tr>
<td>Ministry of Civil Defence and Emergency Management</td>
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<td>New Zealand Defence Force</td>
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<tr>
<td>Ministry of Economic Development</td>
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<td>Ministry of Education</td>
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<td>Ministry of Foreign Affairs and Trade</td>
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<td>Ministry of Justice</td>
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<td>Ministry of Social Development</td>
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<td>Ministry of Transport</td>
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<td>New Zealand Customs Services</td>
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<td>New Zealand Fire Service</td>
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<td>New Zealand Police</td>
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<td>Reserve Bank of New Zealand</td>
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<td>State Services Commission</td>
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<td>The Treasury</td>
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4. Type of exercise
This was a full-scale exercise, including discussion, table-top, functional, and drill components at national and local levels.

5. Preparation of the exercise
The Ministry of Health developed the exercise programme over a nine-month period with input from intersectoral and health sector advisory groups, and the Intersectoral Pandemic Planning Group.

Exercise documentation included:
- instructions for exercise facilitators and evaluators at different sites
- national coordinating and general instructions for exercise participants
- production of exercise national evaluation reports.

Each participating agency was tasked with developing its own general instructions for its own organization or sector, based on the national resources noted above.

6. Conduct of the exercise

6.1 Exercise Makgill
Exercise Makgill was carried out on 9 November 2006 over a 12-hour period. The exercise assessed the health sector’s ability around the cluster control (‘stamp it out’) stage of response to a pandemic. This exercise used a table-top approach to simulate the events that could arise during a real pandemic event. The report from Exercise Makgill is available from the Ministry of Health website.16 The report contains the lessons from Exercise Makgill, and these were used to advance planning and preparedness for response to a pandemic and to facilitate the more efficient and effective delivery of Exercise Cruickshank.

6.2 Exercise Cruickshank
Exercise Cruickshank was a whole-of-government influenza pandemic exercise led by the Ministry of Health. The exercise was held over 5 days in May 2007.

6.2.1 Exercise Cruickshank Day One
The scenario for Day One of Exercise Cruickshank was that the avian influenza virus (H5N1) was infecting and killing people in many countries and had developed into a form that could be transmitted easily between humans. The new virus had developed overseas in a part of the world where disease surveillance was poorly developed. Fatalities from influenza were initially lost against the background of deaths from other infectious and respiratory diseases so it was not immediately apparent that people were dying from influenza.

By the time the disease was recognized and confirmed, it had spread to other countries in that continent. Early cases were also found in countries in another

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region, and among foreign aid workers returning from these areas to their European home countries.

Within days of the announcement of this outbreak confirming human-to-human transmission, and with no previous warning, an Asian country with which New Zealand has significant trading and tourism links announced that influenza cases had been identified in several of its cities over a short time.

The virus did not appear to have a particularly high reproductive rate, and the scenario stated that transmission was principally between family members and non-familial close contacts. However, between 5% and 10% of cases died relatively quickly despite receiving treatment.

New Zealand took prompt action. The government directed that active border management operations should be established at all international points of entry.

Day One of the exercise practised real-time decision-making concerning the controls to be put in place, and the implementation of such relevant actions at the border.

New Zealand took prompt action. The government directed that active border management operations should be established at all international points of entry.

6.2.2 Exercise Cruickshank Day Two
The scenario for Day Two of Exercise Cruickshank was that the influenza pandemic was spreading overseas.

New Zealand was maintaining border management operations.

Four clusters of cases appeared more or less simultaneously in widely spread places across New Zealand. The cases appeared to be recent arrivals from an unaffected country. The affected District Health Boards and Public Health Units started cluster control operations. The government announced that every effort would be made to eliminate the clusters before the disease spread into the general population.

The virus overseas appeared to have a slightly lower case fatality rate of between 3% and 7% but a slightly higher reproductive rate than was previously the case. The nature of the virus in New Zealand was not known at this time.

The exercise practised the implementation of public health controls to control and eliminate clusters, including the tracing, treatment and quarantine of contacts and closure of schools in affected areas.

6.2.3 Exercise Cruickshank Day Three
The scenario for Day Three of Exercise Cruickshank was that pandemic influenza had escaped control and started to spread to the general population.

District Health Boards established community-based assessment centres. National reserve supplies of antivirals were mobilized, and the community-based assessment centres were established for the assessment of possible cases and for dispensing antivirals and antibiotics.

Other agencies were focused on maintaining critical services, and directing or co-coordinating responses in their sectors or organizations. This included the education, civil defence, welfare, corrections, fast-moving consumer goods and critical infrastructure sectors.

6.2.4 Exercise Cruickshank Days Four and Five: the initial recovery phase
The scenario for Days Four and Five of Exercise Cruickshank was that the pandemic was on the wane.

Crèches, kindergartens, schools, colleges, universities, public libraries and video stores were reopened. More planes were flying, although international passenger traffic was at 20% of its normal level, and was expected to recover to normal levels only slowly. This has a continuing impact on trade, particularly imported supplies for industry, and tourism.

Power, water and sewerage services were maintained during much of this period, although outages were becoming more common because maintenance had been deferred.

Telephone, text and e-mail communication was heavy as people tried to keep in touch with each other.

The epidemiology of the disease in New Zealand was much the same as in other countries. All health services were badly affected. More and more health workers were returning to work, but normal health work continued to be hampered by shortages in critical supplies.

Given the uncertainties around the recovery phase, Day Four of the exercise consisted of 22 workshops exploring recovery issues, interdependencies and actions. Feedback from the workshops was pulled together and presented for further discussion at a national workshop.

6.3 WebEOC
As part of the Exercise Cruickshank planning and preparation phase, the Ministry of Health piloted the web-based emergency management software system WebEOC for testing communications and reporting within the health sector.
7. Evaluation
The Ministry of Health, in consultation with the Health Sector Advisory Group and the Intersectoral Advisory Group, developed exercise-specific objectives and performance indicators to measure the performance of exercise play during the exercise days. A suite of tools was developed to assist with the evaluation of exercise play against the objectives and performance indicators.

Results are based on feedback and comments received from participants, evaluators and facilitators through:
- participant and observer evaluation templates
- evaluator assessment reports
- debriefings.

The information collected during Exercise Cruickshank was evaluated and analysed using quantitative and qualitative processes. Judgement was used to draw conclusions and identify the cause of problems identified in the comments. The national Report on Exercise Cruickshank is available online.17

While Exercise Cruickshank was undertaken by a large number of agencies throughout the health and non-health sectors, the analysis in this section focuses on national trends or findings common to all exercise participants. Individual agencies had the responsibility to develop reports specific to their agency or organization and sector.

8. Lessons learnt
8.1 Preparation for and conduct of the exercise
Overall, the feedback on the role of exercise control (that is, the staff responsible for developing, managing, evaluating and documenting the exercise) before and during the exercise was positive. Figure 2 summarizes the feedback ratings from participants, and shows that more than 85% of participants agreed this was a well-planned and well-executed exercise that benefited the participating organizations.

8.2 Pandemic preparedness
Exercise Cruickshank was the largest exercise of its kind to be conducted in New Zealand. It successfully practised the four stages of a pandemic response across more than 40 government agencies at local, regional and national levels in New Zealand. It allowed many sectors to practise their roles in the response to this kind of event, and created improved emergency communication and network links between organizations.

8.2.1 Areas of strength
- Day One: Border management: The border management deployment exercise was successfully carried out.

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Day Two: Cluster control: The table-top deployment exercises carried out on Day Two demonstrated that cluster control operations could be initiated effectively across the health sector. Procedures in prisons and schools were successfully tested.

Day Three: Pandemic management: The setting up of community-based assessment centres was successfully practised in several District Health Boards. The exercise demonstrated that the health sector can establish and resource these facilities in a timely manner when required. Key critical infrastructure companies were engaged in order to test communication processes. Excellent liaison occurred between District Health Boards and civil defence groups in many areas.

Days Four and Five: Recovery: Representatives from many agencies attended workshops across the country to discuss the issues likely to arise during the recovery phase of a pandemic. The discussion workshops were well attended and there was an enthusiastic level of engagement from all participants. Issues were identified and suggestions were made about how to address the issues in the recovery plans for a pandemic situation. These are discussed in more detail in Section 5 of the report.

8.2.2 Key areas for improvement

Improve information collection and dissemination
Key issues that need to be addressed include:
• additional training for staff on how to complete a situation report and other reports;
• further development of WebEOC (web-based emergency management software) as a tool for collecting and disseminating information;
• stress testing of public information systems to deal with a large volume of requests (e.g. the Ministry of Health web site and telephone helplines);
• the development of integrated procedures for disseminating information to specific communities.

Improve agency emergency response procedures
Key issues that need to be addressed include:
• ongoing training on the coordinated incident management system for relevant staff, and fast-track orientation programmes for staff in emergency operation centres;
• clearer definition of the roles and responsibilities of different advisory or decision-making groups in a pandemic response;
• identification of generic single points of contact in each agency for emergencies in general.

Advance the progression of emergency-related legislation
Relevant agencies should prepare Orders in Council, as provided in section 11(1) of the Epidemic Preparedness Act 2006 and requested by Cabinet in October 2006, to modify existing legislation to enable greater flexibility during a pandemic emergency.

Advance planning for public health controls
The implementation of border and cluster control operations lies at the heart of the ‘keep it out’ and ‘stamp it out’ phases. Agencies successfully mounted such operations during the exercise, but this placed great pressure on resources, raising issues about the sustainability of operations over a longer period. However, public health services noted great improvements since Exercise Makgill, which tested the ‘stamp it out’ phase of a pandemic response.

Key issues that need to be addressed include:
• sharing lessons learnt to enhance local planning
• advancing the intersectoral border management work programme.

Advance planning for community-based assessment centres
Maintain the national working group in order to advance planning.

Advance planning within sectors
Many other agencies were actively engaged during the exercise. In general, the sectors most affected by a pandemic event would be those concerned with social, critical infrastructure and economic matters. These are the agencies that need to ensure they have effective and appropriate pandemic plans. Many agencies with an interest in social, economic, foreign affairs and trade issues took part in the exercise, in particular the policy discussion exercises, and now need to advance their pandemic planning within the context of emergency and business continuity planning as a whole.
1. Background
Niue is a New Zealand-associated Polynesian Pacific island nation, with a total population of 1,700. Most of its population now reside in New Zealand. There is only one health-care facility, the Niue Fou Hospital, on the island.

Under the leadership of Niue Health Department and, with technical assistance provided through the Pacific Regional Influenza Pandemic Preparedness Project (PRIPPP) under the Secretariat of the Pacific Community (SPC), Niue established a multisectoral pandemic taskforce and developed its first draft of the Niue Influenza Pandemic Preparedness Plan (NIPPP) in July 2006.

The NIPPP acts as an umbrella plan providing directives and guidance to different sectors (both health and non-health), nongovernmental organizations and communities as to who takes lead responsibility in preparedness and response to avian and pandemic influenza. It is anticipated that each sector will in time develop its own contingency pandemic preparedness plan. The NIPPP was prepared in accordance with WHO Pandemic Alert phases and was modified to local conditions.

As part of the NIPPP, the Government of Niue organized a functional exercise on 13 November 2007 to test the health sector response to a pandemic influenza event.

2. Objectives
2.1 General objectives
The exercise focused on using existing plans to develop a coordinated response to provide health-care services to those affected by pandemic influenza and those who had non-influenza medical conditions, based on resources anticipated to be available at the time.

This evaluation reviews the Community-Based Assessment Centre (CBAC) and influenza ward capability and competency based on the key performance indicators in the exercise outline. It does not attempt to evaluate the emergency coordination component (as that was tested during a cyclone response exercise in October 2007) but makes linkages with that component where relevant to the CBAC or influenza wards.

