TECHNICAL REPORT

Bioterrorism Preparedness Training and Assessment Exercises for Local Public Health Agencies

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Preface

One of the challenges of public health since 9/11 and the subsequent anthrax attacks has been to improve bioterrorism preparedness in state and local public health agencies. In order to accomplish this task however, we must first develop tools and indicators to reliably measure bioterrorism preparedness so that gaps in bioterrorism preparedness can be identified and improvements can be measured over time.

This operations manual presents a series of tabletop exercises that focus on bioterrorism preparedness to be used as a tool by local public health agencies to measure and assess their level of bioterrorism preparedness. The exercises focus on the public health response to a bioterrorism emergency in the first few hours to days of an emergency when local public health agencies are the primary actors involved in detecting and initially responding to the emergency. We refined these exercises by beta testing them at 13 metropolitan area local public health agencies over the course of 10 months.

The contents of this manual will be of interest to public health professionals at the state and local level who are involved in bioterrorism response in their agencies.

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Developing this operations manual involved the participation of dozens of public health professionals from 13 metropolitan area local public health agencies across the country. We are deeply grateful for their willingness to participate in the exercises and to provide us with constructive feedback while we beta-tested the manual. We would like especially to thank Dr. Susan Lance, State Epidemiologist at the Georgia Division of Public Health and Dr. David Mosher at the RAND Corporation for their in-depth review.

We would also like to acknowledge the assistance and guidance of Dr. William Raub, Principal Deputy Assistant Secretary for Public Health Emergency Preparedness, and Ms. Lara Lamprecht, Program Analyst, of the Office of the Assistant Secretary for Public Health Emergency Preparedness at the U.S. Department of Health and Human Services. Their commitment to developing tools and resources to help public health agencies improve the country's public health preparedness was the driving force behind this work.

Chapter 1.
Introduction

This manual contains templates for 10 tabletop exercises designed to assess the ability of local health departments[1] to successfully detect and respond to a bioterrorism (BT) attack, from the first hours through the first few days following a disease outbreak. Although these exercises specifically address BT preparedness, the basic public health challenges posed by naturally occurring and BT outbreaks are very much the same and thus bioterrorism preparedness has "collateral benefits" for preparedness dealing with any disease outbreak—natural or intentional (Danzing, 2003). Therefore, these exercises should be helpful to health departments preparing for all types of disease outbreaks.

The ten exercises in this manual:

- Provide a wide choice in time commitment (ranging from 2 to 6 hours for individual exercises)
- Can be readily tailored to meet specific objectives
- May include participants from the health department only – or (in the case of some of the exercises) from the wider community (such as police, firefighters and hospital personnel)
- Exercise a broad spectrum of preparedness issues and proficiencies
- Are adaptable to a wide range of health departments – including large and small, urban and rural
- Encourage customization

OBJECTIVES AND STRUCTURE OF MANUAL

The manual's four primary objectives are to:

- Serve as a "guidebook" for planning individual tabletop exercises and developing a regular system for training and assessment of the public health department's preparedness
- Serve as a training and reference manual for individuals conducting an exercise
- Provide tools and templates necessary to conduct an exercise
- Provide a strategy and format for evaluating the exercise at least twice:
    - Participants will evaluate the exercise immediately after completion (referred to as a hot wash)
    - The facilitator and note taker will prepare a written report (referred to as an after-action report)

The two "guidebook" portions of this manual serve as bookends. The first (Chapter 2) explains how to plan and develop an exercise from one of the exercise templates provided in this manual. The second (Chapter 6) describes how to set up a regular program of exercise-based testing. The portion of the manual between these

[1] The term "local health department" is used in this manual to signify all health departments below the state and regional level (e.g., district, county, municipal, etc.).

bookends contains instructions on training and preparing to facilitate the exercise (Chapter 3), conducting the exercise (Chapter 4), and setting up a regular training and assessment framework (Chapter 5). The remainder of this chapter provides a broad overview of the exercises contained in this manual.

GENERAL EXERCISE FORMAT

The tabletop exercises in this manual present simulated public health emergencies and require participants to work together as a group to describe how they would respond if the situations were real. This manual contains nine exercise templates and one "create-your-own" exercise template. These exercise templates share five common elements:

- *Initial situation reports*
- *Case reports*
- *Facilitated discussion*
- *Situation updates*
- *Hot wash*

Each element is briefly described here and discussed in greater detail in the chapter sections indicated below.

Initial situation reports put the exercise into a particular context. Each report supplies a backstory, providing a brief account of the key events leading up to an outbreak or the threat of an outbreak. Situation reports can be customized to be more relevant to the local environment.

Case reports build on the initial situation reports by presenting the group with a series of cases that may require a public health response. The case reports progress from cases of questionable importance to obviously serious cases. Each case report requires the group (and individual participants) to describe what they would do if presented with such a case in real life. Case reports are designed to be customized to be more relevant to the local environment. For example, the names of local health care facilities are inserted into the case reports.

Facilitated discussion occurs as new information (case reports and situation updates – see below) is presented to the group. The facilitator encourages participants to discuss (in as much detail as possible, given time constraints) how they would respond to the evolving scenario under consideration. The primary goal of facilitation is to be sure that participants address all key issues. See Chapter 3 for more detail.

Situation updates are used throughout the exercises to update the scenario presented in the initial situation report and case reports. Situation updates keep the discussion moving forward and encourage flexibility in responding to different stages of an emergency.

The *hot wash* is a stocktaking period after the exercise in which participants discuss their responses to individual exercise elements and the exercise as a whole and

identifies strengths and areas for improvement. The goal of this session is to give the participants an opportunity to reflect on the exercise and lessons learned.

Hot wash feedback also informs the *after-action report* and can be used as a starting point for a *continuous quality improvement* process. See Chapter 5 for more detail.

ISSUE AREAS COVERED

Public health preparedness covers a broad issue spectrum that cannot be assessed in any single tabletop exercise. The exercises in this manual cover the following six key issue areas:

- *Surveillance and Detection*
  - Use of existing surveillance systems to detect potential outbreaks
  - Initiation of active surveillance
- *Diagnosis and Investigation*
  - Establishing a case definition
  - Clinical and laboratory investigations
  - Epidemiologic investigation
- *System-Wide Coordination*
  - Handoffs with regional or state health department
  - Coordination of efforts with other local and state actors (e.g., elected officials, law enforcement, etc.)
  - Establishment of an Emergency Operations Center
- *Risk Communication*
  - Effectively communicating essential messages to the public
  - Initiation of a public information campaign
  - Coordination of information to media
- *Disease Control*
  - Prophylaxis and vaccination capabilities
  - Isolation and Quarantine
  - Closing of schools, workplaces, hospitals, etc.
- *Consequence Management*
  - Treatment of affected individuals
  - Assessing the provision of needed care
  - Surge capacity

These issues were chosen to highlight activities identified in the literature that should be considered or undertaken by local health departments in the first few hours to days of an outbreak (Gregg, 1996; Plant, 1998, Reingold, 1998, Tyler and Last 1998). The point at which regional or state health departments become involved in the response depends upon the structure of the local health department and its relationship to the state. Exercises in this manual may be adapted to incorporate these issues. Not all issues are covered in every exercise.

EXERCISE TYPES

The ten exercises in this manual include:

- *Four short exercises (up to 2 hours)*
- *Four medium-length exercises (half-day)*
- *One long exercise (full-day)*
- *One create-your-own exercise (can be short, medium or long)*

The short exercises take approximately two hours to complete, the medium exercises take approximately four hours, and the long exercise takes approximately six hours. Preparing an after-action report takes an additional 2-3 hours.

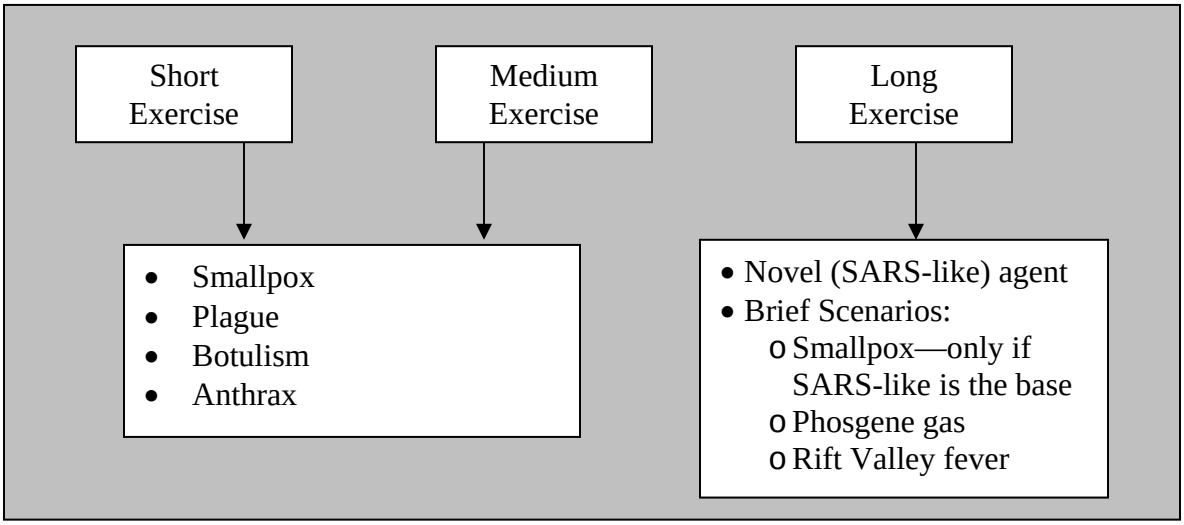
AGENTS USED IN EXERCISES

In order to fully exercise the broad range of issues outlined above, the exercises in this manual were developed around 5 potential bioterrorism agents[2]:

- Smallpox
- Plague
- Botulism
- Anthrax
- Novel (SARS-like) agent

These agents were chosen because they have been identified in the literature as agents that represent our most significant risks, illuminate how the public health system would be taxed in a variety of bioterrorism events, and stimulate a broad range of bioterrorism preparations (Danzing, 1998). The short and medium exercises focus on a single agent among the four listed above (see Figure 1.1). The long exercise contains four separate agents: Novel (SARS-like) agent, smallpox, phosgene gas, and Rift Valley fever. Exercise templates are flexible and may be modified to include different agents.

Figure 1.1 Agents Used in the Different Exercise Types



[2] Appendix E contains background information on each of these diseases.

Chapter 2.
Planning an Exercise

EXERCISE FREQUENCY

The CDC recommends that at least once per year, all health departments exercise and assess their ability to respond to bioterrorism outbreaks (CDC, 2005). This manual is designed to provide public health agencies with tools to conduct such exercises.

STAFFING AND MATERIALS

The staff needed to conduct an exercise includes an organizer, facilitator, and note taker. The facilitator and the organizer may be the same person. However, the note taker should be a separate person; the facilitator will be too busy during the session to take notes.

The exercise organizer is in charge of putting the entire exercise together. An organizer's duties fall into three broad categories:

- Planning and Logistics:
  - Identify an exercise facilitator and note taker
  - Identify and recruit participants
  - Schedule a date and time for the exercise
  - Identify and reserve a venue for the exercise
  - Arrange for beverages and food to be provided at the exercise
  - Obtain nametags for participants
  - Create folders for participants
  - Make copies of exercise materials
- Exercise Customization and Completion (explained in greater detail in Chapter 2 and in Appendices A-D); the organizer and the facilitator should coordinate closely on this task:
  - Choose an exercise from the appendices to conduct
  - Customize exercise discussion guide using exercise template
  - Create PowerPoint presentation based on discussion guide
  - Review exercise with facilitator and note taker
- Management:
  - Ensure participants have everything they need on the day of the exercise
  - Set up the exercise room prior to the exercise
  - Provide nametags to participants on exercise day
  - Ensure beverages and food arrive at the exercise on time

The exercise facilitator is the person in charge of leading the exercise discussion. Ideally, exercise facilitators should have experience with leading tabletop exercises. Chapter 3 discusses the role of the facilitator and identifies training and preparation strategies for new facilitators.

