

Part I

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,¹ 112 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.² 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.

¹ *Responses to avian influenza and state of pandemic readiness, third global progress report.* UNSIC, World Bank, December 2007 (<http://un-influenza.org/files/12-18-07UN-WBAHIPProgressReportfinal.pdf>, accessed 21 May 2008).

² *Exercise development guide for validating influenza pandemic preparedness plans.* WHO Regional Office for the Western Pacific, February 2006 (<http://www.wpro.who.int/NR/rdonlyres/DA340E3E-D27E-47A6-9833-452E7AAC9ED5/0/EDTedDRAFT1ExerciseDevelopmentGuide.pdf>, accessed 21 May 2008).

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:^{2,3}

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

3 *A guide for conducting table-top exercises for national influenza pandemic preparedness*, New Delhi, WHO Regional Office for South-East Asia, December 2006 (http://www.searo.who.int/LinkFiles/Publication_156_guide_conducting-TTX.pdf, accessed 21 May 2008).

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

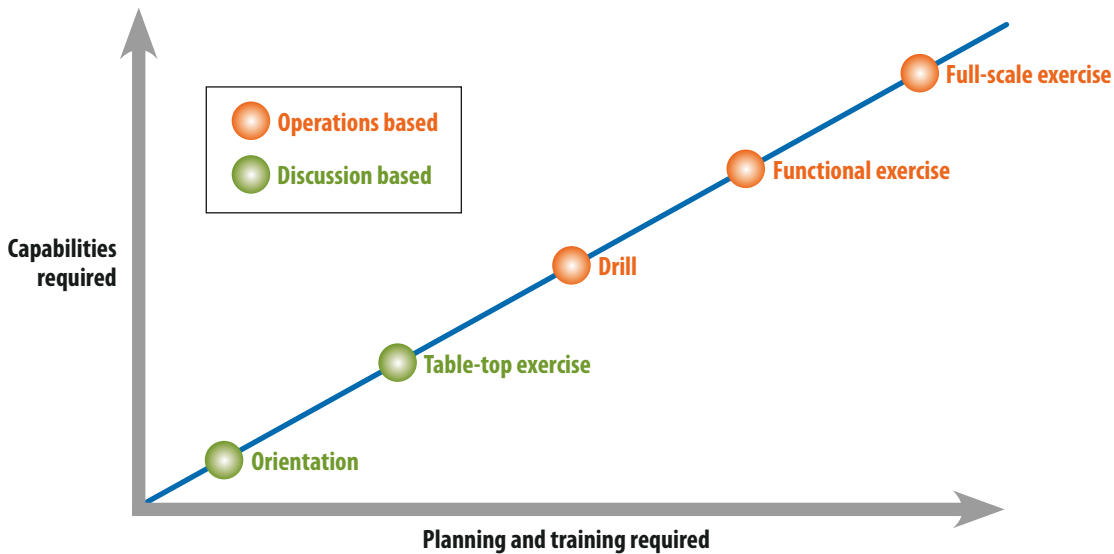
A functional exercise involves creating a situation and facilitating a 'real' response, and may include such activities as activating command centres, documenting actions and decisions, completing real forms, issuing real communications and responding to simulated media or other questions. It is different 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.

Figure 1 Requirements for conducting different types of simulation exercises



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

What is the basis for selecting exercise types?

Each of the exercises listed above has strengths and weakness 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 weakness 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 weakness. 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

⁴ The Homeland Security Exercise and Evaluation Program (HSEEP), Volume 1: HSEEP overview and exercise program management, United States Department of Homeland Security, February 2007 (<https://hseep.dhs.gov/support/Volumel.pdf>, accessed 21 May 2008).

exercises, various WHO guides are available.^{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 1 Utility, cost and planning time for different types of simulation exercises

Exercise type	Cost	Planning time	Policy	Plan	Procedure	Tactic	Skill
Orientation	\$	2 weeks to 2 months	Low	Low	Low	Low	Low
Drill	\$\$	1 to 3 months	N/A	Low	Medium	High	High
Table-top exercise	\$	2 to 6 months	High	High	Medium	N/A	N/A
Functional exercise	\$\$\$ to \$\$\$\$	2 to 12 months	Medium	Medium	Medium	High	High
Full-scale exercise	\$\$\$\$\$+	3 to 12 months	High	High	High	High	High

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.⁵

⁵ Report of the "APEC Health Task Force Seminar on Assessing Pandemic Preparedness", APEC, 2006 (http://aimp.apec.org/Documents/2006/HTF/HTF2/06_hft2_020.doc, accessed 25 August 2008).