2.2 Specific objectives
The exercise tested components of the hospital emergency response plan, including reconfiguration of services to create a CBAC (during the one-day scenario), with the objectives to:

- establish and operationalize a CBAC to assess and triage patients, provide treatment with antiviral and other medications, and refer influenza patients for admission to Niue Fou Hospital;
- establish and assess functional separation of Niue Fou Hospital, including allocating separate staff to influenza wards and non-influenza wards, with no crossover during their shifts;
- assess communication between the hospital and the CBAC, patients and communities;
- increase public awareness of pandemic influenza and the use of the CBAC;
- assess the functions of the Niue International Health Regulations–National Focal Point (IHR–NFP);
- evaluate and identify gaps in order to improve preparedness and response planning.
3. Participating agencies and organizations

### Table 11

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<thead>
<tr>
<th>Participating agencies and organizations</th>
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<tr>
<td>Niue Health Department (lead)</td>
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<tr>
<td>Niue Influenza Pandemic Taskforce (NIPT)</td>
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<td>National Disaster Council</td>
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<td>Niue Police</td>
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<td>Community Affairs Department</td>
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<td>External Affairs Office</td>
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<tr>
<td>Faith-based organizations (two local churches)</td>
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<tr>
<td>Broadcasting Corporation of Niue</td>
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<tr>
<td>Pacific Regional Influenza Pandemic Preparedness Project (PRIPPP), Secretariat of the Pacific Community (SPC)</td>
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<tr>
<td>New Zealand Ministry of Health, Wellington</td>
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<td>World Health Organization, Samoa Office</td>
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Planning and communications during the process took place mainly between the Niue Ministry of Health, PRIPPP/SPC and the New Zealand Ministry of Health. The WHO Samoa Office provided initial inputs, and later joined as part of the evaluation team.

4. Type of exercise

Functional exercise.

5. Preparation for the exercise

Preparation for the implementation of the exercise was conducted through communication by e-mail and telephone and country visits from PRIPPP specialists and the New Zealand Ministry of Health.

A number of practical preparations were also necessary to facilitate the exercise, as outlined below.

5.1 CBAC requirements

- The Youth Centre was identified as the ideal place for the CBAC as it is not far from the hospital and has the appropriate facilities.
- Negotiations were carried out with relevant authorities, and agreement was signed.
- PPE and medical supplies, including medications, were put in place.
- A waiting room was set up with a television, pamphlets, masks and alcohol-based hand rub.
- The administration assistant was separated from incoming patients by a clear plastic screen, with medical records to be passed to the patients under a partition.
- Extra telephone lines were installed.
- A two-way radio system (‘walkie-talkie’) was borrowed from the police.
- Signboards were prepared (in Niuean and English) to guide people in the community to find the CBAC, as well as to assist in transporting patients from the CBAC to the influenza ward at the hospital.

5.2 Staffing and task requirements

- Staffing the CBAC required two nurses, a doctor, an administration assistant, a driver and a security officer.
- Staff will assess and manage or treat symptomatic and non-symptomatic members of the community who visit the CBAC.
- Management includes physical assessment and distribution of medicines, including antipyretics, antibiotics and antivirals, according to set criteria. Other medical supplies are sourced from the hospital but stored and distributed from the CBAC.
- Patients assessed and found to be very ill with influenza will be transferred to the influenza ward in Niue Fou Hospital (while normal medical care for urgent non-influenza cases will be carried out in the other wards of the hospital).
- The public will be kept informed about the unfolding influenza pandemic and the arrangements put in place to control it.

5.3 Ensuring that nurses are able to distribute prescription drugs

As antivirals and antibiotics are prescription drugs, and there is a high likelihood that there may not be a doctor as a member of the CBAC team, the nurses are to be given the authority through a standing order to distribute antivirals and other medications.

5.4 Development of forms to be used and piloted during the exercise

- A tool was developed to evaluate the CBAC and the overall exercise.
- A form was developed for patient assessment at the CBAC; it can be used as an admission form, with a copy sent or faxed to the Pandemic Operation Centre (POC).
- Criteria for antiviral administration and distribution were formulated.
- Information for simple home management of influenza patients was prepared.

5.5 Physical separation of the hospital

The layout of the hospital was studied to determine how it could be physically divided.

Two key areas of the hospital were separated: an influenza ward for infectious influenza patients, and a
5.6 Training and debriefing of participants
The staff of the CBAC team and other health-care workers were trained in infection control procedures, including use of PPE, application of proper handwashing procedures (such as use of alcohol-based hand rub) and non-pharmaceutical practices (such as maintaining 1 metre social distancing). This briefing was conducted prior to the exercise, so that everyone involved was aware of their roles and responsibilities during the exercise. The police, who were providing security-related measures, were also briefed on infection control procedures.

5.7 Invitation of observers
Some members of the taskforce were invited as observers. They included individuals from the External Affairs Office, the Community Affairs Department, local churches and the Broadcasting Corporation of Niue.

6. Conduct of the exercise
The exercise required role players to perform a range of tasks related to their emergency roles in response to the scenario (outlined below). Participants also had to take action within tight time constraints.

6.1 The scenario: lead-in events
The New Zealand IHR–NFP had advised WHO and Niue three weeks previously (25 October 2007) that confirmed cases of pandemic influenza had been found in a number of locations in New Zealand, and some of these cases had not undertaken any recent travel to affected areas, confirming that local transmission was occurring.

The Niue Government decided to stop all incoming air passengers immediately after receiving the notification from New Zealand. However, a full plane had arrived the day before. Though there were no sick passengers reported by the pilot and crew, and no one had been placed in quarantine, there were increasing concerns leading to some degree of panic among Niue Cabinet members and health and other relevant authorities.

During the previous three days there had been reports of people with influenza-like symptoms in five villages. Cases had so far been cared for by their families at home.

6.2 Sequence of events
- A nurse on the night shift at the hospital received a call at 07:05 from a family to say that they were bringing in a 30-year-old man who had been sick with influenza-like symptoms for a day but his condition had deteriorated rapidly and he was experiencing difficulty breathing. He had been one of the passengers on the last flight from Auckland before the border was closed.
- The nurse provided directions as to what they should do and where to take the patient (contact tracing was simulated only and had been ongoing).
- The Director of Health was informed and she called her core response team members to meet by 07:30.
- At 08:00 all staff were briefed in the hospital lobby and responsibilities were mapped out.
- The CBAC team left the hospital at 09:00 with all the necessary equipment to set up and operationalize the CBAC.
- At the same time, the police team that was tasked to ensure the security of the area was briefed and given a demonstration on use of PPE.
- At the CBAC the administrative clerk was installed behind a transparent plastic screen to document patients’ details.
- The CBAC team put on PPE and checked all materials carefully (forms, telephone, two-way radio, etc.) before attending to the first patients.
- The patients were provided with surgical masks and directed how to put them on, and were given information leaflets upon arrival at the CBAC.
- In total, the CBAC team assessed 12 symptomatic and non-symptomatic members of the community.
- The CBAC nurses prescribed antivirals to symptomatic patients (in line with pre-established criteria and a standing order issued by a doctor).
- The CBAC team also identified a number of patients seriously ill with influenza who were transferred by ambulance to Niue Foou Hospital.
• The hospital staff had to manage the admittance of serious influenza cases whilst the non-influenza ward continued to provide urgent non-influenza patient care delivered by separate health-care workers.
• Immediately following the implementation of the exercise a hot debriefing was held at the CBAC.

6.3 Press conference
A mock press conference was held prior to the end of the exercise at Fouu Hospital. A local media team from the Broadcasting Corporation of Niue interviewed the Exercise Director, Deputy Director, Chief of Police and the IHR–NFP. The purpose of the press conference was to tell the public about the ‘influenza outbreak’ on Niue and other contingency plans had the outbreak affected the whole island.

7. Evaluation
The exercise went very well, and participants, observers and evaluators were excited by the positive outcomes.
An evaluation tool was used, and feedback from observers and participants was collected during the hot debriefings to give some rating of the preparedness of the Niue health sector to respond to a pandemic event.

8. Lessons learnt
Though the evaluation gave Niue a rating of 85–90% on the preparedness of its health sector to respond to a WHO Pandemic Alert Phase 5 influenza outbreak, the collaboration with other sectors needs to be evaluated in conjunction with the health sector response. In addition, the 40% of staff who may be affected or infected, according to New Zealand modelling, were not taken into consideration in this exercise.

8.1 Preparation for and conduct of the exercise
The preparation for and conduct of the exercise went very well, according to participants, observers and evaluators. There were few identified gaps that need to be addressed. Health-care providers expressed more confidence in dealing with infection control issues (both pharmaceutical and non-pharmaceutical measures), managing highly infectious patients and understanding the limited role of antivirals.

The principle area of concern was communication:
• During the conduct of the exercise, the IHR–NFP needs to clarify his position, including what to communicate to WHO and other agencies and counterparts in other Pacific island countries and territories.
• Information on admitted patients should go directly from the CBAC to the influenza ward nurse, and not via the officer in the POC. This is mainly for reasons of confidentiality but also for improved continuity of patient clinical management and the urgency of the information.

The conduct of the exercise definitely increased public awareness of pandemic influenza issues, through the involvement of non-health participants, media briefings and attendance of community observers.
There was a recognized need for an awareness programme to follow on from the exercise using multimedia approaches.

8.2 Pandemic preparedness
Recommendations based on evaluation of the exercise include:
• CBAC policy should be enforced, and should be able to be activated within a short period of time. There should be a nationwide campaign to help people understand and accept the function of the CBAC in relation to the hospital in times of emergency.
• A standing order for distribution of antiviral and other prescription drugs should be issued as an emergency policy. Criteria for antiviral administration should be part of the hospital and CBAC operation plan.
• The POC, or incident room, can be established within the current infrastructure and used as a centre of operations for other services, such as infectious disease surveillance, to be activated accordingly when the need arises.
• The role of the IHR–NFP needs clarification, in terms of who is taking the lead role and responsibilities. A clear IHR communication form needs to be drafted.
• There is a need to develop infection control guidelines that address all infection control equipment, supplies, practices and procedures. A system should also be developed where use of PPE is monitored and enforced.
• Awareness programmes for avian and pandemic influenza threats need to be strengthened, incorporating other potential infectious disease outbreaks.
• There is a need for essential service sectors (health and non-health, including nongovernmental organizations) to develop their respective emergency response plans and incorporate them in the national emergency response plan.
• An improved whole-of-government response to pandemic influenza should be developed through a multisectoral exercise of similar type in the near future.
1. Background

Rapid containment (RC) is seen as a possible strategic tool to stop, or at least slow, the spread of pandemic influenza at the source of its emergence, to minimize global morbidity and mortality in the initial pandemic stage. The concept is based on the mathematical modelling of transmission patterns that might be seen near the start of a pandemic. These models suggest that an initial pandemic influenza outbreak might be contained by timely implementation of pharmaceutical and non-pharmaceutical interventions under certain conditions. The success of RC depends on several assumptions, such as the characteristics of a virus and whether it demonstrates the ability for sustained transmission among humans. It is also predicated on the existence of good rapid response capacity and an effective logistic system.

RC is an evolving concept and because an RC operation has never been conducted in a real situation in human history, the detailed operational components still require further discussion and elaboration. Since 2006, almost all Member States in the WHO Western Pacific Region have developed pandemic preparedness plans, but no country has yet developed a well-articulated operational plan specifically for RC.

To move forward with the development and articulation process for RC planning, two exercises were conducted in the WHO Western Pacific Region in 2007. First, a simulation exercise called PanStop 2007 was conducted on 2–3 April 2007. The exercise focused on evaluating the ability of various partners to work together in an RC operation in stockpile logistics. Second, a TTX called PanStop II 2007 was conducted in the Lao People’s Democratic Republic (Lao PDR) on 6 December 2007.

The Government of the Philippines developed a pandemic preparedness plan in 2006, but it contained little in the way of the operational aspects of RC. Therefore, the Government of the Philippines decided to conduct PanStop II 2008 on 5–6 March 2008 in collaboration with WHO, with the objectives described below.

2. Objectives

The overall objective of PanStop II 2008 was to assess the preparedness of the Philippines to implement an RC operation with the intention of stopping or slowing the spread of an emerging potential influenza pandemic.

The two-day exercise was designed to identify strengths and opportunities for improvement in planning activities for pandemic influenza and to gain a better understanding of operational capacity for the conduct of RC in the Philippines.

The objectives of Day One were:
• to assess capacity to conduct a timely risk assessment;
• to validate established decision-making processes;
• to verify established coordination and communication arrangements with all levels of health administration, and with WHO;
• to ensure understanding of procedures for mobilization of ASEAN stockpiles;
• to practise the development of and use of risk communications.