The note taker has the important role of recording what happens in the exercise and generating an after-action report. Chapter 5 discusses exercise assessment and how to prepare an after-action report.

Additional requirements to conduct an exercise include:

- Conference room able to seat 12-15 people
- Computer with MS PowerPoint and projector (optional)
- Marker board, flip board, or chalkboard
- Copies of exercise materials to give to participants

CHOOSING AND CUSTOMIZING AN EXERCISE

A customized exercise can be developed from one of the exercise templates in Appendices A-C. Figure 2.1 presents the different exercise templates available in this manual and the location of those templates in the Appendices. Appendix D is a "create-your-own" exercise template that lets users develop a customized short, medium, or long exercise.

Choosing an appropriate exercise template involves four primary considerations:

- Amount of staff time dedicated for the exercise
- Previous exercise experience
- The issue areas and capabilities the health department wishes to assess/enhance or train on
- Range of participants participating in the exercise

Figure 2.1 Choices of Exercise Templates

Type	Agent	Length	Template Exercises
Short	Anthrax	2-hours	Appendix A1
	Botulism		Appendix A2
	Plague		Appendix A3
	Smallpox		Appendix A4
Medium	Anthrax	4-hours	Appendix B1
	Botulism		Appendix B2
	Plague		Appendix B3
	Smallpox		Appendix B4
Long	Multiple	6-hours	Appendix C1-4

Short, medium, and long exercises obviously differ in the amount of time that will need to be dedicated to the exercise. The primary reason for choosing a medium or long exercise over a short exercise is that the medium and long exercises provide more time to discuss important topics as well as a wider range of important topics. Short exercises for example focus on topics of surveillance and detection and diagnosis and investigation

while Medium exercises go beyond these topics to discuss system-wide coordination, risk communication, and disease control. The Long exercise adds one final topic not covered in the short or medium exercises: consequence management. Therefore the choice of exercise length needs to be contrasted upon the amount of time a public health agency has to dedicate to conducting an exercise and the range of topics that agency wants to cover.

There are also 5 agents or diseases (outlined in Chapter 1) to choose from. Choosing an agent is important for a number of reasons. First, public health agencies may feel over exercised on certain diseases like smallpox. The choice of different diseases allows agencies to diversify their exercise experiences. The choice of disease also has real ramifications for the issues that are covered in that exercise. For example, smallpox is contagious whereas anthrax is not. Smallpox therefore involves many issues like quarantine and isolation that anthrax does not and therefore the discussion for these two exercises is usually very different.

Three components of the exercise can be customized to tailor exercises to a local environment and to the way in which local health departments relate to regional or state health departments:

- Initial situation report
- Case reports (e.g., names of local healthcare facilities, universities, etc.)
- Situation updates (e.g., names of local healthcare facilities, etc.)

The initial situation reports for the medium length exercises can be customized to one of three choices an outbreak that occurs first:

- Within the public health agencies local jurisdiction
- In the same region of the country as the public health agency
- In a distant region of the country far away from the public health agency

The choice between these three options is important. If health officials choose an to do an exercise where the outbreak first occurs in their local jurisdiction, they will be testing an instance in which their public health agency has no advanced warning of the outbreak. In the initial part of the exercise this will involve a very different response than if health officials choose instead to focus on an exercise in which an outbreak happens somewhere else first and they have a heads up to begin preparations for an outbreak in their jurisdiction.

In the end however, these choices of where the outbreak occurs first have an important influence over how a public health agency responds to an outbreak. For example, an agency that witnessed an outbreak of smallpox in a nearby state would have time to initiate active surveillance before they even responded to a single case whereas if that same agency had no advanced notification, they would have to initiate active surveillance after they jurisdiction already had cases.

Public health agencies in major metropolitan areas (like New York or Los Angeles, or Chicago) may choose to focus on an outbreak that happens in their jurisdiction first because in reality this may be what they are expecting. Other public health agencies in more rural settings may feel that it is more realistic to start out with an outbreak that occurs in some other part of the country first.

All sections of the exercise templates requiring customization are highlighted in bold with brackets: **[example]**. The exercise templates also contain periodic instructions highlighted in italics with brackets: *[example]*.

Each section of the exercise templates has text that is contained within a gray box. These sections of the exercise templates provide templates for PowerPoint slides that can be created to aid in the presentation of the exercise. For example, Figure 2.2 contains an example of highlighted text from the short anthrax exercise (Appendix A1). This type of information can be used to generate an appropriate PowerPoint slide for the initial situation report.

Figure 2.2 Sample Template to Create a PowerPoint Slide

July 15, **[year]**:

- **[Local area]** is locked in a continuing heat wave with daytime high temperatures expected to reach over **[number]** degrees Fahrenheit
- Summer vacation traffic is high and air quality is poor
- The health department has been receiving a steady stream of calls with reports of dehydration, especially among infants and elderly
- Some of the elderly patients have developed respiratory distress and two have died
- Senior centers have begun to distribute fans to elderly citizens without air conditioning

The exercise coordinator chooses an appropriate exercise template and customizes the parts of the exercise requiring customization. Chapter 4 outlines each of the exercise components requiring customization.

CHOOSING AND RECRUITING PARTICIPANTS

The individuals invited to attend an exercise will depend on the structure of the health department and its relationship with the state or regional health department. The medium and long exercises are designed to simulate a likely flow of events that would also involve stakeholders outside the health department and will be more effective if such stakeholders are included. Suggested participants for these exercises include:

- Local Health Department Staff

    - Health director
    - Communicable disease control director
    - Bioterrorism coordinator
    - Epidemiologist
    - Representative from a public health laboratory
    - Public health nurse
    - Public Information Officer
- Local Stakeholders
    - Law enforcement
    - EMS personnel
    - Hospital infection control staff
    - Local physicians
    - Minority community leadership
    - Elected officials
    - Emergency Management official

Depending on the local environment and the relationship between the state, the regional (if such exists), and the local health department, it may be useful to include regional or state health department staff in an exercise. (Actually recruiting participants is the responsibility of the exercise organizer.) Health department directors may decide to make the exercises required training experience for selected staff members.

CHOOSING A VENUE AND SETTING UP A ROOM FOR AN EXERCISE

Choosing an appropriate venue and properly preparing the meeting room are both important prerequisites for a successful exercise. Venues should be convenient for all participants. The room should be set up to facilitate casual group discussion, and all participants should be able to see one another. The ideal set-up is a semicircle seating arrangement with participants facing a PowerPoint-enabled projection screen.

Chapter 3.
Learning to Facilitate an Exercise

TRAINING AND PREPARATION TO FACILITATE AN EXERCISE

All the exercises outlined in this manual involve a facilitator whose job it is to:

- Set up the exercise discussion with the initial situation report
- Introduce the case reports
- Answer participant's questions
- Ensure that all participants actively take part in the exercise
- Provide participants with situation updates during the exercise
- If necessary, use "probes" to ensure that all key issues are discussed
- Keep the discussion moving at a reasonable pace within the various timeframes allotted for the individual steps in the exercise
- Help participants think through the final "hot wash" stocktaking session

The facilitator could be the director or bioterrorism coordinator for another local health department if the goal of the exercise is training. If the goal of the exercise is assessment, it is more useful if the leadership personnel participate in the exercises. This chapter outlines strategies for first-time or beginner facilitators to hone and develop the skills required to perform the tasks cited above.

Prior to an exercise, the facilitator will want to become familiar with the exercise and the disease or agent being discussed in the exercise. The facilitator does not need to be a clinician or physician just because the case reports are clinical in nature; a facilitator need only have enough knowledge about the disease or agent being used to answer questions from participants and facilitate the exercise.

USING CHECKLISTS AND PROBES

Checklists help ensure that all major issue areas relevant to the exercise objectives are covered. Each of the exercise templates in the appendices contains checklists for the major issue areas addressed in that exercise. The facilitator can use the checklists to make sure that the discussion is not getting too far off-track and to help decide whether to guide the discussion with "probes." Examples of probes can be found in the exercises in the appendices.

Probes should be used on a case-by-case basis, keeping in mind the objectives for the exercise. For instance, if one objective were to assess whether health department staff know how to respond to a disease outbreak, it would be inappropriate to provide too much guidance about how to respond. On the other hand, the facilitator should not miss the opportunity to discuss critical parts of the response just because the participants did not think of them.

One solution is timing: the facilitator could first ask the participants to prepare a checklist for a particular issue area, and then make sure that the subsequent discussion covers all relevant topics, even if the participants did not put them on the checklist.

Figure 3.1 contains a sample checklist. This checklist can be used as a reference for the major topics that would be covered in a typical discussion of diagnosis and investigation. The facilitator could refer to the checklist periodically during the discussion to ensure that all key points are covered. The checklist does not prescribe an order for discussion topics. In fact, discussion rarely follows the order of items in a checklist.

Participants should be given the opportunity to raise topics without being guided, and facilitators will need to use their own judgment to determine if participants skipped a topic they are unlikely to return to later in the discussion. In this case, the facilitator may decide to use a probe to guide discussion toward an important topic. Additionally, the note taker can use checklists to aid note taking and to help create the after-action report.

Figure 3.1 Sample Checklist

Checklist: Diagnosis and Investigation

- ☐ Establish case definitions; find existing definition
- ☐ Confirm that the cases are “real” and identify the agent
- ☐ Establish background rate; decide if there is an outbreak
- ☐ Identify new cases through active or enhanced surveillance
- ☐ Investigate suspected cases identified by surveillance
- ☐ Examine descriptive epidemiology; define the scope of the outbreak
- ☐ Generate hypotheses about source of exposure
- ☐ Collect and test samples

ACHIEVING A BALANCED FACILITATION STYLE

Too little -- or too much -- facilitation can result in an unsuccessful exercise. The facilitator should keep the discussion moving forward on track, without over-leading the participants. This balance is learned through experience and observation. Figure 3.2 compares balanced facilitation (center) to too little facilitation (left) or too much facilitation (right).

Figure 3.2 Balanced Exercise Facilitation

Too Little Facilitation	Just Enough Facilitation	Too Much Facilitation
• Long or awkward pauses in the discussion • Some participants don't take part in the discussion • Facilitator lets the discussion regularly get off track without attempting to refocus it • Participants look bored • Participants must continually query the facilitator for guidance • Participants are confused and don't know what is expected of them • Facilitator is too rehearsed and does not improvise • Facilitator reads directly from the discussion guide • Participants are not challenged by the facilitator to make concrete decisions	• Discussion moves smoothly at a pace that is comfortable for all participants • All participants are able to contribute to the discussion • Transitions go unnoticed • Facilitator asks insightful questions • Participants understand the situation and what is expected of them • Facilitator appears experienced and confident • Facilitator encourages participants to consider all options and challenge one another's assumptions • Facilitator encourages participants to make decisions	• Discussion moves too quickly for participants to follow • Facilitator interrupts or cuts participants off while they are talking • Facilitator talks more than participants • Participants feel rushed • Participants feel patronized or intimidated • Participants look exasperated or frustrated • Participants feel facilitation was too "classroom" like • Facilitator makes decisions for participants • Facilitator interjects tangential comments at inappropriate times

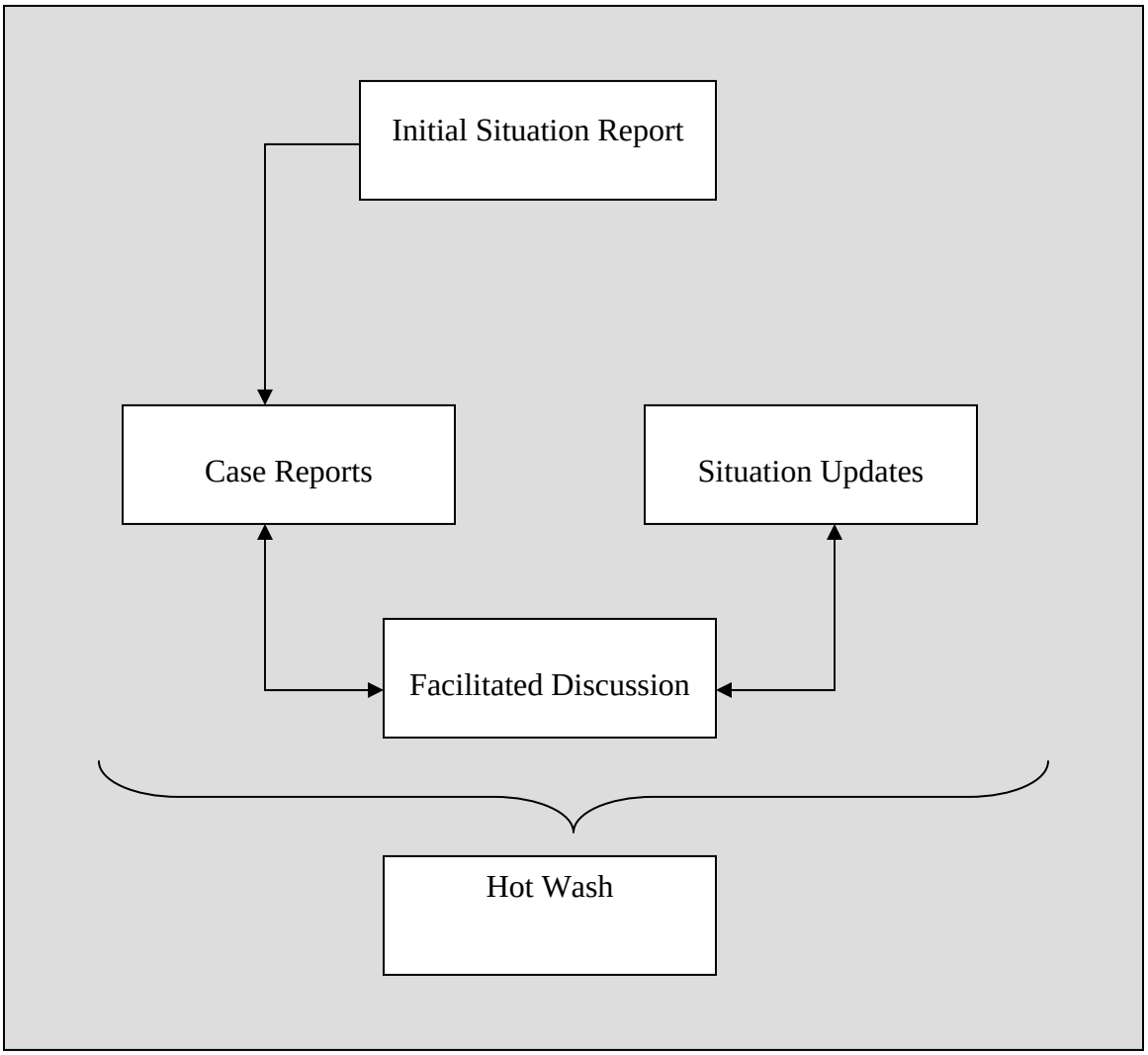
Chapter 4.
Conducting an Exercise

BROAD FRAMEWORK FOR CONDUCTING AN EXERCISE

The exercises in this manual were designed to generate an open and candid discussion. There is no rigid structure for any exercise. Exercises do, however, follow the broad framework outlined in Figure 4.1.

All exercises begin with an initial situation report. All exercises also have case reports (calls placed to the health department from healthcare workers who are reporting on a case or cases that they believe might have public health importance). After each case report, there is discussion regarding the actions the participants would take to address the case report. During the exercise, periodic situation updates provide participants with additional information to consider in their response, such as results from an epidemiological or laboratory investigation or the emergence of additional cases.

Figure 4.1 Framework for Conducting an Exercise



INITIAL SITUATION REPORT

The initial situation report sets up the entire exercise. This report provides the context for everything that happens during the exercise, and will influence participants' options throughout. It is therefore vital that the initial situation report be carefully reviewed at the outset of the exercise. There are three different options for initial situation reports:

- Option 1 (outbreak within the jurisdiction) —A localized disease outbreak originating in the health department's jurisdiction. Reflecting reality, this initial situation report may be ambiguous. The initial situation report also provides general information about the environment prior to the outbreak.
- Option 2 (outbreak within the region) —A regional outbreak that occurs first in a region close to but outside of the jurisdiction of the health department. The initial situation report details reports received by the local health department about the outbreak in the nearby region.
- Option 3 (distant outbreak) —A statewide outbreak that occurs in a state that is not geographically close to the health department (e.g., a state that does not share a border with the health department's state). The initial situation report details reports received by the local health department about the outbreak in the distant state.

As discussed in Chapter 2, the exercise organizer chooses and can tailor the exercise template used for an exercise based on perceived local training or assessment requirements, the local environment, and the relationship between the local health department and the regional or state health department.

If the health department is part of a major metropolitan area, all three of the above situations may be relevant. Major metropolitan areas typically receive heavy amounts of traffic from all over the country. As a result local health departments in these areas may interpret any outbreak, anywhere in the country (or the world, for that matter) as having the same level of threat as a local outbreak, and may respond with immediate surveillance and other appropriate activities. In rural health districts, the distinction between Situation 2 and Situation 3 may involve a different initial response (e.g., active surveillance for Situation 2, versus a less proactive "watch and wait" strategy for Situation 3).

CASE REPORTS

All exercises present participants with a series of 2-3 case reports that are received by the health department. The goal of these case reports is to elicit discussion from the participants about what steps they would take to address the issues raised by the reports. The facilitator guides the discussion about the case reports and answers any questions the participants might have about them. The discussion guide for some exercises provides clinical background stories about more complicated cases so that the facilitator is better able to answer questions from the participants about these cases.

In some instances, participants may ask questions that cannot be answered with the information provided in the exercise. For example, they may ask what the test results

were for a particular test. (The facilitator should respond that the test results are not yet available.) Detecting and responding to outbreaks more often than not involves acting in an environment of uncertainty. The facilitator should encourage participants to work around uncertainties and develop their response with the information they have, recognizing that they will very often not have all the information they would like to have.

Each exercise has three detailed case reports. Each case report contains patient information in seven different domains:

- Age
- Gender
- Ethnicity
- Language
- Comorbidities
- Symptoms
- Limited test results

Case reports provide participants with information to begin discussing how they would deal with each of the cases and to consider how each patient's characteristics may influence their investigation. For example, a non-English-speaking patient will require the health department staff to find a way to communicate.

In addition, some minority communities may respond to the health department disease investigation with skepticism and fear which could complicate contact tracing, collecting environmental and biological samples, and adherence to key public health recommendations.

The first case report presented in every exercise is often intentionally vague, requiring participants to consider a variety of explanations for what might be wrong with the patient and determine whether it rises to the level of being "actionable". The second case provides more clues; however, the explanation is often still not immediately apparent.

The third case should provide participants with the final information they need to begin establishing a case definition and determining if the cases are related. The cases are presented in this way to get participants to discuss how they would learn about the cases in their own communities and possibly link them.

SITUATION UPDATES

All exercises have at least one situation update that presents new information on the progress of the investigation. The situation updates keep the discussion moving forward, and require participants to respond with flexibility to "real-life" developments. There are two types of situation updates used in the exercises:

- Information updates
- Complication updates

There are three different kinds of information updates:

- Participants are updated about the status of one or more of the case reports they received earlier. The update gives additional information (e.g., laboratory test results, health status of cases, etc.) that can aid in developing the case definition.
- Participants are given initial results from the active surveillance efforts. This update provides information about possible additional cases and the extent of the outbreak (e.g., the number of patients in the local hospital emergency department matching the case definition, etc.).
- Participants receive information from the epidemiologic investigation that provides clues about the origin of the outbreak (e.g., the results of contact tracing, information from sanitarians in the field, etc.).

Complication updates present participants with one or more complications that must be addressed. There are three different kinds of complication updates:

- Participants are told about a press leak or inquiry from the media regarding the outbreak, forcing them to consider how they will deal with the media (e.g., need for press releases, need for a consistent message, etc.).
- Participants are told about staffing difficulties in the health department (e.g., staff not showing up for work, staff reporting that they are exhausted from working so much, etc.).
- Participants are told about public anxiety over the outbreak (e.g., problems of crowd control, looting, etc.).

Participants should discuss how they will address the problem raised by the update and how that problem might complicate their investigation.

In addition to situation updates, long exercises also include several brief scenarios that enable participants to discuss a wider range of issues than can be done in the short or medium exercises without forcing participates to re-discuss topics already covered (e.g., initiating active surveillance, establishing a case definition, etc.).

HOT WASH

All exercises end with a "hot wash" -- a time period reserved for participants to discuss the exercise itself and how the group responded to it. The hot wash allows participants to receive feedback from the facilitator as well as one another. The hot wash reinforces learning by:

- Giving participants time to reflect on their individual responses and the group's responses to the exercise
- Allowing participants to hear other peoples' perspectives and views about the quality of responses developed during the exercise

Participants can also learn from the facilitator who can:

- Provide participants with feedback on how their responses might have differed
- Outline the strengths and weaknesses of the responses

Chapter 5.
Using Exercises for Continuous Quality Improvement

OVERVIEW

There are only a few examples of performance measurement in local public health agencies (Dausey et al., 2005, Lurie et al., 2004, Reedy et al., 2005). This manual provides health departments with tools that can be used for training and assessment of public health preparedness, with the ultimate goal of improving public health preparedness through performance measurement. To achieve this goal, the exercise templates in this manual have been designed so that they can be regularly used as part of a system of continuous quality improvement (CQI). CQI is a term used to describe a comprehensive management philosophy, emphasizing the continuous improvement of work processes for improved outcomes.

The exercises in this manual can also be used to help ensure that even a well-prepared health department maintains its level of skill and competency in the face of:

- Staff turnover
- New threats (e.g., emerging diseases, bioterrorism threats, etc)
- Changes in laws or procedures related to public health
- Infrastructure changes in public health (e.g., new computer systems, etc).

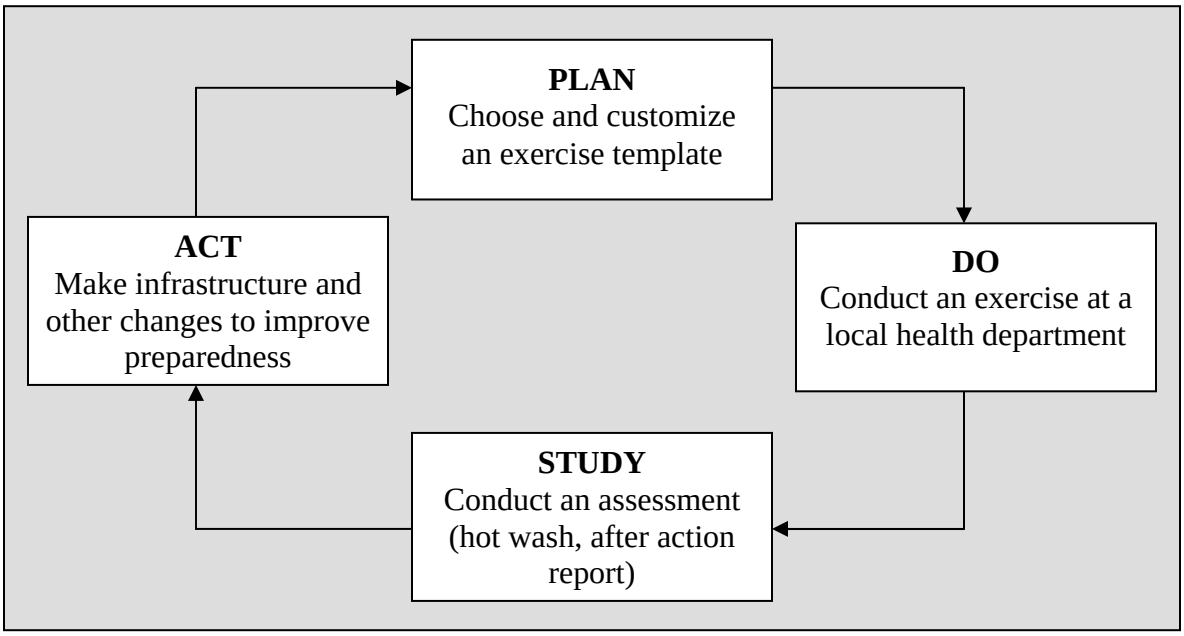
Local health departments that are part of a regional or state public health structure may also consider developing an exercise program with other local health departments in their region. This may be a particularly useful strategy for local health departments that are part of a loosely based, decentralized structure requiring collaboration during a disease outbreak. These departments could use this manual to develop tabletop exercises that assess the ability of several local health departments to function together as a unit. In this section, a framework for all of these activities is suggested using the Plan-Do-Study-Act Model as outlined in Figure 5.1.