Objectives of Day Two were:
• to validate existing arrangements for requesting, releasing and managing the distribution and administration of antiviral medication for treatment and prophylaxis;
• to assess the national capacity to implement non-pharmaceutical interventions;

3. Participating agencies and organizations

<table>
<thead>
<tr>
<th>Table 12</th>
<th>Participating agencies and organizations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Day One</strong></td>
<td>Department of Health, central and regional level (Center for Health Development, Region 3 (CHD3)) as main players of the RC exercise</td>
</tr>
<tr>
<td></td>
<td>WHO Philippines Country Office and Regional Office for the Western Pacific as participants and exercise management team</td>
</tr>
<tr>
<td><strong>Day Two</strong></td>
<td>Department of Health</td>
</tr>
<tr>
<td></td>
<td>National Disaster Coordination Council</td>
</tr>
<tr>
<td></td>
<td>Department of National Defense</td>
</tr>
<tr>
<td></td>
<td>Department of Interior and Local Government</td>
</tr>
<tr>
<td></td>
<td>Philippine National Police</td>
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<tr>
<td></td>
<td>Department of Social Welfare and Development</td>
</tr>
<tr>
<td></td>
<td>Armed Forces of the Philippines</td>
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<tr>
<td></td>
<td>Philippine Information Agency</td>
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<tr>
<td></td>
<td>Department of Agriculture</td>
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<td></td>
<td>Department of Education</td>
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<td></td>
<td>Department of Trade and Industry</td>
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<tr>
<td></td>
<td>Department of Budget and Management</td>
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<tr>
<td></td>
<td>Ports Authority (Airport and Seaports)</td>
</tr>
<tr>
<td></td>
<td>Philippines National Red Cross</td>
</tr>
<tr>
<td></td>
<td>Department of Transportation and Communication</td>
</tr>
</tbody>
</table>

In addition, ASEAN Secretariat representatives and UNSIC participated as evaluators. No overseas observers were invited.

4. Type of exercise

The exercise took place over two days. Day One, 5 March 2008, was a modified functional exercise focused on risk assessment and the decision-making process prior to the launching of an RC strategy, involving exclusively the Department of Health and WHO. The exercise required an artificial compression of time (exercise time) such that eight hours of exercise time simulated eight days of real time. The flow of exercise activities was based on a master events list (MEL). Day Two, 6 March 2008, was a TTX. The TTX focused on the operationalization of the RC activities with the mobilization of the other Philippine Government agencies (including the Department of Health in coordination with the National Disaster Coordination Council) and WHO, based on their perceived roles and functions.

5. Preparation for the exercise

Several preparatory meetings were held with the Department of Health, CHD3 and WHO Regional Office for the Western Pacific to develop consensus on the scope, objectives and type of exercise, followed by a pre-exercise briefing on 3 March 2008 and on the day of exercise.

The epidemiological background and the epidemiological tree of cases upon which the scenario was based were carefully designed and developed by staff of WHO Regional Office for the Western Pacific. An exercise management team consisting of a controller, simulator and moderator was created at WHO Regional Office for the Western Pacific and the Department of Health to run the exercise and an evaluation team was tasked with documenting the activities of the exercise participants.

6. Conduct of the exercise

On Day One, eight hours of exercise time simulated activities over eight days. The exercise was conducted simultaneously in three venues: the Department of Health Command Post (DoH CP), established in the Malaria Network Room in the Department of Health; the National Epidemiological Center (NEC); and CHD3. The scenario depicted an outbreak of a potential pandemic strain of H5N1 avian influenza in a fictional municipality, ‘Pot snap’. The scenario allowed for the opportunity to contain the outbreak by utilizing stockpiles of antiviral medication and other non-pharmaceutical interventions. The exercise focused on the Department of Health and WHO decision-making process prior to the launching of an RC operation. During the exercise, a total of 19 injects were presented to the participants. Each inject was carefully presented to the relevant venue and additional ad hoc messages (approximately 10) were used to stimulate exercise play when necessary. The scenario and subsequent injects were discussed and responded to accordingly by the participants in each venue, which led to hundreds of e-mails and fax communications among the venues.

Day Two was a half-day TTX. This TTX was more of a discussion on the provided scenario among the participants, moderated by a facilitator. This exercise involved other Philippine Government agencies, as well as the Department of Health in coordination with the National Disaster Coordination Council and WHO. The scenario addressed the situation after a decision to launch RC had...
been made on Day One. It focused on the implementation of RC, coordination among government agencies in implementing pharmaceutical and non-pharmaceutical interventions, and risk communications.

7. Evaluation
The evaluation team consisted of three independent evaluators, who were positioned to monitor the conduct of the exercise and assess whether the exercise objectives were satisfactorily addressed in each venue on Day One. On Day Two, two evaluators monitored and evaluated the discussion among the participants. They were provided with an Evaluators’ Handbook and basic paper-based data collection tools for both days. Immediately following the exercise, participants, evaluators and controllers were debriefed to identify those aspects of the exercise experience that were most immediately memorable and significant. Based on the findings and discussions an After Action Report was developed and published. This report provides a distillation of the more important lessons learnt from the exercise.

8. Lessons learnt
The exercise facilitated the evaluation of existing processes and there were several valuable outcomes, which will assist in the development of an RC plan and the conduct of future exercises, as summarized in the official After Action Report. The feedback from most of the participants from the Department of Health on Day One indicated significant benefit from the exercise and most believed that it was an important means of improving preparedness for RC. Likewise, the TTX on Day Two presented the first opportunity for Philippine Government and nongovernmental agencies to consider the importance of an RC operation from a national perspective.
Republic of Korea

Flufighter

1. Background
The Government of the Republic of Korea has developed the Pandemic Influenza Preparedness and Response Plan, which consists of the following seven components:
1. command and control, coordination
2. risk communication
3. surveillance
4. medical services
5. vaccine and antivirals
6. public health measures
7. training and education, research.

To date, the government has conducted two major simulation exercises to test and revise the plan, on 31 March 2005 and on 11–12 October 2006. In addition, local pandemic influenza exercises took place in 2007. This section features the exercise that took place in October 2006.

2. Objectives
a. To improve the national crisis response capability:
   • to improve decision-making abilities of related officials in the central government and local authorities;
   • to help to make decisions on prioritizing distribution of limited medical resources;
   • to encourage local authorities to make prompt and proper responses in a competitive environment.

b. To protect national health and establish a social safety network:
   • to help the general public understand the response system for pandemic influenza;
   • to establish an international collaborative system for control of pandemic influenza.

3. Participating agencies and organizations

<table>
<thead>
<tr>
<th>Principal participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experts from the Ministry of Health and Welfare, and the Korea Centres for Disease Control and Prevention (KCDC)</td>
</tr>
<tr>
<td>Officials from 16 cities/provinces, 4 quarantine stations</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Related agencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government Information Agency</td>
</tr>
<tr>
<td>Ministry of Education and Human Resources Development</td>
</tr>
<tr>
<td>Ministry of Foreign Affairs and Trade</td>
</tr>
<tr>
<td>Ministry of National Defence</td>
</tr>
<tr>
<td>Ministry of Government Administration and Home Affairs</td>
</tr>
<tr>
<td>National Police Agency</td>
</tr>
<tr>
<td>National Emergency Management Agency</td>
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<tr>
<td>Ministry of Agriculture and Forestry</td>
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<tr>
<td>Ministry of Justice</td>
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<tr>
<td>Ministry of Environment</td>
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<tr>
<td>Ministry of Labour</td>
</tr>
<tr>
<td>Korea Coastguard</td>
</tr>
<tr>
<td>Office of National Security Council</td>
</tr>
<tr>
<td>Emergency Planning Commission</td>
</tr>
<tr>
<td>Korean Hospital Association</td>
</tr>
<tr>
<td>Korean Society of Preventive Medicine</td>
</tr>
<tr>
<td>National Intelligence Service</td>
</tr>
</tbody>
</table>

4. Type of exercise
Full-scale exercise (Functional exercise at national level combined with drills for rapid response teams).

5. Preparation of the exercise
The Minister of Health and Welfare and the Director of KCDC led the exercise as Supervisor and Vice-Supervisor,
respectively. The exercise organizational structure was mainly composed of a Planning and Control Unit and an Enforcement Unit. The former planned, prepared and controlled the exercise while the latter conducted the exercise and submitted response plans. The Planning and Control Unit consisted of a Control Team controlling the exercise, a Virus Team preparing scenarios and messages, and an Evaluation Team assessing response plans.

The Enforcement Unit was divided into the Central Crisis Control Committee, which provided measures on the central government level; a Response Team, composed of quarantine stations in 16 cities/provinces; and related agencies. The Emergency Response Team and the National Medical Centre in the Central Crisis Control Committee implemented on-site exercises.

**Figure 5** Exercise organizational structure

- **Exercise supervisor**
  - Minister of Health & Welfare
- **Exercise Vise-supervisor**
  - Director of KCDC
- **Planning & Control unit**
  - Evaluation team
  - Virus team
  - Control team
- **Enforcement unit**
  - Related agencies
- **Central Crisis Control Committee**
- **Response team**
  - National Medical Centre

A significant feature of this exercise was provision of a virtual environment close to the real world. Five ‘breaking news’ video clips were developed for viewing by the participants at the onset of every scenario to provide a realistic atmosphere and a sense of urgency. A mathematical model was used that could result in 1040 different outcomes in the number of patients and deaths, depending on how participants responded to a series of injects. Mock media interviews were used to test the performance of local public health professionals.

**7. Evaluation**

An evaluation committee was established to assess the performance of the participants. Process indicators were developed prior to the deployment, which could score the performance of participants on a scale of 0–5 for each action. Outcome indicators were also developed which consisted of the number of patients and deaths, based on mathematical modelling.

**8. Lessons learnt**

8.1 Preparation for and conduct of the exercise

The exercise revealed that it is essential for the planners to take a teamwork approach when they are preparing for a large-scale exercise. The planners must ensure an effective distribution of tasks throughout the whole process to develop the scenario and training guidelines, attract participants to the exercise and set up equipment and exercise sites. It is particularly important to secure administrative assistance, which could be key to the success of the exercise. If departments find it hard to tackle a task on their own, they must take a task-force approach.
It is also necessary to establish cooperation among different ministries in order to secure their help in conducting the exercise and to reflect their opinions in the exercise. It is also important to forge a team of experts in infectious diseases and preventive medicine who can provide technical input into the exercise design.

Participants’ ability to manage crisis situations was enhanced through new approaches introduced through exercise guidelines, reference materials and pre-exercise workshops. However, after the exercise it was clear that more should have been done to make these methods more concrete and detailed. Thus it was recommended to other departments preparing such crisis management exercises that they focus on how to improve the participants’ ability to manage crisis situations.

### 8.2 Pandemic preparedness

There is a need to develop manuals that identify ways to secure and distribute medical resources and define the roles of relevant agencies in the event of a pandemic. Also, priorities must be set to secure and use adequate medical resources.

The infrastructure for the initial response to an outbreak must be well established and should include rapid response teams, isolation facilities and mobilization of medical equipment for severe cases.

<table>
<thead>
<tr>
<th>Table 14 Exercise time-frame</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Day 1: October 11 (Wednesday)</strong></td>
</tr>
<tr>
<td><strong>Hours</strong></td>
</tr>
<tr>
<td>08:30–09:00</td>
</tr>
<tr>
<td>09:00–09:10</td>
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<tr>
<td>09:10–09:20</td>
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<tr>
<td>09:20–09:30</td>
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<td>09:30–10:30</td>
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<td>10:30–12:30</td>
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<tr>
<td>12:30–13:30</td>
</tr>
<tr>
<td>13:30–17:00</td>
</tr>
<tr>
<td>17:00–17:30</td>
</tr>
</tbody>
</table>
## Day 2: October 12 (Thursday)

<table>
<thead>
<tr>
<th>Hours</th>
<th>Required time</th>
<th>Stages</th>
<th>Other remarks</th>
<th>Detailed schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:00–09:30</td>
<td>30 min</td>
<td>Schedule introduction</td>
<td></td>
<td>Public notice &amp; transfer</td>
</tr>
<tr>
<td>09:30–12:30</td>
<td>3 hours</td>
<td>Situation phase 4</td>
<td>National medical center</td>
<td>09:20–09:30 Video data &amp; situation description (10 min)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Onsite exercise</td>
<td>09:30–12:30 Situation 4 exercise (180 min)</td>
</tr>
<tr>
<td>12:30–13:30</td>
<td>1 hour</td>
<td>Lunch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13:30–15:30</td>
<td>2 hours</td>
<td>Situation phase 5</td>
<td></td>
<td>13:30–13:40 Video data &amp; situation description (10 min)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>13:40–15:30 Situation 5 exercise (110 min)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>14:00–14:10 Video conference</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>(National medical center director – KCDC head)</td>
</tr>
<tr>
<td>15:30–16:00</td>
<td>30 min</td>
<td>Break &amp; preparation</td>
<td></td>
<td>Transfer &amp; break</td>
</tr>
<tr>
<td>16:00–17:30</td>
<td>1 hour 30 min</td>
<td>General discussions</td>
<td></td>
<td>Final evaluation</td>
</tr>
</tbody>
</table>
**Singapore**

*Exercise SparrowHawk I (2006), Exercise SparrowHawk II (2006) and Exercise SparrowHawk I (2008)*

1. Background
The Government of Singapore has developed a national influenza pandemic plan which incorporates preparedness and response plans and standard operating procedures (SOPs). To put the plan into practice, the government has conducted individual-, functional-, institutional- and system-level training, and has undertaken infrastructure development and stockpiling of drugs, such as antivirals. As part of the overall national effort to gear up the response plans and ensure the readiness of the health-care system to combat a possible influenza pandemic, a two-stage exercise codenamed *Exercise SparrowHawk I (2006)* and *Exercise SparrowHawk II (2006)* was conducted from April to June 2006, and from 21 to 22 July 2006 respectively.

2. Objectives
The overall objectives of the exercise were:
- to test and validate the influenza pandemic readiness and response plans of critical government agencies and health-care institutions;
- to assist the various health-care institutions to develop their own readiness capabilities;
- to serve as a platform to launch a public campaign to raise public vigilance and confidence.

The specific objectives of the two exercises were:
- *Exercise SparrowHawk I (2006)*: to validate the influenza pandemic response plans of the acute-care public and private hospitals, in particular their ability to manage an outbreak of influenza cases in their wards in a pre-pandemic setting;
- *Exercise SparrowHawk II (2006)*: (a) to exercise system-level integration involving part or the whole of critical components, i.e. Ministry of Health headquarters, selected hospitals, polyclinics, general practitioners, nursing homes and key ministries and agencies, especially border health; (b) to practise the critical components of the influenza pandemic medical response plan, namely the management of imported cases and close contacts; health-care institutions’ infection control measures and case management; and the operation of influenza clinics; and (c) to build up public awareness and confidence in the country’s influenza response plans and measures.

3. Participating agencies and organizations
Over 1000 personnel from 21 home-front and related agencies were involved.

<table>
<thead>
<tr>
<th>Principal participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Health</td>
</tr>
<tr>
<td>Ministry of Education</td>
</tr>
<tr>
<td>Civil Aviation Authority of Singapore (CAAS)</td>
</tr>
<tr>
<td>Immigration and Checkpoints Authority (ICA)</td>
</tr>
<tr>
<td>Maritime and Port Authority (MPA) of Singapore</td>
</tr>
<tr>
<td>People’s Association</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Locations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changi Airport Terminal 2</td>
</tr>
<tr>
<td>Tuas Land Checkpoint</td>
</tr>
<tr>
<td>Tanah Merah Ferry Terminal</td>
</tr>
<tr>
<td>7 public hospitals and 5 private hospitals</td>
</tr>
<tr>
<td>Pasir Ris Polyclinic and Bukit Batok Polyclinic</td>
</tr>
<tr>
<td>4 Parkway Shenton general practitioner (GP) clinics</td>
</tr>
<tr>
<td>Greenview Secondary School and Yuhua Primary School</td>
</tr>
</tbody>
</table>

4. Type of exercise

5. Preparation for the exercise

5.1 Planning
This involved completing and publicizing the national pandemic influenza plan prior to the exercise. In addition to the medical response component, the plan emphasized the concurrent whole-of-government response with focus on continuity of essential services and
5.2 Training
This involved conducting individual-level training (e.g. PPE use); institutional-level training (i.e. completion of Exercise SparrowHawk I (2006) in preparation for Exercise SparrowHawk II (2006)); functional-level training (e.g. contact tracing, serving home quarantine orders, border health exercises); and a system-level TTX to examine policy issues.

5.3 Public communication
As 2006 was the first time that the Ministry of Health was exercising its influenza pandemic response plan, the Ministry used the exercise to generate greater public awareness and to drill home the message that the nation was prepared to deal with a potential influenza pandemic holistically. The messaging also sought to enlist the cooperation of the public to keep the disease at bay or slow down its spread by being personally and socially responsible (for example by practising good personal hygiene habits and following health advisories from the authorities).21 A Flu Pandemic Business Continuity Guide to Small and Medium Size Enterprises (SMEs) was also produced.

6. Conduct of the exercise
The ‘live’ components of Exercise SparrowHawk I and II (2006) each lasted approximately 24 hours, and saw the hospitals’ key management and staff managing the outbreak of the first influenza cases in their wards and emergency departments. The exercises were conducted within a week of the completion of the respective TTXs. The Ministry of Health’s Exercise Management Staff (EMS) arrived at the designated hospital in the morning to initiate and observe the exercise. The following processes were exercised:

- Case management and infection control: To test the hospital’s management of suspected influenza cases, especially at a low level of alert (i.e. WHO 1 to 4), simulated cases of human infection with avian influenza were ‘triggered’ at the hospital’s emergency department and within the wards, resulting in an influenza cluster. The hospital then implemented its case management procedure and infection control in accordance with its influenza response and readiness plan.
- Epidemiological investigation and contact tracing: In parallel, the hospital contact tracing team was activated in response to the cases. The team needed approximately 24 hours to conduct epidemiological investigation and contact tracing and to prepare an activity map of the cases, including lists of close/remote contacts of the index cases.

For Exercise SparrowHawk II (2006), the Ministry of Health centrally coordinated the multi-agency exercise, while at the same time allowing individual participating institutions decentralized control over their own respective exercises. The Ministry of Health maintained command and control of the various exercises by deploying its EMS during the exercises. The exercise tested and fine-tuned the Influenza Pandemic Readiness Response Plan at various levels among key government agencies as well as public and private health-care institutions. Some of the key activities included the management of imported cases and close contacts at checkpoints; health-care institutions’ infection control measures and case management as part of the continuum of care with patients managed at the right site; and the operation of polyclinics and GP clinics as influenza clinics. The exercise also tested procedures for triaging of patients; registration and temperature screening of visitors at hospitals and polyclinics; isolation of suspected cases; and treatment and transfer of patients. The entire two-day exercise was scripted so that there were no surprises to participating institutions and agencies.

To inject realism into the exercise, a surge of influenza patients was simulated at participating polyclinics and...
GP clinics that necessitated the set-up of influenza clinics to manage the increased patient load. About 500 community volunteers played the role of the influenza patients and close contacts at the polyclinics and air/land checkpoints. Additional volunteers from a local university also participated in the checkpoint exercises.

During the exercise, there was imposition of temperature screening and visitor movement restriction and registration at the participating hospitals. The public was involved so that they could experience at first hand the impact of a pandemic. The public was informed of the influenza pandemic exercise through a series of pre-exercise announcements and alerts by the different health-care institutions.

Foreign observers from the Asia-Pacific region, including from Hong Kong, Australia and Malaysia, were invited to the exercise so that they could share their experiences, benefit from the cross-learning and deepen ties.

7. Evaluation
The 2006 SparrowHawk series was successful in meeting its established objectives on case management, infection control, and contact tracing. Besides serving as a training opportunity, the exercises provided the Ministry of Health with the opportunity to assess the influenza pandemic readiness of the health-care sector and identify gaps in the procedures and plans. Following the exercises, the Ministry of Health received useful and constructive feedback on its policies and guidelines.

In 2008, a second series of disease outbreak management exercises was embarked on with each of the six acute-care public hospitals. The first exercise was conducted on 10 March 2008, and the last on 15 May 2008.

The objective of Exercise SparrowHawk I (2008) was to determine the readiness level of the acute-care public hospitals in their immediate response to suspected human infections with avian influenza in a pre-pandemic setting, with special focus on the Ministry of Health’s newly introduced Infection Control Response Team (ICRT) concept.

Exercise SparrowHawk I (2008) was a TTX and full-scale exercise. It was conducted in a manner similar to Exercise SparrowHawk I (2006), with the major difference being that the exercises were activated unannounced to inject greater realism. The Ministry of Health EMS turned up without prior notification at the general ward of the exercise hospital and ‘triggered’ the simulated case of human infection with avian influenza.

Prior to the 2008 series of exercises, the Ministry of Health felt that there was a need to develop a more structured and objective evaluation tool to determine the readiness level of the hospital in disease outbreak management. With a proper evaluation tool, the Ministry of Health could determine a Readiness Key Performance Indicator that the hospitals should meet.

Culling from existing literature and SOPs, and from the lessons learnt from the 2006 exercises, the Ministry of Health collaborated with the public hospitals to develop an evaluation system based on the Disease Outbreak Response Management – Best Practice Guidelines (BPG) (see Figure 7.), to facilitate and enhance the quality of observations made on the ground by the evaluators, and to enhance the quality of assessment. The BPG are a collection of statements that spell out the requirements for processes and activities that are deemed necessary (‘must have’) or good practice (‘good to have’) in order for the system to function effectively. Weightings are given to different practices depending on their relative importance. For the 2008 exercises, BPG were used for the Infection Control Response Team (ICRT) management, infection control practices in the infected ward and isolation ward, and system of investigation and contact tracing.

The pre-defined evaluation methodology made evaluation much easier, more focused and more transparent. There was a great deal of engagement with the public hospitals to jointly develop the tool. The transparency of the tool made after-exercise-review discussions with the hospitals easier because the hospitals knew beforehand which processes and activities would be assessed. The evaluators consisted of public health experts from the Ministry of Health and clinicians from the public hospitals themselves, thus increasing the credibility of the evaluation process.

8. Lessons learnt
The lessons learnt from the 2006 exercises were:
- A high level of readiness is not sustainable amongst all health-care staff. Rather, institutions need to have a designated response team to manage the 'first
case(s)’ while the institution ramps up to meet the increased demands. This has since been addressed under the ICRT concept. 

- Proper build-up to an exercise is necessary to secure its full benefits.
- Early engagement of the participating agencies creates greater commitment on their part to the exercise.
- Proper media and publicity planning from pre- to post-exercise is necessary to ensure the maximum effect intended for publicity objectives.
- Involvement of senior political leaders is important in emphasizing the message of public preparedness, and highlighting that an influenza pandemic is not just a health problem.

**Figure 7** Singapore Disease Outbreak Response Management – Best Practice Guidelines (BPG)
1. Background
The Royal Thai Government has been promoting pandemic preparedness based on the National Strategic Plan for Influenza Pandemic Preparedness 2005–2007, which has been revised and extended to cover the activities for the period of 2008–2010. It underlines the importance of multisectoral engagement, multi-level interventions and international cooperation, and highlights the value of conducting exercises. To put the plan into more practical use, it has been translated into operational plans for concerned agencies at central, provincial and local levels, and has been tested through a series of TTXs. During 2006–07, the Ministry of Public Health supervised TTXs on provincial pandemic preparedness plans in all 76 provinces, and coordinated similar exercises for all of its departments. This section features simulation exercises that have taken place at the provincial level in Thailand.

2. Objectives
The objective of Thailand’s exercise regime is to test capacity in early detection and containment of an outbreak of pandemic influenza.