PLAN-DO-STUDY-ACT

Throughout this manual we have discussed strategies for planning and conducting a successful exercise. Chapter 2 highlighted pragmatic details for planning an exercise such as staffing and scheduling. Chapters 3 and 4 explained how to train to conduct an exercise and the process for conducting an exercise. These chapters provide a framework to complete the first two steps of the Plan-Do-Study-Act model.

The last two steps of the model focus on reviewing and reflecting on the exercise and making changes based on lessons learned. There are a number of different ways to review and reflect on an exercise. Chapter 4 briefly discussed the idea of a “hot wash” session immediately after an exercise, so participants can openly reflect on the strengths and weaknesses of the exercise and their own performance while the experience is fresh in their minds.

Figure 5.1 Plan-Do-Study-Act Framework



Another way to aid in the learning process after an exercise is to generate an after action report summarizing the exercise and highlighting the health department's strengths and areas for improvement. There is no specific or formal format for such a report. After-action reports can include brief summaries of the exercise as well as bulleted lists of strengths and areas for improvement highlighted from the exercise (e.g., by the issue areas covered in the exercise; see Figure 1.1).

A health department that decides to generate an after action report may find it useful to circulate the report to participants and then meet to discuss it. Such a meeting is useful because unlike the hot wash session, participants will have had more time to consider their performance during the exercise.

Once participants of an exercise have had time to discuss the strengths and weaknesses of an exercise, they should consider how these weaknesses should be addressed. Sometimes weaknesses can be addressed with minor changes; other times, more substantial changes are necessary. Whether the changes are big or small, their effectiveness should be assessed by conducting exercises over time and assessing improvement. The CDC recommends health departments engage in these types of exercises at least once each year.

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APPENDIX A
Short Exercises

A1. Anthrax Short Exercise Template 21

A2. Botulism Short Exercise Template 26

A3. Plague Short Exercise Template 31

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A1. Anthrax Short Exercise Template

OVERVIEW

This tabletop exercise is one exercise in a suite of exercises that have been developed to aid health department officials in assessing the ability of their department to effectively respond to a bioterrorism (BT) event. Each exercise in the suite focuses on a different type of bioterrorism event such as a bacterium, toxin, or virus. This exercise focuses on the purposeful spread of a bacterium-- aerosol anthrax -- in a population of people. The exercise will take approximately 2 hours to complete.

OBJECTIVES

Assess the ability of the health department in the areas of:

- *Surveillance and Detection*
  - Use of existing surveillance systems to detect potential outbreaks
  - Initiation of active surveillance
- *Diagnosis and Investigation*
  - Establishing a case definition
  - Clinical and laboratory investigations
  - Epidemiologic investigation

Elements required to meet these objectives appear as checklists at the end of the suite of short exercises.

EXERCISE MANAGEMENT

Two individuals are needed to conduct this exercise:

- A facilitator who conducts the exercise and, as necessary, offers probes to the participants (The purpose of the probes is to keep the discussion moving forward, and to focus the discussion if it moves off track.)
- A note taker to take notes during the exercise.

Participants

Local health department staff:

- Health director
- Communicable disease control director
- Bioterrorism coordinator
- Epidemiologist
- Representative from a public health laboratory
- Public health nurse(s)

Materials Needed for the Exercise

- Conference room able to seat 5-10 people
- Computer with MS PowerPoint and projector (optional)
- Marker board, flip board, or chalkboard
- Copies of exercise materials to give to participants
- Refreshments (e.g., coffee, water, etc.)

Initial Situation Report

[Customize the exercise template by choosing <u>one</u> of the below three options for the initial situation report]

<u>Option 1</u> (Outbreak within the jurisdiction) —A localized disease outbreak originating in the health department's jurisdiction.

July 15, **[year]**:
- ✓ **[Local area]** is locked in a continuing heat wave with daytime high temperatures expected to exceed **[number]** degrees Fahrenheit
- ✓ Summer vacation traffic is high and air quality is poor
- ✓ The health department has been receiving a steady stream of calls with reports of dehydration, especially among infants and elderly
- ✓ Some of the elderly patients have developed respiratory distress and two have died
- ✓ Senior centers have begun to distribute fans to elderly citizens without air conditioning

If Option 1 is chosen, the facilitator should immediately begin discussing the first case report after the initial situation report

<u>Option 2</u> (Outbreak within the region) —A regional outbreak that occurs first in a region close to but outside of the jurisdiction of the health department.

July 15, **[year]**
[Local health department] officials receive an alert via the Health Alert Network about an outbreak of anthrax in nearby **[region]**. The alert cautions health departments in the region to be on the look out for patients with respiratory illnesses.

If Option 2 is chosen, the facilitator should allow participants to discuss what (if anything) they would do if they received such an alert. *[Consider using active surveillance probes listed after the first case report]*

<u>Option 3</u> (Distant outbreak) —A statewide outbreak that occurs in a state not geographically close to the health department.

July 15, **[year]**
The Associated Press reports that **[distant state]** has an anthrax outbreak that has affected **[number]** people. The state health department is still trying to identify the cause of the outbreak however bioterrorism is strongly suspected.

If Option 3 is chosen, the facilitator should allow participants to discuss what (if anything) they would do had they received such information.

Case Reports

Facilitator Dialogue

Who is responsible for receiving case reports today? *[To identified person]:* You receive the following case report at 4:00pm (July 26) from an emergency medicine doctor at **[local hospital]**

July 26, a 56yo African American male presented to the emergency department at 9:20 AM after reportedly being unable to get an appointment with his primary care physician.

- ✓ He had 2 days of fever, malaise, purulent cough and drenching night sweats.
- ✓ He was found to be hypotensive and tachypneic
- ✓ While he could still talk, he said he'd had a heart attack 2 years ago, and he had chest pain radiating to both shoulders.
- ✓ He was intubated. CXR was consistent with pulmonary edema and showed an unexpectedly wide mediastinum, and bilateral pleural effusions, L>R.
- ✓ ECHO did not show wall motion abnormality or dissecting aneurysm.
- ✓ Plural effusions were grossly bloody. Sputum gram stain revealed gram-positive bacilli.

Facilitator Probes

[To identified person]

- What other information (if any) would you like to have from the caller?
- What advice (if any) would you give the caller?
- Who in the health district would you contact regarding the case? What would you tell them?

[To all participants]

- Who would assume responsibility and take charge at this point?

[The designated official should be encouraged to take charge of the discussion]

- Can you outline the main steps you would take?

[These probes relate to active surveillance. If this was discussed during the initial situation report, move on.]

- At this point would you do anything to try to identify if there are more cases?
- Which entities would you need to contact to initiate active surveillance? What are you going to tell them?
- How would you do active surveillance in vulnerable populations?
- What would you do with potential or suspicious cases that you identified?
- How would you aggregate information on suspicious cases?
- What percentage of physicians in your community could you contact?
- Would your active surveillance include a general public health advisory?

Facilitator Dialogue

Who else here might handle a case report if *[the person responding to the first case report]* is not available? *[To identified person]* You receive the following case report at 3:00pm on the next day (July 27) from the nursing director of the ICU at **[local hospital]**

[If the local health department is large enough that it has more than one affiliated hospital choose a different hospital than the one that is used for the first case report]

On July 25, a 19yo white male in a summer program at **[local university]** presented to the student health center with a fever of 100.5 degrees and sore throat. He failed to improve after 2 days

- ✓ On exam, appeared tanned and healthy, but had unilateral cervical adenopathy and two ulcerations at the base of his tongue
- ✓ Rapid strep test was negative and he was sent home with ibuprofen
- ✓ A day later (July 26) he returned to the student health center with increased pain and more difficulty breathing
- ✓ The ulcerations were beginning to necrose, and he appeared to have impending airway obstruction
- ✓ He was sent to **[local hospital]** and admitted for more tests
- ✓ The ENT consultant biopsied the patient's tongue lesions
- ✓ Today (July 27) gram positive bacilli were noted on culture specimens.

Facilitator Probes

[To identified person]

- What other information (if any) would you like to have from the caller?
- What advice (if any) would you give the caller?
- How if at all would you know about the first case reported the day before?

[To all participants]

- How would you begin thinking about establishing a case definition?
- When (if at all) would there be a meeting of the core local health department team who would respond to this problem? What happens at that meeting? How are activities coordinated among staff?
- When (if at all) would you contact your state health department and what would you tell them?
- What contact (if any) would local health department staff have with patients or their families? (e.g., would staff call cases on the phone, conduct medical record reviews or personally visit the cases and possibly collect samples)
- Who is in charge of dealing with lab samples?
- Where do lab samples get sent?
- How are lab samples packaged and delivered?
- Where do hospitals send lab samples?

Facilitator Dialogue:
How does the health department triage case reports that come in after hours? Who here might receive a case report after hours? *[To identified person]* You are woken at 11:45pm on July 27 and receive the following case report from an emergency department physician at **[local hospital]**:

On July 26, a 55yo Hispanic male presented to **[local hospital]**
- ✓ He did not speak English and required a translator
- ✓ He reported 3 days of fever, chills, malaise and chest heaviness
- ✓ He had a slight, unproductive cough
- ✓ He has a 20 year pack-a-day smoking history
- ✓ He returned recently from visiting family for 6 wks in Mexico, but denied contact with ill people or ingestion of unusual foods
- ✓ He has a history of positive PPD
- ✓ Chest X-ray showed widened mediastinum and hilar adenopathy, but no discreet cavity
- ✓ He was given a mask and sent for induced sputums
- ✓ Tonight (July 27) he appeared confused and became more tachypneic and daughter noticed an episode of melena. Lumbar puncture revealed bloody CSF with many WBC and occasional gram positive bacilli.

Facilitator Probes
[To identified person]
- If you received a call like this after hours, what would you do?
- Would you wait until the morning to handle the situation or is it urgent enough to deal with immediately?

[To all participants]
- How would you deal with non-English speaking populations in your investigation?
- How would you reach out to minority communities?
- What would you like to know (if anything) from the family members of cases?
- How would you begin to connect the dots between the cases?

End of Exercise A1

A2. Botulism Short Exercise Template

OVERVIEW

This tabletop exercise is one exercise in a suite of exercises that have been developed to aid health department officials in assessing the ability of their department to effectively respond to a bioterrorism (BT) event. Each exercise in the suite focuses on a different type of bioterrorism event such as a bacterium, toxin, or virus. This exercise focuses on the purposeful spread of a toxin -- botulism -- in a population of people. The exercise will take approximately 2 hours to complete.