The Table-top Exercise on Influenza Pandemic Preparedness at the Provincial Level
• was a planned series of exercises to test:
• awareness of the concerned provincial authorities of the risk of an influenza pandemic and of their roles in the preparedness for pandemic prevention and response;
• level of pandemic preparedness of concerned provincial authorities;
• pandemic preparedness plans of concerned provincial authorities;
• coordination mechanisms among different sectors in the province.

3. Participating agencies and organizations

<table>
<thead>
<tr>
<th>Agencies and organizations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Public Health (all departments)</td>
</tr>
<tr>
<td>Ministry of Agriculture and Cooperatives (Department of Livestock Development)</td>
</tr>
<tr>
<td>Ministry of Interior (Department of Disaster Prevention and Mitigation, Department of Local Administration Promotion)</td>
</tr>
<tr>
<td>National Police Department</td>
</tr>
<tr>
<td>National Public Relations Department</td>
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<tr>
<td>Ministry of Education</td>
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<tr>
<td>Ministry of Defence</td>
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<td>Ministry of Labour</td>
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<tr>
<td>Ministry of Commerce</td>
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<tr>
<td>Ministry of Transport</td>
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<tr>
<td>National Office of Finance</td>
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<tr>
<td>Waterworks Authority</td>
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<tr>
<td>Electricity Authority</td>
</tr>
<tr>
<td>Thai Red Cross Society</td>
</tr>
<tr>
<td>Mass media</td>
</tr>
<tr>
<td>Community leaders</td>
</tr>
<tr>
<td>Volunteers (livestock, health, education, community development)</td>
</tr>
</tbody>
</table>

4. Type of exercise
TTX.

5. Preparation for the exercise
A kit containing multiple scenarios, the Guidelines for Conducting Table-top Exercises, was developed and distributed to provincial officials to assist in conducting exercises. The kit includes:
• Guidelines for Table-top Exercise on Influenza Pandemic Preparedness at the Provincial Level for Organizers and Facilitators, 2006;
6. Conduct of the exercise

Participants were divided into the following six groups:
- Surveillance and Control
- Logistics and Supply
- Emergency Response – Medical Services
- Emergency Response – Community
- Public Communications
- Integrated Coordination and Command

Each group had to respond under eight evolving scenarios (five scenarios relating to human-to-human transmission of H5N1 in one province, and three scenarios in which outbreaks spread nationally and globally).

7. Evaluation

The Ministry of Public Health invited observers to each group to provide feedback on the exercise. The observers paid particular attention to:
- the clarity of roles and responsibilities of each agency
- coordination and communication between agencies
- existing response protocols
- strengths and weaknesses of the actions taken
- gaps between planning and actual actions
- any other issues for improvement in preparedness.

8. Lessons learnt

A number of lessons have been learnt:
- Provinces that have conducted a TTX have found that they can utilize the skills and plans they have practised when there have been outbreaks of other diseases, such as dengue.
- The cross-departmental approach was important in developing a more complete package than the Ministry of Public Health could have prepared working alone.
- The exercises have provided valuable feedback for the provinces on their preparedness. In the first year of exercises provinces only had response plans, but are now moving to a practical level of preparedness.
- The scenarios were designed to run over three days, including introductions and discussions, but have generally been implemented in two days because of resource constraints.
- Providing a clear curriculum has increased the volume of exercises conducted because Ministry of Public Health staff only have to support the provincial staff.
1. Background
Viet Nam was among the first countries in Asia to report human infections with H5N1 avian influenza and remains the worst affected in terms of numbers of human infections. By the end of February 2008, the national surveillance system has recorded 105 confirmed human cases and 51 deaths, giving a case fatality rate of 49%. Almost all human cases and deaths were of children or young people under 18 years of age. Since the H5N1 virus is still in circulation and a huge number of households are engaged in poultry production, there is an ongoing risk of an influenza pandemic. Accordingly, the Ministry of Health has prepared an overall national action plan for influenza pandemic prevention and control, in which simulation exercises feature prominently.

Simulation exercises have been implemented in five provinces. All of them have made considerable achievements. One of the most successful simulation exercises is the one that took place in Hanoi, the capital city of Viet Nam, in 2005, which will be discussed in this section.

Conduct of this exercise was indispensable in helping to strengthen capacity at all levels, in order to respond rapidly to an influenza pandemic.

2. Objectives
The objectives of the simulation exercises are:
• to enhance coordination mechanisms among different agencies, particularly in the human and animal health sectors;
• to strengthen the capacity of health staff, in terms of early warning and rapid response to the first case of human infection with H5N1 avian influenza;
• to practise prevention and control measures for hospitals and household environments based on predicted scenarios.

3. Participating agencies and organizations

<table>
<thead>
<tr>
<th>Agencies and organizations</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Administration of Preventive Medicine and Environmental Health, Ministry of Health</td>
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<tr>
<td>National Institute of Hygiene and Epidemiology</td>
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<tr>
<td>Hanoi Health Services</td>
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<tr>
<td>Hospitals Hanoi</td>
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<tr>
<td>Hanoi Centre for Preventive Medicine</td>
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<tr>
<td>District Health Centres for Preventive Medicine, Hanoi</td>
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<tr>
<td>Military Board for Preventive Medicine</td>
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<tr>
<td>Police Board for Preventive Medicine</td>
</tr>
<tr>
<td>National and provincial mass media</td>
</tr>
</tbody>
</table>

4. Type of exercise
Full-scale exercise (functional exercise from provincial to district level, practised in hospitals and households).

5. Preparation of the exercise
A preparation team was set up, including staff from different relevant agencies. Guidelines on the simulation exercise were sent to the team. Several meetings were organized to develop scenarios for the exercise. The material for scenarios was submitted to and approved by relevant local authorities. A detailed budget plan was made for each exercise activity. Human resources, equipment and materials were mobilized, and the scenarios were tested before the main exercise. About 900 people were mobilized, accounting for more than 2000 working days.

6. Conduct of the exercise
The simulation exercise took place over a three-hour period. Prepared scenarios were sent to the various teams. The scenario featured a localized outbreak of H5N1 avian influenza in one district of Hanoi, in which the virus mutated to transmit from human to human.

An extraordinary meeting of the City Steering Committee for human infection with H5N1 avian influenza was convened, chaired by the vice-president of the Hanoi People’s Committee. Following a report on the
situation from a representative of the Surveillance Unit, other relevant units, such as Agriculture, Finance, Police, Transportation, Labour, Disabled and Social, reported on their preparedness and plans for the situation. Finally, the chair ordered the rapid response teams into the field to investigate and manage the situation, set up a temporary hospital in a school and upgrade a general hospital to function as an influenza hospital.

Three rapid response teams were sent into the field where cases of H5N1 were reported. The teams quickly deployed essential measures such as interviewing people, examining patients, taking samples and managing the situation. Infected households were disinfected with Chloramin B. The family of patients and close contacts were given oseltamivir as a prophylaxis. Patients were classified either to be transferred to hospitals or to be followed up in community. A restricted zone was established and local police were deployed to stop people moving in and out of the area. Messages and leaflets about influenza prevention were delivered to people in the affected area.

At the temporary hospital, which was set up in a school, patients were treated by a regimen guided by the Ministry of Health. Health staff from various different hospitals were mobilized to work in the temporary hospital. Vehicles were disinfected after bringing patients to the hospital. A general hospital was upgraded to function as an influenza hospital, which was made available to treat severe cases. Advanced equipment, materials and drugs were mobilized for use at the hospital, such as ventilators, PPE, oseltamivir and disinfectant. Waste disposal and handling of the bodies of the deceased were conducted appropriately.

7. Evaluation
The exercise was implemented successfully. Health staff had the opportunity to experience a potentially real scenario and members of the city steering committee had the chance to identify gaps and potential problems in preventing and controlling an influenza pandemic.

8. Lesson learnt
• The city authorities demonstrated the highest commitment to the simulation exercise, assisting the City Steering Committee in mobilizing the necessary resources for the exercise as well as facilitating exercise implementation.
• There was a good level of collaboration among different agencies, such as human and animal health sectors, the financial sector, police, military and others.
• Although health staff gained valuable experience during the severe acute respiratory syndrome (SARS) outbreak, conduct of this exercise was indispensable in helping to strengthen capacity at all levels, in order to respond rapidly to an influenza pandemic.
1. Background
Since the first outbreaks of human infection with H5N1 avian influenza in 2003, Asia-Pacific Economic Cooperation (APEC)24 has recognized the immense human and economic costs of an influenza pandemic, and has taken steps to ensure APEC economies are prepared for this threat. At the Leaders’ Meeting held in Busan, Republic of Korea, in November 2005, APEC leaders endorsed the APEC Initiative on Preparing for and Mitigating an Influenza Pandemic (APEC Initiative).25 The APEC Initiative identified 11 areas for collective work by APEC economies to complement and support the efforts of regional and international organizations, one of which was “to encourage testing of multisectoral pandemic preparedness, beginning with a regional desk-top simulation exercise in early 2006 to test the effectiveness of regional communication networks on avian and pandemic influenza outbreaks.” In response to this Leaders’ commitment, APEC Member Economies conducted a simulation exercise to test regional responses and communication networks in the event of an influenza pandemic over a two-day period from 7 to 8 June 2006, coordinated and funded by Australia with Singapore acting as co-facilitator.

2. Objectives
Unlike other exercises of this kind, which are used to test and refine existing systems and mechanisms, a unique feature of this exercise was that in developing and preparing for it, the mechanisms and regional communication networks themselves were actually being established. More specifically, the exercise aimed to:
- model an influenza pandemic onset scenario;
- test networks for sharing information and providing regional assistance;
- test the provision of advice to bordering economies and regional partners;
- confirm a list of principal authorities responsible for disaster response;
- test international communication arrangements between APEC economies;
- test the robustness of emergency management communications between APEC economies;
- enable respondents to participate from their own offices and in their own time zones;
- operate within existing APEC and relevant international communications arrangements (particularly WHO);
- identify successes and areas for improvement.

And the exercise did NOT set out to:
- test agricultural/animal health aspects of any pandemic;
- test domestic pandemic policies and responses;
- test domestic decision-making processes on issues such as vaccine distribution, deployment of experts and/or repatriation of citizens from overseas;
- test risk communications strategies within economies;
- have respondents operating in real time.

3. Participating agencies and organizations
All 21 APEC Member Economies joined the exercise either as primary or secondary participants. In addition, a number of international health organizations and regional forums, including the United Nations, WHO, the Pacific Islands Forum, ASEAN Secretariat and APEC Secretariat and non-APEC ASEAN countries (Cambodia, the Lao People’s Democratic Republic and Myanmar) also participated as observers. The Australian agencies coordinating the exercise were the Department of Foreign Affairs and Trade and Emergency Management Australia (EMA).

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24 APEC was established in 1989 to further enhance economic growth and prosperity for the region and to strengthen the Asia-Pacific community in three key areas: trade and investment liberalization, business facilitation, and economic and technical cooperation. It consists of 21 Member Economies (Australia, Brunei Darussalam, Canada, Chile, the People’s Republic of China, Hong Kong China, Indonesia, Japan, Malaysia, Mexico, New Zealand, Papua New Guinea, Peru, the Philippines, the Republic of Korea, Russia, Singapore, Chinese Taipei, Thailand, the United States and Viet Nam), which in total account for approximately 40% of the world’s population, approximately 56% of world GDP and about 48% of world trade.

4. Type of exercise
The exercise took the form of a functional exercise, in which exercise participants in all economies worked from their designated operations centres or their normal work areas – whichever location they would use in the event of an authentic pandemic. Given that APEC economies traverse eight time zones and that this was a developmental exercise, the economies participated in their own working hours rather than simultaneously, as could be expected in the case of an authentic emergency.

5. Preparation for the exercise
The exercise was prepared and managed through a centralized Exercise Coordination Centre (ECC) in Canberra, Australia. A pre-exercise briefing session took place during the Health Task Force meeting in Da Nang, Viet Nam, in May 2006.

6. Conduct of the exercise
The exercise took place in an operational environment and participants were required to make decisions based on the exercise scenario and other inputs provided progressively by the ECC and to ensure that these decisions and other relevant developments were dealt with domestically and responses communicated to the ECC.

In addition to providing participants with the exercise scenario and other inputs, the ECC acted as a central coordinating and relay point for all messages. This facilitated contact among exercise participants over a range of time zones and provided an overview of the effectiveness of regional communication networks.