OBJECTIVES

Assess the ability of the health department in the areas of:

- *Surveillance and Detection*
  - Use of existing surveillance systems to detect potential outbreaks
  - Initiation of active surveillance
- *Diagnosis and Investigation*
  - Establishing a case definition
  - Clinical and laboratory investigations
  - Epidemiologic investigation

Elements required to meet these objectives appear as checklists at the end of the suite of short exercises.

EXERCISE MANAGEMENT

Two individuals are needed to conduct this exercise:

- A facilitator who conducts the exercise and, as necessary, offers probes to the participants. (The purpose of the probes is to keep the discussion moving forward, and to focus the discussion if it moves off track.)
- A note taker to take notes during the exercise.

Participants

Local health department staff:

- Health director
- Communicable disease control director
- Bioterrorism coordinator
- Epidemiologist
- Representative from a public health laboratory
- Public health nurse(s)

Materials Needed for the Exercise

- Conference room able to seat 5-10 people
- Computer with MS PowerPoint and projector (optional)
- Marker board, flip board, or chalkboard
- Copies of exercise materials to give to participants
- Refreshments (e.g., coffee, water, etc.)

Initial Situation Report

[Customize the exercise template by choosing <u>one</u> of the below three options for the initial situation report]

<u>Option 1</u> (Outbreak within the jurisdiction) —A localized disease outbreak originating in the health department's jurisdiction.

February **[year]**:
- ✓ There have been floods in **[local area]** due to inclement weather
- ✓ **[Local health department]** staff have been aiding flood victims
- ✓ **[Local health department's]** telephone line has been busy with a steady stream of calls about flood victims.

If Option 1 is chosen, the facilitator should immediately begin discussing the first case report after the initial situation report.

<u>Option 2</u> (Outbreak within the region) —A regional outbreak that occurs first in a region close to but outside of the jurisdiction of the health department.

February **[year]**
[Local health department] officials receive an alert via the Health Alert Network about an outbreak of botulism in nearby **[region]**. The alert cautions health departments in the region to be on the look out for patients with signs and symptoms associated with botulism.

If Option 2 is chosen, the facilitator should allow participants to discuss what (if anything) they would do if they received such an alert. *[Consider using active surveillance probes listed after the first case report]*

<u>Option 3</u> (Distant outbreak) —A statewide outbreak that occurs in a state that is not geographically close to the health department.

February **[year]**
The Associated Press reports that **[distant state]** has a botulism outbreak that has affected **[number]** people. The state health department is still trying to identify the cause of the outbreak; however initial evidence points to bioterrorism.

If Option 3 is chosen, the facilitator should allow participants to discuss what (if anything) they would do if they received such information.

Case Reports

Facilitator Dialogue

Who is responsible for receiving case reports today? *[To identified person]* You receive the following case report at 9:00am this morning from the medical examiner who is at **[local hospital]:**

March 1, a 65-year-old white male was brought to the emergency room this morning at 8:15am after complaining of blurred vision and slurred speech. He has a history of a prior MI and atrial fibrillation, and takes warfarin and a beta blocker. He reported generally had been feeling well, and played badminton with his grandchildren at a church picnic the day before.

- ✓ He did not report any chest pain, palpitations, or headache. In the emergency department, he was alert but his speech was slurred.
- ✓ His visual acuity was 20/40 in both eyes, but his eyelids were drooping (ptosis) bilaterally and his pupils were mildly dilated. His gag reflex was diminished. Sensation, motor strength in his arms and legs, and deep tendon reflexes however were intact.
- ✓ While getting an MRI, he aspirated on his secretions, and had a respiratory arrest. He was intubated. MRI was negative for stroke, and he was admitted to the ICU.
- ✓ In the last several hours, he has developed weakness in his upper extremities. Myasthenia was suspected but a Tensilon test is negative.

Facilitator Probes

[To identified person]

- What other information (if any) would you like to have from the caller?
- What advice (if any) would you give the caller?
- Who in the health district would you contact regarding the case? What would you tell them?

[To all participants]

- Who would assume responsibility and take charge at this point?

[The designated official should be encouraged to take charge of the discussion]

- Can you outline the main steps you would take?

[These probes relate to active surveillance. If this was discussed during the initial situation report, move on.]

- At this point would you do anything to try to identify if there are more cases?
- Which entities would you need to contact to initiate active surveillance? What are you going to tell them?
- How would you do active surveillance in vulnerable populations?
- What would you do with potential or suspicious cases that you identified?
- How would you aggregate information on suspicious cases?
- What percentage of physicians in your community could you contact?
- Would your active surveillance include a general public health advisory?

Facilitator Dialogue

Who else here might handle a case report if *[the person responding to the first case report]* is not available? *[To identified person]* You receive the following case report at 3:00pm on the same day from an infection control practitioner at **[local hospital]**:

March 1, a 22-year-old **[local university]** student was brought to **[local immediate care center]** at 8:30am complaining of double vision. Her roommate noted that she has slurred speech and her pupils are dilated. She had been at a rowdy party the night before and had returned about 4am.

- ✓ At first her roommate suspected that she was simply hung over, but began to get worried when she noted the dilated pupils and slurred speech that she had been given drugs at the party. The roommate was concerned that her friend had been abused at the party so brought her to **[local immediate care center]**.
- ✓ The patient was difficult to understand, but denied having been raped, and indicated she had only had 2 beers. The patient's speech became progressively more slurred during the history, and her speech was unintelligible.
- ✓ On exam she was afebrile with stable vital signs. Heart and lungs were normal, but there were only rare bowel sounds. A quick neurological exam noted bilateral ptosis and 6th nerve palsies. A gag reflex was absent. The patient began to drool and hyperventilate, and was intubated prophylactically. She was then transferred urgently to **[local hospital]** at 10:20am.
- ✓ Blood and urine tox screens were negative. Blood alcohol was less than .05. Over the ensuing few hours the patient developed progressive weakness of her neck and upper extremities. An LP was performed, and was unremarkable. A neurology consultant has been called. The nursing director of the ICU calls the health department because he believes this patient may have had a bizarre drug ingestion.

Facilitator Probes

[To identified person]

- What other information (if any) would you like to have from the caller?
- What advice (if any) would you give the caller?
- How if at all would you know about the first case reported earlier in the day?

[To all participants]

- How would you begin thinking about establishing a case definition?
- When (if at all) is there a meeting of the core local health department team who would respond to this problem? What happens at that meeting? How are activities coordinated among staff?
- When (if at all) would you contact your state health department and what would you tell them?
- What contact (if any) would local health department staff have with patients or their families (e.g., would staff call cases on the phone, conduct medical record reviews or personally visit the cases and possibly collect samples)?
- Who is in charge of dealing with lab samples?
- Where do lab samples get sent?

- How are lab samples packaged and delivered?
- Where do hospitals send lab samples?

Facilitator Dialogue

How does the health department triage case reports that come in after hours? Who here might receive a case report after hours? *[To identified person]* You are woken at 11:45pm and receive the following case report from an ED physician at **[local hospital]**:

March 1, a 34 year old Hispanic male who speaks little English calls 911 from **[local high school]** where he works as a janitor, because he is experiencing blurred vision, dry mouth and shortness of breath. He has a history of bipolar disorder and panic attacks. Although his mental illness has been well controlled with lithium, he is alarmed by his symptoms and is worried that he is having a panic attack or becoming manic. He has taken an extra dose of clonazepam, but does not feel any better.

- ✓ He was taken to **[local hospital]**. An EMS staff member on the ambulance noted that he was afebrile, had normal vital signs, but had somewhat slurred speech. He remarked to the ED physician that this is the 3rd case of this he has seen that day, and jokingly asks if there's a full moon.
- ✓ In the emergency room the patient appeared frightened, his pupils were dilated bilaterally, and he had bilateral 3rd and 6th and 7th nerve palsies. His shoulder muscles were weak, although the remainder of his upper extremities and lower extremities were normal.
- ✓ Despite his seemingly vehement denials, the ED staff were worried about a drug ingestion given his history of mental illness, and placed an NG tube for charcoal lavage. He vomited, aspirated and was intubated.
- ✓ He was initially agitated, waving his arms for attention, but over last several hours he has become spontaneously less so. He is currently unable to move his arms on command, but is able to move his legs. Strength and sensation are normal in the lower extremities.
- ✓ The ED physician had recently returned from a CME program on bioterrorism, and calls to ask if you've had any similar reports.

Facilitator Probes

[To identified person]

- If you received a call like this after hours, what would you do?
- Would you wait until the morning to handle the situation or is it urgent enough to deal with immediately?

[To all participants]

- How would you deal with non-English speaking populations in your investigation?
- How would you reach out to vulnerable communities?
- What would you like to know (if anything) from the family members of cases?

End of Exercise A2

A3. Plague Short Exercise Template

OVERVIEW

This tabletop exercise is one exercise in a suite of exercises that have been developed to aid health department officials in assessing the ability of their department to effectively respond to a bioterrorism (BT) event. Each exercise in the suite focuses on a different type of bioterrorism event such as a bacterium, toxin, or virus. This exercise focuses on the purposeful spread of a virus-- plague -- in a population of people. The response to a plague case(s) might vary depending whether the health department is in a plague endemic area. The exercise will take approximately 2 hours to complete.

OBJECTIVES

Assess the ability of the health department in the areas of:

- *Surveillance and Detection*
  - Use of existing surveillance systems to detect potential outbreaks
  - Initiation of active surveillance
- *Diagnosis and Investigation*
  - Establishing a case definition
  - Clinical and laboratory investigations
  - Epidemiologic investigation

Elements required to meet these objectives appear as checklists at the end of the suite of short exercises.

EXERCISE MANAGEMENT

Two individuals are needed to conduct this exercise:

- A facilitator who conducts the exercise and, as necessary, offers probes to the participants; the purpose of the probes is to keep the discussion moving forward, and to focus the discussion if it moves off track.
- A note taker to take notes during the exercise.

Participants

Local health department staff:

- Health director
- Communicable disease control director
- Bioterrorism coordinator
- Epidemiologist
- Representative from a public health laboratory
- Public health nurse(s)

Materials Needed for the Exercise

- Conference room able to seat 5-10 people
- Computer with MS PowerPoint and projector (optional)
- Marker board, flip board, or chalkboard
- Copies of exercise materials to give to participants
- Refreshments (e.g., coffee, water, etc.)

Initial Situation Report

[Customize the exercise template by choosing <u>one</u> of the below three options for the initial situation report]

<u>Option 1</u> (Outbreak within the jurisdiction) —A localized disease outbreak originating in the health department's jurisdiction.

June **[year]**:
- ✓ **[Local area]** is locked in a continuing heat wave with daytime high temperatures expected to over **[number]** degrees Fahrenheit
- ✓ Summer vacation traffic is high and air quality is poor
- ✓ The health department has been receiving a steady stream of calls with reports of dehydration, especially among infants and elderly
- ✓ Some of the elderly patients have developed respiratory distress and two have died
- ✓ Senior centers have begun to distribute fans to centers without air conditioning.

If Option 1 is chosen, the facilitator should immediately begin discussing the first case report after the initial situation report

<u>Option 2</u> (Outbreak within the region) —A regional outbreak that occurs first in a region close to but outside of the jurisdiction of the health department.

June **[year]**
[Local health department] officials receive an alert via the Health Alert Network about an outbreak of plague in nearby **[region]**. The alert cautions health departments in the region to be on the lookout for patients with respiratory illnesses.

If Option 2 is chosen, the facilitator should allow participants to discuss what (if anything) they would do if they received such an alert. *[Consider using active surveillance probes listed after the first case report]*

<u>Option 3</u> (Distant outbreak) —A statewide outbreak that occurs in a state that is not geographically close to the health department.

June **[year]**
The Associated Press reports that **[distant state]** has a plague outbreak that has affected **[number]** people. The state health department is still trying to identify the cause of the outbreak; however bioterrorism is strongly suspected.

If Option 3 is chosen, the facilitator should allow participants to discuss what (if anything) they would do if they received such information.

Case Reports

Facilitator Dialogue

Who is responsible for receiving case reports today? *[To identified person]* You receive the following case report at 9:00am this morning from an emergency medicine doctor who is at **[local hospital]:**

> June 26, a 10 year-old male child is brought to the **[local emergency room]** with shortness of breath, a cough and blood-tinged sputum. He is accompanied by his mother, who works as a housekeeper in **[local area]**. The mother speaks little English but is also coughing. Both are from Guatemala. They are given masks, and asked to wear them while sputum examinations are pending. The boy is admitted to the hospital after he is found to be febrile and have a cavitary lesion on his chest x-ray. The mother has no health insurance and refuses a chest x-ray. A PPD test was placed on the child. AFB smears are preliminarily negative. You receive a call about a suspicious case of TB in a school-age child.

[Clinical background story: While this case could well be plague, it is most likely to be TB. However, the shortness of breath, cough and blood-tinged sputum are non-specific enough that you would catch this if doing active surveillance for plague. The suspicion about plague increases once the AFB smears are negative, although that does not definitively rule out TB either.]

Facilitator Probes

[To identified person]

- What other information (if any) would you like to have from the caller?
- What advise (if any) would you give the caller?
- Who in the health district would you contact regarding the case? What would you tell them?

[To all participants]

- Who would assume responsibility and take charge at this point?

[The designated official should be encouraged to take charge of the discussion]

- Can you outline the main steps you would take?
- How would you handle the language barrier?

[These probes relate to active surveillance. If this was discussed during the initial situation report, move on.]

- At this point would you do anything to try to identify if there are more cases?
- Which entities would you need to contact to initiate active surveillance? What are you going to tell them?
- How would you do active surveillance in vulnerable populations?
- What would you do with potential or suspicious cases that you identified?
- How would you aggregate information on suspicious cases?
- What percentage of physicians in your community could you contact?
- Would your active surveillance include a general public health advisory?

Facilitator Dialogue

Who else here might handle a case report if *[the person responding to the first case report]* is not available? *[To identified person]* You receive the following case report at 3:00pm on the same day from the infection control practitioner at **[local hospital]**:

June 26, a 72-year-old man with a history of recurrent congestive heart failure (CHF) is admitted to **[hospital]** with a cough and bloody sputum.

- ✓ He has obvious signs of fluid overload and is clinically in heart failure.
- ✓ He has a history of multiple admissions for CHF, often due to running out of medicines at the end of the month.
- ✓ The patient has no fever, and has no recent travel history.

You are called only because the ICU physician has been asked by the hospital infection control staff to report any cases of cough and bloody sputum. Sputum gram stain was over de-colorized, but negative.

[Clinical background story: This patient came to attention because he had cough and bloody sputum. You cannot rule out plague, but it is not as likely as simple heart failure.]

Facilitator Probes

[To identified person]

- What other information (if any) would you like to have from the caller?
- What advice (if any) would you give the caller?
- How if at all would you know about the first case reported earlier in the day?

[To all participants]

- How would you begin thinking about establishing a case definition?
- When (if at all) is there a meeting of the core local health department team who would respond to this problem? What happens at that meeting? How are activities coordinated among staff?
- When (if at all) would you contact your state health department and what would you tell them?
- What contact (if any) would local health department staff have with patients or their families (e.g., would staff call cases on the phone, conduct medical record reviews or personally visit the cases and possibly collect samples)?

Facilitator Dialogue

How does your health department triage case reports that come in after hours? Who here might receive a case report after hours? *[To identified person]* You are woken at 11:45pm and receive the following case report from an ED physician at **[local hospital]**:

June 26, a 42-year-old flight attendant reports for work at **[local airport]**. While waiting for his aircraft to arrive, he suddenly feels flushed, and over the next hour feels feverish and slightly confused. By the time he should board his plane, he feels too sick and weak to fly.

- ✓ He is sent to the emergency room at **[local hospital]**, where he is found to be hypotensive, and tachypneic.
- ✓ While still able to talk, he says he is HIV positive, on meds, and that his last viral load was low.
- ✓ He becomes too tachypneic to talk, and is intubated.
- ✓ CXR was consistent with ARDS.
- ✓ Sputum gram stain revealed gram-negative bacilli.
- ✓ He is currently in the ICU.
- ✓ You are called because of the infectious disease alert sent to your hospital, but the doctor thinks the patient has an AIDS-associated infection.

[Clinical background story: This patient probably has plague. The HIV may have made him more susceptible or made the clinical progression faster. The gram-negative bacilli are consistent with plague, but this could also be another gram-negative pneumonia. But each of these people are"possible cases" and should be considered contagious until proven otherwise.]

Facilitator Probes

[To identified person]

- If you received a call like this after hours, what would you do?
- Would you wait until the morning to handle the situation or is it urgent enough to deal with immediately?

[To all participants]

- Is there anything that would cause you to link all of these case reports together?
- How would you begin to connect the dots?
- What other information would you need?

End of Exercise A3

A4. Smallpox Short Exercise Template

OVERVIEW

This tabletop exercise is one exercise in a suite of exercises that have been developed to aid health department officials in assessing the ability of their department to effectively respond to a bioterrorism (BT) event. Each exercise in the suite focuses on a different type of bioterrorism event such as a bacterium, toxin, or virus. This exercise focuses on the purposeful spread of a virus -- smallpox -- in a population of people. The exercise will take approximately 2 hours to complete.

OBJECTIVES

Assess the ability of the health department in the areas of:

- *Surveillance and Detection*
  - Use of existing surveillance systems to detect potential outbreaks
  - Initiation of active surveillance
- *Diagnosis and Investigation*
  - Establishing a case definition
  - Clinical and laboratory investigations
  - Epidemiologic investigation

Elements required to meet these objectives appear as checklists at the end of the suite of short exercises.

EXERCISE MANAGEMENT

Two individuals are needed to conduct this exercise:

- A facilitator who conducts the exercise and, as necessary, offers probes to the participants (The purpose of the probes is to keep the discussion moving forward, and to focus the discussion if it moves off track.)
- A note taker to take notes during the exercise.

Participants

Local health department staff:

- Health director
- Communicable disease control director
- Bioterrorism coordinator
- Epidemiologist
- Representative from a public health laboratory
- Public health nurse(s)

Materials Needed for the Exercise

- Conference room able to seat 5-10 people
- Computer with MS PowerPoint and projector (optional)
- Marker board, flip board, or chalkboard
- Copies of exercise materials to give to participants
- Refreshments (e.g., coffee, water, etc.)

Initial Situation Report

[Customize the exercise template by choosing <u>one</u> of the below three options for the initial situation report]

<u>Option 1</u> (outbreak within the jurisdiction) —A localized disease outbreak originating in the health department's jurisdiction.

February **[year]**:
- ✓ There have been floods in **[local area]** due to inclement weather.
- ✓ **[Local health department]** staff have been aiding flood victims
- ✓ **[Local health department's]** telephone line has been busy with a steady stream of calls about flood victims

If Option 1 is chosen, the facilitator should immediately begin discussing the first case report after the initial situation report

<u>Option 2</u> (outbreak within the region) —A regional outbreak that occurs first in a region close to but outside of the jurisdiction of the health department.

February **[year]**
[Local health department] officials receive an alert via the Health Alert Network about an outbreak of smallpox in nearby **[region]**. The alert cautions health departments in the region to be on the look out for patients with signs and symptoms associated with smallpox.

If Option 2 is chosen, the facilitator should allow participants to discuss what (if anything) they would do if they received such an alert. *[Consider using active surveillance probes listed after the first case report]*

<u>Option 3</u> (distant outbreak) —A statewide outbreak that occurs in a state that is not geographically close to the health department.

February **[year]**
The Associated Press reports that **[distant state]** has a smallpox outbreak that has affected **[number]** people. The state health department is still trying to identify the cause of the outbreak; however initial evidence points to bioterrorism.

If Option 3 is chosen, the facilitator should allow participants to discuss what (if anything) they would do if they received such information.

Case Reports

Facilitator Dialogue

Who is responsible for receiving case reports today? *[To identified person]* You receive the following case report at 9:00am this morning (March 1) from the medical examiner who is at **[local hospital]:**

February 26, a 40-year-old Hispanic male who works as a maintenance man at **[local school]** presents to the **[local hospital]** with a fever of 102 and vomiting. He speaks very limited English. He improves with antiemetics and is sent home with a diagnosis of viral syndrome.

- ✓ On February 28, he was brought into [hospital A] by ambulance, now with fever, severe headache and rash, and is admitted with a presumptive diagnosis of meningitis.
- ✓ On March 1, he becomes hypotensive and subsequently dies, with cultures/diagnostic tests negative for N. meningitis, bacteria, and herpes. An autopsy is scheduled for March 2. The medical examiner calls the health department because of suspected meningitis.

[Clinical background story: This person may well have smallpox. The presentation could mimic meningitis, but when the cultures are negative it should be clear that he had a different problem. He has unrecognized HIV and that's why he gets sick and dies so fast.]

Facilitator Probes

[To identified person]

- What other information (if any) would you like to have from the caller?
- What advice (if any) would you give the caller?
- Do you recommend the use of PPE?
- Who in the health district would you contact regarding the case? What would you tell them?

[To all participants]

- Who would assume responsibility and take charge at this point?
- How would you deal with the language barrier?

[The designated official should be encouraged to take charge of the discussion]

- Can you outline the main steps you would take?

[These probes relate to active surveillance. If this was discussed during the initial situation report, move on.]

- At this point would you do anything to try to identify if there are more cases?
- Which entities would you need to contact to initiate active surveillance? What are you going to tell them?
- How would you do active surveillance in vulnerable populations?
- What would you do with potential or suspicious cases that you identified?
- How would you aggregate information on suspicious cases?
- What percentage of physicians in your community could you contact?
- Would your active surveillance include a general public health advisory?

Facilitator Dialogue

Who else here might handle a case report if *[the person responding to the first case report]* is not available? You receive the following case report at 3:00pm the same day (March 1) from and infectious disease practitioner at **[local hospital]**:

[If the local health department is large enough that it has more than one affiliated hospital, choose a different hospital than the one that is used for the first case report]

On February 28, a 42-year-old Asian businessman is seen at **[local hospital]** with a fever, headache, and backache. He had been on a recent business trip to Asia, and is admitted with a presumptive diagnosis of malaria.

- ✓ On March 1 he has a negative blood smear for malaria, no response to empirical therapy, and is beginning to develop a rash on his face, arms, and legs.
- ✓ Six other patients have appeared at **[local hospital]** within the last 48 hours with fevers and nascent rashes. The nurse practitioner in the hospital outpatient department thinks this may be odd and reports the cases to the infectious disease practitioner at the hospital. The infectious disease practitioner calls the **[local health department]** to report the cluster and to ask if the health district knows of anything going around.

[Clinical background story: This person could easily have smallpox, a drug reaction, or some other viral rash. A key will be whether all the lesions are in the same stages of development.]

Facilitator Probes

[To identified person]

- What other information (if any) would you like to have from the caller?
- What advice (if any) would you give the caller?
- How if at all would you know about the first case reported earlier in the day?

[To all participants]

- How would you begin thinking about establishing a case definition?
- When (if at all) is there a meeting of the core local health department team who would respond to this problem? What happens at that meeting? How are activities coordinated among staff?
- When (if at all) would you contact your state health department and what would you tell them?
- What contact (if any) would local health department staff have with patients or their families (e.g., would staff call cases on the phone, conduct medical record reviews or personally visit the cases and possibly collect samples)?

Facilitator Dialogue

How does your health department triage case reports that come in after hours? Who here might receive a case report after hours? *[To identified person]* You are woken at 2:00am and receive the following case report from an ED physician at **[local hospital]**:

February 27, a 21-year-old female student at **[local university]** presents to the Student Health Center with a fever, chills, and headache. She gives a history of a sister with the "flu," and mentions that she has been taking some of her roommate's trimethoprim-sulfa. A nasopharyngeal swab for influenza is performed. She is sent home with instructions to call for results, and with Tylenol for pain and fever.