The ECC contacted each economy prior to the exercise to check communication systems by making and receiving a phone call, sending and receiving an e-mail and sending and receiving a fax.

Exercise play commenced at 07:00 on 7 June 2006 with the first call to Wellington, New Zealand, and terminated at 08:00 on 8 June 2006 with the last call to Washington, DC, United States of America.

The scenario envisaged an outbreak of human-to-human H5N1 influenza over a 28-day period.

The first inject of the scenario advised economies that WHO had upgraded from Phase 4 to Phase 5 (larger clusters but human-to-human spread still localized, suggesting that the virus is becoming increasingly better adapted to humans, but may not yet be fully transmissible (substantial pandemic risk)).

Other scenario events included a warehouse that manufactured PPE burning down; teams from some economies already en route to an APEC youth football tournament in Viet Nam; backpackers from a number of economies suspected to have been in the infected area; and cruise ships picking up fishers and having influenza-like symptoms develop aboard.

The observers were kept abreast of developments through four-hourly situation reports (sitreps), which were also uploaded to the APEC internal web site.

For a time-line of exercise play see Figure 8.

7. Evaluation
After the exercise was terminated, exercise evaluation templates were completed by participants and observers. A post-exercise workshop also took place on 14–15 August 2006 in Singapore to debrief participants and to discuss outcomes. A final outcome report was published and has been shared widely.26

Despite some minor problems, all injects were sent and responses were generally made within acceptable time-lines.

8. Lessons learnt
The exercise was highly successful with positive engagement by all 21 APEC economies, reflecting their commitment to collaboration and cooperation, and their recognition of the serious consequences for the region of an influenza pandemic. Despite some minor problems establishing or maintaining contact between the ECC and some economies, all injects were sent and responses were generally made within acceptable time-lines.

Through their evaluations, participants provided very positive reviews of the exercise.

8.1 Preparation for and conduct of the exercise
Participants believed that the exercise provided an excellent opportunity to establish and test a communications network and to develop relationships between economies.

They indicated that the information provided was of a high quality and that the exercise scenario and injects worked well. Receiving information in advance was appreciated, while last-minute changes to documentation were not helpful.

Participants agreed that communication contact names, numbers and addresses should be up to date

**Figure 8 Exercise time-line**

**Exercise timeline**

**Scenario:** Major outbreak of ‘Straits Flu’
WHO upgrades alert status

**Exercise Coordination Centre (ECC) Canberra online**

**Scenario:** Fire destroys major personal protective equipment (PPE) producing plant in region

**Scenario:** Fishermen rescued by passenger ship—flu outbreak among passengers

**Scenario re-starts in The Russian Federation timezone**
EXERCISE INPUT MESSAGE
Input number 54
Time and date 2:30pm 7 June AEST
From Captain of the cruise ship Emerald Dream
To Japan
Subject Medical support at next port of call for cruise ship Emerald Dream

Input message
I am concerned that some of my passengers and crew may have been exposed to Straits Flu. There are currently fifteen severe cases of influenza-like illness on board. According to the ship's doctor, two patients are seriously ill and require ventilation that cannot be provided on board. I expect to arrive in Osaka within 48 hours and request permission to transfer the passengers to hospital on making port at Osaka.
and contacts should be available 24 hours a day, seven days a week.

The exercise also demonstrated the need for stable and reliable communication technology to be available throughout all APEC economies to deal with the communication demands of an influenza pandemic.

Most economies made connections between the exercise and their own domestic planning and found the exercise a valuable opportunity to test the robustness of their own planning. A number of economies also noted that it allowed them to test how well their domestic influenza pandemic plans linked with other economies’ plans when a regional response was required by the exercise.

A number of participants were of the view that having used the exercise to test their domestic plans, they would welcome the opportunity to share experiences, information, plans and approaches to improve their own planning.

The exercise showed that domestic communication and contact arrangements varied between economies and that one size did not fit all. It also showed that the variability in economies’ domestic arrangements did not hinder the exercise in any way.

The participation of observers was also a positive demonstration of APEC’s understanding of its role in this arena, and that APEC is seeking to complement, not duplicate, functions of other international organizations such as WHO.

Following the exercise, participants have identified a range of areas for future work and possible capacity building across the region.

Participants offered strong support for a future exercise, which they suggested should take place in real time to more fully test the communication network and regional approaches. Some also suggested that individual economies might want to undertake their own exercises to develop more integrated approaches domestically.

Participants felt strongly that communication technology tests should be conducted more than once in all economies prior to commencement of a future exercise and that as many economies as possible should be involved in the development and design of future exercises.

In any future exercise participants recommended that contact between economies be encouraged and that a system could be developed to enable participants to observe responses and developments throughout the exercise. Participants said that sharing of updates and progress reports between economies would be welcomed.

It was suggested that the lead time for planning of a future exercise could be longer than that available for this exercise.

8.2 Pandemic preparedness

Participants strongly supported the establishment of regional communication protocols and a regional communication network to deal with an influenza pandemic or other mass casualty event. While recognizing some of the limitations around maintenance, a majority of economies identified the need for an APEC communications contact list.

Many economies were also keen to have a range of opportunities for regular networking and relationship-building between economies, which would enhance bilateral relationships and possibly overcome some of the limitations of a contact list.

The exercise showed there may be some value in APEC considering establishing some form of enabling function or facility around mass casualty communication.

The practical nature of the exercise also helped identify a range of actions that could be developed in other areas (e.g. integrated planning) to enhance APEC’s preparedness for an influenza pandemic.
1. Background
Mekong Basin Disease Surveillance (MBDS) is a network of six Mekong countries (Cambodia, China (Yunnan Province), the Lao People’s Democratic Republic, Myanmar, Thailand and Viet Nam) which since 2001 has been collaborating successfully in disease surveillance and outbreak response and control. The partnership was reinforced in May 2007 through renewal of the memorandum of understanding among health ministers in the six countries. The collaboration provides a neutral mechanism for information exchange and joint response between countries with different political structures. It encourages sharing of information and strengthens disease surveillance and response to outbreaks of priority diseases such as avian influenza and dengue haemorrhagic fever.27

As one of the capacity building and network enhancement activities, MBDS conducted a number of pandemic influenza TTX, first in each member country in late 2006 and at the regional level on 13–14 March 2007 in Siem Reap, Cambodia. This section features the regional TTX.

2. Objectives
The objectives of the regional TTX was:
• to explore regional and cross-border responses to selected aspects of an evolving pandemic emergency;
• to identify priority actions to further improve preparedness and response;
• to develop recommendations to help guide future MBDS programming and donor investments.

3. Participating agencies and organizations
Fifty-nine national and provincial government officials from a broad range of sectors (including public health, agriculture, foreign affairs, defence and finance) in the six MBDS member countries took part. The exercise was also observed by 18 observers.

4. Type of exercise
TTX.

5. Preparation for the exercise
The exercise was designed and facilitated primarily by a team of consultants from RAND Corporation with inputs from member countries as well as from other relevant stakeholders.

Prior to the regional exercise, the following one-day country-level TTXs took place, convening single country participants:

25 August 2006 .......... Mukdahan, Thailand
5 September 2006 ....... Phnom Penh, Cambodia
26 September 2006 ...... Yunnan, China
10 October 2006 ........ Vientiane, Lao People’s Democratic Republic
16 October 2006 ........ Yangon, Myanmar
19 October 2006 ........ Hanoi, Viet Nam

An orientation meeting prior to the regional exercise took place on 12 March 2007 with participation of MBDS country team leaders and partner organization representatives. The orientation meeting was designed to familiarize MBDS country leaders with the exercise content and procedures, review and make final revisions to the exercise and prepare the exercise facilitators to lead designated group discussions.

27 For more details about MBDS, please see MBDS web site (http://mbdsoffice.com, accessed 25 August 2008).
6. Conduct of the exercise

After the introduction session, the participants were divided into three groups of about 18 people each, covering three different focus areas:

- surveillance and information sharing
- disease prevention and control
- communications.

The comprehensive and diverse composition of the country delegations presented challenges to facilitation of meaningful interactions among the various sectors.

Each group had representatives from six member countries, and English was used as a common language.

Four sequential steps followed (Figure 9), with the first three steps focusing on responses to a scenario of unfolding events set in the future and the last step returning to the present to plan for potential needs. The scenario started with human-to-human infection with H5N1 avian influenza outside MBDS countries, and evolved into a situation where one MBDS country identified an outbreak and then all countries faced outbreaks. The scenario stopped just before a full-blown pandemic developed.

Examples of questions given to each group include:

- Surveillance and information sharing:
  - What surveillance information do you need to collect and share with others? How will you get it?
  - What is the role of MBDS joint investigation?
  - What laboratory support may be needed from other MBDS countries or other partners?

- Disease prevention and control:
  - What population-based disease prevention/control actions are warranted at this time in the affected MBDS country? In unaffected MBDS countries?
  - What actions should you take to protect your health-care workers and other critical personnel?

- Communications:
  - How will you coordinate your risk communications across MBDS countries?

After going through each step, a plenary session was convened where each group presented their actions and key findings. After going through all four steps, a final plenary session was convened to review and agree on their key findings.

7. Evaluation

All participants and observers were asked to complete a pre-exercise evaluation on the first morning and a post-exercise evaluation at the end of the second day to enable comparison of the impact of the exercise. A follow-up meeting was convened on the following day among MBDS country team leaders and partner organization representatives to reflect on the exercise. An After Action Review capturing these reflections has been published.28

8. Lessons learnt

8.1 Preparation for and conduct of the exercise

**Participant engagement, concrete outputs:** The scenario led to meaningful small group discussions. These deliberations yielded concrete proposed actions and associated challenges, which were subsequently shared with the larger group and then fed into initial action planning at the end of the exercise.

**Stakeholder diversity and commitment:** The exercise involved a remarkable number of participants across countries, sectors and organizations, demonstrating the firm commitment of MBDS countries and partner organizations to the regional approach to pandemic influenza preparedness.

**Valuable observer input:** Technical resource personnel from the United Nations and the United States Centers for Disease Control provided rich input to the exercise at every step, from review and comment on early drafts of the exercise to helpful comments at the pre-exercise orientation, exercise deliberations and post-exercise review meeting. They are stakeholders in the larger global community and thus both shared valuable insights and, hopefully, drew some of their own from the MBDS exercise.

**Language barriers:** Not all exercise participants had an English language proficiency that allowed them to engage fully in the exercise.

**Size of small groups:** Given the language constraints and other factors, in retrospect smaller groups may have resulted in more dynamic discussions. However, this would have required fewer participants, or more facilitators and more plenary presentations.

**Multisectoral engagement:** The comprehensive and diverse composition of the country delegations presented challenges to facilitation of meaningful among

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the various sectors. Facilitators faced potential tradeoffs between useful health-oriented focus and multisectoral dialogue. Given the complexity of pandemic influenza and its potential impacts, the multisectoral approach was probably the right choice, but there remain opportunities for improvement.

**Final planning step:** Concrete planning for future activities was clearly an important area to address. However, the final plenary session did not provide the time or a comfortable environment for careful deliberation and full participation. In particular, participants found it difficult to follow the planning for activities that they had not discussed in their own small group. Therefore, the outputs from this step should be viewed as illustrative of the planning process rather than definitive planning of next steps.

### 8.2 Pandemic preparedness

**Commitment to regional cooperation:** Discussions during the exercise reflected a shared view among participants of the importance of MBDS regional collaboration in advance of a pandemic influenza emergency and, by extension, the importance of convening a regional group of stakeholders to discuss pandemic influenza issues and challenges. Joint activities require a framework for cooperation and operational guidelines, and thus time, trust among partners and formal actions by each country’s central government.

**Springboard to further planning:** Outcomes from the exercise are useful for revising certain elements of national plans, drafting a regional preparedness plan that is in line with WHO guidelines and potentially guiding future MBDS programming.