- ✓ On February 28, the student returns to the **[local university]** student health center with continued fever, and a rash on her face and arms. She is sent to **[local hospital]** and admitted for observation with diagnoses of possible chickenpox versus drug allergy. The influenza test from her previous visit was negative.
- ✓ On March 2, an infectious disease consult is obtained on the student to verify a diagnosis of chickenpox versus drug rash, and to see if any isolation is warranted. The consultant doesn't think that the illness is consistent with varicella; the patient had a prodrome, and all of the lesions on her arms are in the same stage of development. The consultant reviews a dermatology textbook to confirm his clinical recognition, and decides to call the **[local health department]** on the off chance that this represents smallpox.

[Clinical background story: This is likely smallpox. The trimethoprim-sulfa causes a classic drug rash that is easy to distinguish from smallpox. The fact that all of the lesions are in the same stage of development suggests this is not chickenpox.]

Facilitator Probes

[To identified person]

- If you received a call like this after hours, what would you do?
- Would you wait until the morning to handle the situation or is it urgent enough to deal with immediately?

[To all participants]

- Is there anything that would cause you to link all of these case reports together?
- How would you begin to connect the dots?
- What other information would you need?

End of Exercise A4

A5. Checklists for Short Exercises

Preamble

These checklists are designed to be used by both the facilitator to aid in guiding the exercise and to aid in the assessment of exercise performance. The note taker should use the checklists by putting an "X" in a check box if exercise participants covered a checklist topic without being probed. The note taker should put a "/" in the box if the participants covered a checklist topic but only after being probed. The note taker should leave a checkbox empty if participants were probed for a particular checklist item but still never provided a response.

Surveillance and Detection Checklist

Detection

- ☐ Have infrastructure in place to respond to case reports 24/7/365
- ☐ Staff with clinical knowledge are able to respond to case reports

Initiating Active Surveillance

- ☐ Provided concrete details on how to go about initiating active surveillance
- ☐ Would contact a number of different individuals and organizations to assist with active surveillance efforts. Identified what those individuals would be asked to do, and would provide them with working case definition
  - ❑ Epidemiologists
  - ❑ Hospital administrators
  - ❑ Hospital infection control practitioners
  - ❑ Emergency departments (ED physicians, nurses, etc.)
  - ❑ Local physicians (primary care, private practice, etc.)
  - ❑ Law enforcement personnel
  - ❑ EMS
  - ❑ General public
- ☐ Would follow up all new suspected cases and insure that all such cases are monitored by appropriate health department personnel
- ☐ Discussed the process for tracking potential cases
- ☐ Would log all decisions in a log book
- ☐ Would collect and aggregate data on cases
  - ❑ Date of onset of illness
  - ❑ Place where case lives

- Place where case became ill
- Recent travel
- Individual characteristics of cases (age, sex, occupation, etc.)
- Contacts of cases
- Collection and maintenance of the case information in a "line list" format

Diagnosis and Investigation Checklist

Establishing a Case Definition

☐ Discussed clear process for establishing case definition

☐ Identified (have knowledge of) resources such as the state health department and the CDC's websites to aid in developing the case definition

☐ Discussed establishing an initial working case definition
- Kept broad
- Uniform
- Relatively simple
- Timely

☐ Discussed essential elements that would be used in case definition
- Time (date of onset)
- Place
- Person
- Symptoms
- Essential physical signs
- Laboratory confirmation

☐ Would begin to consider how to divide case definition into categories (laboratory confirmed case, probable cases, suspected cases).

☐ Discussed comparing working case definition with existing case definition for other known diseases

☐ Information on possible cases would come from a variety of sources
- Health care personnel (physicians, nurses, EMS, etc.)
- Hospitals
- Schools
- Affected individuals
- Close contacts and family members of affected individuals

☐ Information kept on all cases regardless of whether they are confirmed, probable, possible, or unlikely

- ☐ Data on cases would be collected and stored in a systematic fashion (ideally stored on a microcomputer, with other backup)

Clinical Investigation

- ☐ Would contact state health department to let them know of suspected cases
- ☐ At least one health department epidemiologist or communicable disease specialist would contact cases
- ☐ Personnel who visit suspected cases would wear PPE
- ☐ Participants know the general signs and symptoms to look for when examining suspected cases of anthrax (or botulism, plague or smallpox)
- ☐ Clinical specimens would be collected from every case. Participants know what to collect, how to store it, etc.
- ☐ Participants were clear about how they would handle suspected cases
- ☐ Addressed how to deal with non-English speaking cases
- ☐ Would focus on trying to find out what all of the cases had in common (identifying common source)

Laboratory Investigation

- ☐ Personnel trained in how to prepare, package, and ship hazardous biological materials would be responsible for sending samples to laboratories
- ☐ Participants know where to send specimens
- ☐ Participants understand the chain of custody for specimens
- ☐ Recipient of specimens would be alerted in advance

APPENDIX B
Medium Exercises

B1. Anthrax Medium Exercise Template 45

B2. Botulism Medium Exercise Template.....54

B3. Plague Medium Exercise Template.....63

B4. Smallpox Medium Exercise Template 72

B5. Checklists for Medium and Long Exercises 81

B1. Anthrax Medium Exercise Template

OVERVIEW

This tabletop exercise is one exercise in a suite of exercises that have been developed to aid health department officials in assessing the ability of their department to effectively respond to a bioterrorism (BT) event. Each exercise in the suite focuses on a different type of bioterrorism event such as a bacterium, toxin, or virus. This exercise focuses on the purposeful spread of a bacterium -- aerosol anthrax -- in a population of people. The exercise will take approximately 4 hours to complete. It is divided into two steps. In the first step participants are presented with an outbreak and must first detect the problem and then begin connecting the dots by developing a case definition and conducting an epidemiologic investigation. In the second step participants must interact with other stakeholders involved with the response.

OBJECTIVES

Assess the ability of the health department in the areas of:

- *Surveillance and Detection*
  - Use of existing surveillance systems to detect potential outbreaks
  - Initiation of active surveillance
- *Diagnosis and Investigation*
  - Establishing a case definition
  - Clinical and laboratory investigations
  - Epidemiologic investigation
- *System-Wide Coordination*
  - Handoffs with regional or state health department
  - Coordination of efforts with other local and state actors (e.g., elected officials, law enforcement, etc.)
  - Establishment of an Emergency Operations Center
- *Risk Communication*
  - Effectively communicating essential messages to the public
  - Initiation of a public information campaign
  - Coordination of information to media
- *Disease Control*
  - Prophylaxis and vaccination capabilities
  - Isolation and Quarantine
  - Closing of schools, workplaces, hospitals, etc.

Elements required to meet these objectives appear as checklists at the end of the suite of medium exercises.

EXERCISE MANAGEMENT

Two individuals are needed to conduct this exercise:

- A facilitator who conducts the exercise and, as necessary, offers probes to the participants. (The purpose of the probes is to keep the discussion moving forward, and to focus the discussion if it moves off track.)

- A note taker to take notes during the exercise.

Participants

Step 1 participants:

- Local health department staff only
  - Health director
  - Communicable disease control director
  - Bioterrorism coordinator
  - Epidemiologist
  - Representative from a public health laboratory
  - Public health nurse(s)
  - Public Information Officer (local health department)

Step 2 participants:
All participants from Step 1, and:

- Local Stakeholders
  - Law enforcement
  - EMS personnel
  - Hospital infection control staff
  - Local physicians
  - Minority community leadership
  - Elected officials
  - Emergency Management official

Depending on the local environment and the relationship between the state and local health departments, it may be useful to include regional or state health department staff in an exercise. See Chapter 4 for more details.

Materials Needed for the Exercise

- Conference room able to seat 5-10 people
- Computer with MS PowerPoint and projector (optional)
- Marker board, flip board, or chalkboard
- Copies of exercise materials to give to participants
- Refreshments (e.g., coffee, water, etc.)

Sample Agenda

- 8:00am-8:15am Registration/breakfast
- 8:15am-8:30am Introductions and overview
- 8:30am-9:45am Step 1: Initial response
- 9:45am-10:00am Break/light refreshments
- 10:00am-11:45am Step 2: Intermediate response
- 11:45pm-12:15pm Break/lunch
- 12:15pm-1:30pm Step 3: Hotwash

Step 1

Initial Situation Report
[Customize the exercise template by choosing <u>one</u> of the below three options for the initial situation report. These options are designed to differ in the level of advanced notification that a health department has prior to an outbreak. In option 1 there is no advanced notification and in options 2-3 there is at least some advanced notification.]

<u>Option 1</u> (Outbreak within the jurisdiction) —A localized disease outbreak originating in the health department's jurisdiction.

July **[year]**:
- ✓ **[Local area]** is locked in a continuing heat wave with daytime high temperatures expected to over **[number]** degrees Fahrenheit
- ✓ Summer vacation traffic is high and air quality is poor
- ✓ The health department has been receiving a steady stream of calls with reports of dehydration, especially among infants and elderly
- ✓ Some of the elderly patients have developed respiratory distress and two have died
- ✓ Senior centers have begun to distribute fans to elderly citizens without air conditioning.

If Option 1 is chosen, the facilitator should immediately begin discussing the first case report after the initial situation report

<u>Option 2</u> (Outbreak within the region) —A regional outbreak that occurs first in a region close to but outside of the jurisdiction of the health department.

July **[year]**
[Local health department] officials receive an alert via the Health Alert Network about an outbreak of anthrax in nearby **[region]**. The alert cautions health departments in the region to be on the look out for patients with respiratory illnesses.

If Option 2 is chosen, the facilitator should allow participants to discuss what (if anything) they would do if they received such an alert. *[Consider using active surveillance probes listed after the first case report]*

<u>Option 3</u> (distant outbreak) —A statewide outbreak that occurs in a state that is not geographically close to the health department.

July **[year]**
The Associated Press reports that **[distant state]** has an anthrax outbreak that has affected **[number]** people. The state health department is still trying to identify the cause of the outbreak however bioterrorism is strongly suspected.

If Option 3 is chosen, the facilitator should allow participants to discuss what (if anything) they would do if they received such information.

Case Reports

Facilitator Dialogue
Who is responsible for receiving case reports today? *[To identified person]:* You receive the following case report at 4:00pm (July 26) from an emergency medicine doctor at **[local hospital]**

July 26, a 56yo African American male presented to the emergency department at 9:20 AM after reportedly being unable to get an appointment with his primary care physician.

- ✓ He had 2 days of fever, malaise, purulent cough and drenching night sweats.
- ✓ He was found to be hypotensive and tachypneic
- ✓ While he could still talk, he said he'd had a heart attack 2 years ago, and he had chest pain radiating to both shoulders.
- ✓ He was intubated. CXR was consistent with pulmonary edema and showed an unexpectedly wide mediastinum, and bilateral pleural effusions, L>R.
- ✓ ECHO did not show wall motion abnormality or dissecting aneurism.
- ✓ Plural effusions were grossly bloody. Sputum gram stain revealed gram-positive bacilli.

Facilitator Probes
[To identified person]

- What other information (if any) would you like to have from the caller?
- What advice (if any) would you give the caller?
- Who in the health district would you contact regarding the case? What would you tell them?

[To all participants]

- Who would assume responsibility and take charge at this point?

[The designated official should be encouraged to take charge of the discussion]

- Can you outline the main steps you would take?

[These probes relate to active surveillance. If this was discussed during the initial situation report, move on.]

- At this point would you do anything to try to identify if there are more cases?
- Which entities would you need to contact to initiate active surveillance? What are you going to tell them?
- How would you do active surveillance in vulnerable populations?
- What would you do with potential or suspicious cases that you identified?
- How would you aggregate information on suspicious cases?

- What percentage of physicians in your community could you contact?
- Would your active surveillance include a general public health advisory?