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**Figure 9 Conduct of the Regional Pandemic Influenza Table-top Exercise**

<table>
<thead>
<tr>
<th>Present</th>
<th>Future</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step Four:</strong> 'Back to the present': Group review &amp; analysis</td>
<td><strong>Start</strong></td>
</tr>
<tr>
<td><strong>Action planning</strong></td>
<td><strong>Phase 3 ➔ 4</strong> No MBDS</td>
</tr>
<tr>
<td>Determine priority actions, parties responsible &amp; time-lines for cross-border cooperation on:</td>
<td>- Surveillance &amp; info sharing</td>
</tr>
<tr>
<td>- Surveillance &amp; info sharing</td>
<td>- Disease prevention &amp; control</td>
</tr>
<tr>
<td>- Disease prevention &amp; control</td>
<td>- Communications</td>
</tr>
<tr>
<td>- Communications</td>
<td></td>
</tr>
</tbody>
</table>

| | **Phase 5 One MBDS** |
| | - Surveillance & info sharing |
| | - Disease prevention & control |
| | - Communications |

| | **Phase 6 (no-peak) All MBDS** |
| | - Surveillance & info sharing |
| | - Disease prevention & control |
| | - Communications |

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**Implications**
Multinational Planning Augmentation Team (MPAT) programme

Tempest Express 15

1. Background

The Multinational Planning Augmentation Team (MPAT) programme is a multinational programme with its Secretariat hosted by United States Pacific Command (USPACOM) in Honolulu, Hawaii. The programme is designed to develop a multinational cadre of military planners capable of augmenting a multinational force headquarters to plan and execute operations in response to a regional crisis. The Tempest Express (TE) staff planning workshops are essentially TTXs with participation from civil and defense sectors of government and representatives from the humanitarian community to improve the ability of nations and others to respond more rapidly to a sudden-onset crisis. The focus of the workshops is on practising crisis action planning and civil–military coordination. Recent TEs have focused on humanitarian assistance and disaster response (HA/DR) scenarios as the most likely type of contingency in the Asia-Pacific region requiring military assistance. Consequently, the participation base of the TEs has broadened beyond military officers, United Nations agencies and nongovernmental organizations, to include representatives from civil government agencies and donor organizations directly involved in HA/DR. TE events emphasizing HA/DR now encompass an approach that involves all sectors of government, with a focus on making the multinational military role more supportive to the affected state and humanitarian community.

Tempest Express 15 (TE-15) was conducted from 28 July to 1 August 2008 in Bali, Indonesia. It examined non-health sector issues generated during WHO Pandemic Alert Phase 5 and 6, and their national, regional and international impacts. The desired outcome for TE-15 was enhanced understanding of region-wide pandemic influenza issues and possible solutions and planning factors for national military and civil authorities and regional, international and United Nations responders.

2. Objectives

There were seven objectives for TE-15:

1. examine non-health sector issues associated with imminent uncontained outbreaks of human infection with avian influenza;
2. develop planning factors and possible solutions from a whole-of-government perspective with emphasis on the roles of defence establishments;
3. examine regional (ASEAN) disaster management and emergency response mechanisms during WHO Pandemic Alert Phase 5 and 6;
4. examine international disaster management and emergency response mechanisms;
5. determine issues that may require further examination in follow-on exercises or similar events;
6. support widest possible use of International Federation of Red Cross and Red Crescent Societies (IFRC) International Disaster Response Laws, Rules, and Principles definitions and guidelines;
7. support and complement existing regional disaster management and emergency response mechanisms (ASEAN Coordinating Centre for Humanitarian Assistance (AHA Centre) and Standby Arrangements and Standard Operating Procedures (SASOP)).
3. Participating agencies and organizations

<table>
<thead>
<tr>
<th>Nation/sector</th>
<th>Organization</th>
</tr>
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<tbody>
<tr>
<td>Australia</td>
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<td>Military</td>
</tr>
<tr>
<td>Philippines</td>
<td>Military, Civil Defence, National Disaster Coordinating Council, National Red Cross</td>
</tr>
<tr>
<td>Singapore</td>
<td>Military</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>Military</td>
</tr>
<tr>
<td>Thailand</td>
<td>Military, Department of Disaster Prevention and Mitigation</td>
</tr>
<tr>
<td>Timor-Leste</td>
<td>Military</td>
</tr>
<tr>
<td>Tuvalu</td>
<td>Department of Foreign Affairs</td>
</tr>
<tr>
<td>USA</td>
<td>Military, USPACOM, Department of State, Center for Excellence in Disaster Management and Humanitarian Assistance, Pacific Disaster Center, Asia-Pacific Center for Security Studies</td>
</tr>
<tr>
<td>Vanuatu</td>
<td>Police</td>
</tr>
<tr>
<td>United Nations</td>
<td>United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA), World Food Programme (WFP)</td>
</tr>
<tr>
<td>Nongovernmental organizations</td>
<td>International Medical Corps (IMC), Mercy Malaysia</td>
</tr>
</tbody>
</table>

4. Type of exercise

TE-15 was structured as a combination of a complex scenario-driven TTX and a functional exercise.

5. Preparation for the exercise

An initial meeting with the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) Regional Office for Asia-Pacific in January 2008 included the discussion of a regional pandemic influenza exercise involving military, civil and humanitarian community participants from the Asia-Pacific region. As a result of this initial discussion the USPACOM MPAT Secretariat developed objectives, a scenario and an exercise framework utilizing information from previous WHO workshops and exercises, USPACOM pandemic influenza exercises and WHO resources. This activity took place between April and July 2008. Periodically, meetings and collaborative activities were conducted with the Center of Excellence in Disaster Management and Humanitarian Affairs, which refined the proposed exercise and provided additional materials for the event.

MPAT TEs are conducted twice annually. USPACOM issues invitations to 30 nations with interests in the Asia-Pacific region as part of its regular theatre engagement and exercise programmes. In addition, invitations are issued to United Nations agencies, nongovernmental organizations and other civil government agencies that would benefit from this event.

As the USPACOM MPAT Secretariat is engaged with most of the potential participants in other activities, this event was informally discussed with other military, United Nations and nongovernmental organization representatives.

6. Conduct of the exercise

- Military and government participants were divided into five groups, or syndicates, each representing a fictitious country. Participants took the role of senior civil and military planners who must prepare for an imminent WHO Pandemic Alert Phase 6 outbreak.
- Each syndicate had to identify critical issues and develop possible solutions or planning factors to mitigate the effects of a Phase 6 pandemic influenza outbreak, based on the particular characteristics of their country.
- United Nations relief agency and nongovernmental organization participants formed a sixth syndicate, which supported the other syndicates and considered issues germane to their organizations.
- Information sharing among the syndicates was a key underlying theme of this event. Based on the evolving scenario and their country’s particular situation, each syndicate had to decide what information they must share with (or withhold from) other syndicates.
After the first day of briefings and individual syndicate organization, the syndicates began their tasks using the following scenario.

The scenario was based on the fictitious subcontinent of Pacifica, which consists of six countries, five of which are used for this event (the Pacifica countries are used in other United States and multinational exercises).

- Arcadia: a well-developed democracy with a vibrant economy.
- Tierra del Oro: a democracy with a diverse economy.
- Sonora: nominally a democracy, but a de facto military dictatorship with the largest military force in Pacifica.
- Mojave: newly created from Sonora and Tierra del Oro territories after a bitter conflict. Nominally a democracy, but local militias hold the real power. A United Nations mandate and peacekeeping force are assisting the new government.
- Isla del Sol: a desperately poor island nation, with an ineffectual government.

Human cases of avian influenza break out in Isla del Sol, and spread to Tierra del Oro via migrants seeking work in the agricultural industry. Containment efforts in Isla del Sol are ineffectual. Efforts in Tierra del Oro are more successful, but human infection with avian influenza spreads to Sonora, then to Mojave. Arcadia remains unaffected, so far. WHO declares a Pandemic Alert Phase 5. While the continent is not yet at Pandemic Alert Phase 6, WHO experts (who have been working closely with all of the countries) feel Phase 6 is imminent.

National leaders of the five countries are deeply concerned that the non-health issues resulting from a regional pandemic could cripple their economies and the social fabric of their nations. Pacifica nation leaders therefore agree to a Pacifica Summit to discuss pandemic influenza issues of mutual concern and explore where they might find common ground for a regional plan to combat the further spread of avian influenza. UNSIC, WHO and major nongovernmental and regional organizations are also invited.

In preparation for the summit, the Pacifica countries national leaderships have directed their respective military and civil agencies to develop specific tentative solutions and planning factors to address the non-health sector issues resulting from a spread of the pandemic.

- For Days 2–4 of TE-15, each syndicate was given specific tasks, completion of which would help them achieve their objectives. One of the tasks was to develop a framework for military support of basic infrastructure (power generation, for example).
- The scenario progressed from Day 2 through Day 4 with additional information provided to the countries as required.
- Each syndicate had a controller or facilitator to guide the syndicate and ensure that it met its objectives.
- TE-15 concluded with each syndicate developing recommendations for their country. Tasks for each syndicate were sufficiently varied that each syndicate would have several unique recommendations.

### 7. Evaluation

The MPAT Secretariat formed an After Action Review Team to gather input from the syndicate controllers and other participants. A formal report is due to be published later in 2008.
Part III

Other regional initiatives
1. Introduction
Severe acute respiratory syndrome (SARS) and avian influenza outbreaks have highlighted the need for a more effective and coordinated response to outbreaks of emerging and re-emerging infectious diseases. Against this background, ASEAN+3 (the Association of Southeast Asian Nations plus China, Japan and the Republic of Korea) initiated the ASEAN Plus Three Emerging Infectious Diseases Programme (ASEAN+3 EID) in 2004. Building on the gains of the first phase of the programme (2004–2005), the 8th ASEAN Health Ministers Meeting in Yangon, Myanmar, in June 2006 endorsed the ASEAN+3 EID Programme Phase II, a three-year programme (January 2007 to December 2009) managed by the ASEAN Secretariat and funded by the Australian Agency for International Development (AusAID). The programme supports various activities proposed and endorsed by ASEAN+3 that contribute to enhancing regional preparedness and capacity through integrated approaches to prevention, surveillance and timely response to emerging infectious diseases.29

As one of the main activities of the ASEAN+3 EID Programme, the Government of Thailand has been leading a project to build the capacity of the people responsible for exercise management for preparedness, prevention and control of emerging infectious diseases in ASEAN+3 countries. This has been conducted through the development of a training package for use in subregional training courses on exercise management, and organizing regional or subregional exercise management training workshops in several countries in collaboration with the Asian Disaster Preparedness Center (ADPC).

2. Objectives and expected outcome of the project
The primary objective of the Thailand-led project is to enhance the knowledge and skills of the people responsible for exercise management for preparedness, prevention and control of emerging infectious diseases in ASEAN+3 countries. This project builds on the conduct of a regional experience-sharing workshop and refinement of an exercise management training package supported by Kenan Institute Asia.

3. Design of the workshop
A five-day pilot training course has been designed and tested. It focuses on designing, developing, conducting and evaluating exercises to train national personnel who have responsibility for managing exercises in their respective countries or may have a role in training personnel in exercise management. After taking the course, the trainees are expected to contribute as facilitators for subsequent subnational or national exercise management training courses.

4. Workshop objectives
The objectives of the workshop are to provide participants with the necessary knowledge and skills:
• to build expertise in the management and conduct of communicable disease exercises;
• to provide participants with the skills and knowledge to conduct effective exercises;

29 For more details about the programme, please visit the ASEAN+3 EID web site (www.aseanplus3-eid.info, accessed 25 August 2008).
• to practise these skills and knowledge in the preparation and conduct of an exercise in the workshop.

5. Workshop sessions
The workshop is composed of 10 units conducted over a period of five days. The different sessions are based on the exercise management model cycle guiding the participants through the different steps, approaches, techniques and issues in managing an exercise. Each unit is designed in such a way that participants build their respective exercises thus: identify the need, analyse the need of the exercise they agreed to develop, design the exercise, conduct the exercise and plan how to evaluate the exercise. The exercise plans developed by the small groups are presented in plenary and the facilitators provide feedback for improvement. The model workshop agenda is shown in Table 19.

6. Future of the project
After several subregional training workshops with subsequent national and local exercises have been conducted, a regional workshop will be convened to integrate lessons learnt and feedback into the refinement of the training package.

<table>
<thead>
<tr>
<th>Table 19 Model workshop agenda</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>30 March Sunday</strong></td>
</tr>
<tr>
<td>08:30</td>
</tr>
<tr>
<td>09:00</td>
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<tr>
<td>10:00</td>
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<tr>
<td>12:00</td>
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<tr>
<td>15:00</td>
</tr>
<tr>
<td>17:00</td>
</tr>
</tbody>
</table>
1. Introduction

In order for the United Nations system to be better prepared for an influenza pandemic, the United Nations Secretary-General requested all United Nations duty stations to develop pandemic contingency plans in March 2006. To date, around 140 United Nations country teams (UNCTs) have developed plans and many of them have tested their plans through simulation exercises.

In order to assist UNCTs to run simulation exercises, the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA)/Pandemic Influenza Contingency (PIC) in collaboration with colleagues from partner agencies including United Nations System Influenza Coordination (UNSIC) and the United Nations Children’s Fund (UNICEF) developed two pandemic simulation packages:
- TTX pandemic simulation
- Functional pandemic simulation.

2. Types of simulation exercises

2.1 TTX pandemic simulation
The UNCT TTX pandemic simulation package has been developed by UNOCHA/PIC through a consolidation process using simulation materials developed by various organizations including UNICEF and UNSIC. The TTX pandemic simulation is primarily used as a tool to assist UNCTs, governments and agencies that may not yet have preparedness plans in place, or that may have a plan that is still in the process of being developed.

The main objectives of the TTX pandemic simulation are to:
- raise the level of awareness of pandemic influenza and the impact that it could have on staff health and safety and operational continuity;
- understand through the use of scenarios the key requirements for preparedness measures to ensure the health and safety of staff and continuity of essential services during a pandemic;
- identify and plan for additional requirements to support national pandemic preparedness and to assist governments during a pandemic.

A facilitator leads the exercise, trying to involve as many agencies and participants in the discussions as possible, providing some additional inputs to stimulate the discussions and ensuring that the discussion does not move on to other issues or go into too much specific detail, which should be taken up in the debriefing instead.

The scenarios and injects that follow are delivered via audiovisual presentations with participants being given a series of three increasingly serious scenarios. The exercise starts with rumours about certain events that might indicate an outbreak of a respiratory disease (possibly influenza related) in a neighbouring country and then, in the second part of this scenario, within the country. The next scenario confirms an outbreak of H5N1 avian influenza with human cases in the country, leading to a situation were larger clusters appear and a mutation of a novel virus is confirmed by WHO. Finally, the scenario describes a full-blown pandemic that affects not only people’s health but also the delivery and availability of essential services and critical infrastructure.

The scenarios are designed in such a way that WHO Pandemic Alert Phase 3 develops directly into Phase 5. The exercise in its current form does not involve recovery or additional waves of infection beyond the first wave.

After each scenario is introduced the facilitator raises a series of leading questions covering topics that are relevant to pandemic planning, including: communication with staff, governments and headquarters; command and control structures; triggers for decision-making; logistic back-up systems; and a number of likely ethical dilemmas.
The TTX is designed to be run based on a maximum ratio of 20 participants per facilitator. Participants are ideally at the level of head of agency or deputy or senior programme or operation manager, and will include some key staff dealing with security and medical services.

During the exercise, the participants discuss the actions that should or should not be taken in the face of the given situation and its development. Ideally the discussion is based on the provisions made in the UNCT contingency plan, but often involves ad hoc opinions and decisions of the participants. Contrary to functional exercises, no role play takes place.

The package has changed after each exercise carried out and is specifically designed to minimize the amount of preparation time required.

The TTX simulation takes up to four hours to run through the scenarios. A further three hours is required for debriefing (ideally the same afternoon), which is aimed at producing a table of identified weaknesses and action points, with responsibilities to work on the identified issues within a specific time-line.

Once the simulation has been completed, the participants should be able to use the information gained during the discussion session and subsequent debriefing by the facilitator as a basis for writing or updating their plan, including an agreement on it with the commitment of the present heads of agencies and the Resident Coordinator.

**UNCT TTXs conducted in the Asia-Pacific region to date**

<table>
<thead>
<tr>
<th>Country</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timor-Leste</td>
<td>11 September 2007</td>
</tr>
<tr>
<td>Lao People’s Democratic Republic</td>
<td>2 October 2007</td>
</tr>
<tr>
<td>Fiji</td>
<td>15 November 2007</td>
</tr>
<tr>
<td>Philippines</td>
<td>21 November 2007</td>
</tr>
<tr>
<td>China</td>
<td>25 January 2008</td>
</tr>
<tr>
<td>Indonesia</td>
<td>5 March 2008</td>
</tr>
<tr>
<td>India</td>
<td>25 April 2008</td>
</tr>
<tr>
<td>Mongolia</td>
<td>14 May 2008</td>
</tr>
<tr>
<td>Malaysia</td>
<td>21 May 2008</td>
</tr>
<tr>
<td>Nepal</td>
<td>11 June 2008</td>
</tr>
</tbody>
</table>

The total number of participants, ranging from 25 to 60, depends on the number of agencies in each country. Each agency sent 2–4 participants, one of which was in most cases the head or deputy head of agency or another senior member of staff.

Some country teams invited in-country partners and observers from other country teams to participate in the exercises. In China, the UNCT in Mongolia took part in the activity as observers. The Ministry of Health, Ministry of Agriculture and Beijing Health Bureau also sent observers to the exercise. In India, there was one observer from the UNCT in Sri Lanka.

### 2.2 Functional pandemic simulation

The functional simulation package was developed in November 2007 based on a UNICEF country office package. Since 2007, the package has been modified by UNOCHA/PIC based on pilot simulations conducted in Thailand and Cambodia. The functional simulation is a more structured package than the TTX and is essentially a tool for testing pandemic contingency plans that are already in place. The group size can be larger than the TTX, with participants divided into groups (Senior Management Team, Operations, Programming and Communications, or as decided by the Resident Coordinator). The scenarios against which the simulation is run are essentially the same as for the TTX.

The objectives of the functional simulation are to:

- test the pandemic preparedness of the UNCTs and individual United Nations agencies (or other organizations) to:
  - ensure health and safety of staff;
  - ensure continuity of operations, including delivery of humanitarian aid to the most vulnerable groups;
  - support the government for pandemic response.
- assess response gaps and identify key measures to enhance pandemic preparedness;
- test the decision-making and coordination mechanisms within the UNCTs and with national authorities and non-United Nations partners;
- assess the capacity of each United Nations agency to support the government;
- strengthen team building among UNCT members.

The simulation is normally run over the course of two days, 4–5 hours for the simulation followed the next day...
by a four-hour debriefing session. The package is best delivered electronically, with participants receiving the scenarios, injects and action requests by e-mail.

As a result of the simulation and debriefing activities, UNCT members should:
- be better prepared to act and respond appropriately according to their roles;
- assess gaps in pandemic preparedness and identify lessons learnt (potentially applicable to other disaster planning scenarios);
- be familiar with the current plans, information, guidelines, documentation and tools available to manage a pandemic influenza;
- gain a better sense of the respective role of each United Nations agency in supporting the national authorities in responding to a pandemic;
- assess the actual capacity of the country team to continue current programmes and undertake new activities to support the government pandemic response;
- be familiar with United Nations administrative rules for pandemic situations;
- strengthen team building for managing pandemic response and other emergencies among country team members.

Adaptability

It should be noted that while the simulation packages described above were created with the specific purpose of pandemic planning, both can be easily adapted for use in other forms of emergency or multi-hazard planning.

Functional simulation exercises conducted in the Asia-Pacific region

<table>
<thead>
<tr>
<th>Country</th>
<th>Date</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bhutan</td>
<td>1–2 March 2007</td>
<td>Led by UNICEF</td>
</tr>
<tr>
<td>Maldives</td>
<td>1 May 2007</td>
<td>E-mail-based</td>
</tr>
<tr>
<td>Thailand</td>
<td>3–4 December 2007</td>
<td></td>
</tr>
<tr>
<td>Cambodia</td>
<td>29–30 January 2008</td>
<td></td>
</tr>
</tbody>
</table>

3. Evaluation

Evaluation sheets were distributed to all participants and observers at the start of the exercise and collected at the end of the exercise. The evaluation covers aspects of feedback on (a) simulation objectives (review the pandemic preparedness of UNCTs and individual United Nations agencies, assess gaps and weaknesses and identify measures to enhance pandemic preparedness of country teams, review coordination mechanisms within the country teams and with national authorities and non-United Nations partners, renew or create commitment to the contingency planning process, decide on a ‘road map’ for future action); (b) self-preparedness; and (c) facilitation. Some country teams developed reports annexed with outcome evaluations.

4. Lessons learnt

Although simulation exercises usually take place at a later stage of the planning cycle, in order to identify gaps and strengths of the plan, one common experience was that in many cases the exercise made the possible impact of a pandemic clear to the participants for the very first time. In addition to testing the plan, it therefore helped to renew the interest and the commitment of the UNCT to the process of developing appropriate pandemic preparedness and contingency plans.

As a result, the exercises usually succeeded in producing a road map on the next steps to be undertaken by the country team with the agreement and the renewed commitment of the different agencies and the Resident Coordinator.

The exercises usually succeeded in producing a road map on the next steps to be undertaken by the country team.

The main issues that were usually identified as weak or in need of revision were:

I. Clear definition of responsibilities for:
- monitoring of events in or outside the country that might require a discussion among senior country team members;
- decision-making structures (organigram);
- a comprehensive system to assure effective communication between the country team and all agencies, at all levels and in all locations;
- communication with external actors (government, media, other organizations, etc.);
- trigger mechanisms that would lead to the country team and the individual agencies taking specific (new) actions;
- sets of actions to be taken if the situation develops to a new level.

II. Detailed preparation of specific issues:
- human resources issues (definition of essential staff and their alternates, leave entitlements, inclusion of consultants and short-term staff, etc.);
- medical issues (entitlement to receive oseltamivir, legal issues related to dissemination of oseltamivir...
and instructing staff on how to use it, issues of disposing of expired oseltamivir and procurement of replacement stocks, knowledge of contracted external ‘United Nations physicians’ about United Nations procedures and expectations, etc.);
• communication measures that can be prepared and be readily available at different stages of the developments towards a full-blown pandemic;
• clear definitions within the different United Nations agencies about their projects and programmes with regards to their eventual continuation or discontinuation (business continuity planning).

III. Other issues:
• provision of assistance to the government during a pandemic;
• linkages between the different WHO phases and the United Nations security levels;
• linking United Nations agency contingency plans with the UNCT contingency plan;
• questions related to the cluster approach and the work of interagency standing committees (IASC) in relation to the country team contingency plan;
• need for sharing of information between country teams, interagency standing committees and government with regards to the different preparedness or contingency plans.

At the end of the simulation exercises, the UNCTs usually committed themselves to further revising or developing their contingency plans (UNCTs and United Nations agencies) and assigning responsibilities for this process to certain staff members and agencies or working groups. External follow-up and support might be helpful or even necessary in order to make the best out of such renewed commitment and to eventually transfer lessons learnt from the avian influenza contingency planning process to other contingency planning activities (UNCTs, interagency standing committees, United Nations agencies) and towards an integrated all hazards planning and preparedness approach.
Annex

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Note: All details were correct at the time of drafting this publication.
The presence of the highly pathogenic avian influenza H5N1 virus has been confirmed in more than 60 countries around the globe over the past three years. The virus continues to spread among birds in many parts of the world, causing sporadic cases of human infection, and posing the threat of a global influenza pandemic. The Asia-Pacific region, where the virus first emerged, faces the highest risk of becoming an epicentre for the emergence of a pandemic strain.

Here, national governments have developed pandemic preparedness and response plans, and many have tested their plans through simulation exercises. Simulation exercises are a crucial component of the pandemic response planning process. Many different types of simulation exercise have taken place across the region, with various objectives and stakeholders.

This publication is a compendium of the simulation exercises that have been used to test pandemic preparedness and response plans in different countries and by various organizations in the Asia-Pacific region. Whether you are working in central or local government, international or regional organizations, the nongovernmental or private sector, the experiences gathered here will no doubt help you prepare for the next pandemic.