Facilitator Dialogue

Who else here might handle a case report if *[the person responding to the first case report]* is not available? *[To identified person]* You receive the following case report at 3:00pm on the next day (July 27) from the infection control practitioner at **[local hospital]**

[If the local health department is large enough that it has more than one affiliated hospital, choose a different hospital than the one that is used for the first case report]

On July 25, a 19yo white male in a summer program at **[local university]** presented to the student health center with a fever of 100.5 degrees and sore throat. He fails to improve after 2 days

- ✓ On exam, he appeared tanned and healthy, but had unilateral cervical adenopathy and two ulcerations at the base of his tongue
- ✓ Rapid strep test was negative and he was sent home with ibuprofen
- ✓ A day later (July 26) he returned to the student health center with increased pain and more difficulty breathing
- ✓ The ulcerations were beginning to necrose, and he appeared to have impending airway obstruction
- ✓ He was sent to **[local hospital]** and admitted for more tests
- ✓ The ENT consultant biopsied the patient's tongue lesions
- ✓ Today (July 27) gram-positive bacilli were noted on culture specimens.

Facilitator Probes

[To identified person]

- What other information (if any) would you like to have from the caller?
- What advice (if any) would you give the caller?
- How if at all would you know about the first case reported the day before?

[To all participants]

- How would you begin thinking about establishing a case definition?
- When (if at all) is there a meeting of the core local health department team who would respond to this problem? What happens at that meeting? How are activities coordinated among staff?
- When (if at all) would you contact your state health department and what would you tell them?
- What contact (if any) would local health department staff have with patients or their families (e.g., would staff call cases on the phone, conduct medical record reviews or personally visit the cases and possibly collect samples)?
- Who is in charge of dealing with lab samples?
- Where do lab samples get sent?

- How are lab samples packaged and delivered?
- Where do hospitals send lab samples?

Facilitator Dialogue

How does the health district triage case reports that come in after hours? Who here might receive a case report after hours? *[To identified person]* You are woken at 11:45pm on July 27 and receive the following case report from an emergency department physician at **[local hospital]**:

On June 26, a 55yo Hispanic male presented to **[local health clinic]**

- ✓ He did not speak English and required a translator
- ✓ He reported 3 days of fever, chills, malaise and chest heaviness
- ✓ He had a slight, unproductive cough
- ✓ He has a 20 year pack-a-day smoking history
- ✓ He returned recently from visiting family for 6 wks in Mexico, but denied contact with ill people or ingestion of unusual foods
- ✓ History of positive PPD
- ✓ Chest X-ray showed widened mediastinum and hilar adenopathy, but no discreet cavity
- ✓ He was given a mask and sent for induced sputums
- ✓ Tonight (July 27) he appeared confused and became more tachypneic and daughter noticed an episode of melena. Lumbar puncture revealed bloody CSF with many WBC and occasional gram-positive bacilli.

Facilitator Probes

[To identified person]

- If you received a call like this after hours, what would you do?
- Would you wait until the morning to handle the situation or is it urgent enough to deal with immediately?

[To all participants]

- How would you deal with non-English speaking populations in your investigation?
- How would you reach out to minority communities?
- What would you like to know (if anything) from the family members of cases?
- How would you begin to connect the dots between the cases?

End of Step 1

Step 2

Facilitator Dialogue

The **[local health department]** has decided to convene a meeting with other local *[and possibly state]* actors that might be involved with a response to a potential outbreak to inform them about what has been happening.

[Depending on the local environment and the relationship between the state and local health department, state health department officials may also need to be included in this meeting].

Briefing for other stakeholders
- ✓ Local law enforcement
- ✓ Local elected officials
- ✓ Etc.

Facilitator Probes

[To the person identified as the leader during Step 1]

- You are in charge of this meeting. Outline the major areas you would like to discuss at the meeting.
- Would you still be in charge at this point or would someone else take over?

[To new participants]

- What kinds of questions would you ask the **[local health department]** at this point in time?
- What are your concerns?

[To local health department participants]

- How would all of you coordinate your epidemiologic investigation with the investigation that law enforcement will be conducting?
- What type of patient information are you allowed to give to law enforcement?

[To local law enforcement]

- During a public health emergency, who do you take orders from?
- If you need PPE to use during your investigation, do you have access to some?
- Have law enforcement personnel all been trained in how to put on PPE?

[To local decision makers]

- What role do you see yourselves having in a situation like this?
- How would you keep open lines of communication with the health department?

Facilitator Dialogue

The initial results of **[local health department]** active surveillance are as follows:

[The size of the outbreak in this exercise can be tailored to be most appropriate for the goals of the local health department participating in the exercise]

- ✓ The emergency department at **[major local hospital]** tells you they have seen nearly **[number]** people with respiratory illness in the last 24 hours. **[number]** have been admitted over the last shift, and their ICUs are now full. They are going on diversion.
- ✓ Other local hospitals are experiencing similar challenges. *[Only include if there is more than one local hospital associated with the health department participating in the exercise]*
- ✓ **[Local health center or clinic]** is reporting unusual numbers of cases with flu-like and respiratory illnesses
- ✓ **[Other local health care facility]** reveals that they have seen a few people with flu-like and respiratory illness, which seems a bit odd for June. They have **[number]** people with respiratory failure in the ICU.

Facilitator Probes

[To local health department participants]

- How do you coordinate your efforts with local health care facilities?
- Is it your responsibility to help a hospital with its divert schedules?
- Do you know the divert schedules of the hospital(s) in your region?

[To hospital staff present]

- What expectations do you have (if any) about the assistance you would get from your local health department during an emergency like this one?
- What type of a communication network do you have with the local health department?
- If you needed to acquire more respiratory equipment or other medical supplies, could your local health department help you? If so, whom would you contact for help?
- How do you deal with large numbers of "worried well" people coming to health care facilities? Is there anything the local health department could do to help?

[To local health department participants]

- How would you handle a large number of calls being placed to the health department by worried people?
- How would you manage staff and handle things like staff burnout, staff not coming into work, etc.

Facilitator Dialogue

The press has been hounding the **[local health department]** for a statement for over 24 hours. The local news has been reporting all of the information it can obtain.

- ✓ Representatives from the media surround the health department and request a press briefing
- ✓ Media are going to local hospitals and questioning doctors and nurses who have seen patients with respiratory illnesses
- ✓ Media have been interviewing patients discharged from local hospitals.

The media insists that you hold a press briefing.

Facilitator Probes

- Who is in charge of communicating with the media in an event like this?
- What are the major messages you would like to give to the press and the public?
- How do you manage your press campaign?
- How often do you speak with the press?
- How do you keep your message to the press consistent?
- Does the health department have templates that it can use to create fast messages for the media?
- How do you avoid frightening the public?
- How much information do you give the media?
- What advice do you have for the public?

End of Step 2

End of Exercise B1

B2. Botulism Medium Exercise Template

OVERVIEW

This tabletop exercise is one exercise in a suite of exercises that have been developed to aid health department officials in assessing the ability of their department to effectively respond to a bioterrorism (BT) event. Each exercise in the suite focuses on a different type of bioterrorism event such as a bacterium, toxin, or virus. This exercise focuses on the purposeful spread of a toxin -- botulism -- in a population of people. The exercise will take approximately 4 hours to complete. It is divided into two steps. In the first step participants are presented with an outbreak and must first detect the problem and then begin connecting the dots by developing a case definition and conducting an epidemiologic investigation. In the second step participants must interact with other key actors involved with the response.

OBJECTIVES

Assess the ability of the health department in the areas of:

- *Surveillance and Detection*
  - Use of existing surveillance systems to detect potential outbreaks
  - Initiation of active surveillance
- *Diagnosis and Investigation*
  - Establishing a case definition
  - Clinical and laboratory investigations
  - Epidemiologic investigation
- *System-Wide Coordination*
  - Handoffs to regional or state health department
  - Coordination of efforts with other local and state stakeholders (e.g., elected officials, law enforcement, etc.)
  - Establishment of an Emergency Operations Center
- *Risk Communication*
  - Effectively communicating essential messages to the public
  - Initiation of a public information campaign
  - Coordination of information to media
- *Disease Control*
  - Prophylaxis and vaccination capabilities
  - Isolation and Quarantine
  - Closing of schools, workplaces, hospitals, etc.

Elements required to meet these objectives appear as checklists at the end of the suite of medium exercises.

EXERCISE MANAGEMENT

Two individuals are needed to conduct this exercise:

- A facilitator who conducts the exercise and, as necessary, offers probes to the participants (The purpose of the probes is to keep the discussion moving forward, and to focus the discussion if it moves off track.)

- A note taker to take notes during the exercise.

Participants

Step 1 participants:

- Local health department staff only
  - Health director
  - Communicable disease control director
  - Bioterrorism coordinator
  - Epidemiologist
  - Representative from a public health laboratory
  - Public health nurse(s)
  - Public Information Officer (local health department)

Step 2 participants:
All participants from Step 1, and:

- Local stakeholders
  - Law enforcement
  - EMS personnel
  - Hospital infection control staff
  - Local physicians
  - Minority community leadership
  - Elected officials
  - Emergency Management official

Depending on the local environment and the relationship between the state and local health department, it may be useful to include regional or state health department staff in an exercise. See Chapter 4 for more details.

Materials Needed for the Exercise

- Conference room able to seat 5-10 people
- Computer with MS PowerPoint and projector (optional)
- Marker board, flip board, or chalkboard
- Copies of exercise materials to give to participants
- Refreshments (e.g., coffee, water, etc.)

Sample Agenda

- 8:00am-8:15am Registration/breakfast
- 8:15am-8:30am Introductions and overview
- 8:30am-9:45am Step 1: Initial response
- 9:45am-10:00am Break/light refreshments
- 10:00am-11:45am Step 2: Intermediate response
- 11:45pm-12:15pm Break/lunch
- 12:15pm-1:30pm Step 3: Hot Wash

Step 1

Initial Situation Report
[Customize the exercise template by choosing <u>one</u> of the below three options for the initial situation report. These options are designed to differ in the level of advanced notification that a health department has prior to an outbreak. In option 1 there is no advanced notification and in options 2-3 there is at least some advanced notification.]

<u>Option 1</u> (Outbreak within the jurisdiction) —A localized disease outbreak originating in the health department's jurisdiction.

February **[year]**:
- ✓ There have been floods in **[local area]** due to inclement weather.
- ✓ **[Local health department]** staff have been aiding flood victims
- ✓ **[Local health department's]** telephone line has been busy with a steady stream of calls about flood victims.

If Option 1 is chosen, the facilitator should immediately begin discussing the first case report after the initial situation report

<u>Option 2</u> (Outbreak within the region) —A regional outbreak that occurs first in a region close to but outside of the jurisdiction of the health department.

February **[year]**
[Local health department] officials receive an alert via the Health Alert Network about an outbreak of botulism in nearby **[region]**. The alert cautions health departments in the region to be on the look out for patients with signs and symptoms associated with botulism.

If Option 2 is chosen, the facilitator should allow participants to discuss what (if anything) they would do if they received such an alert. *[Consider using active surveillance probes listed after the first case report]*

<u>Option 3</u> (Distant outbreak) —A statewide outbreak that occurs in a state that is not geographically close to the health department.

February **[year]**
The Associated Press reports that **[distant state]** has a botulism outbreak that has affected **[number]** people. The state health department is still trying to identify the cause of the outbreak however initial evidence points to bioterrorism.

If Option 3 is chosen, the facilitator should allow participants to discuss what (if anything) they would do if they received such information.

Case Reports

Facilitator Dialogue

Who is responsible for receiving case reports today? *[To identified person]* You receive the following case report on March 1 at 9:00am this morning from the medical examiner who is at [local hospital]:

March 1, a 65-year-old white male was brought to the emergency room his morning at 8:15am after complaining of blurred vision and slurred speech. He has a history of a prior MI and atrial fibrillation, and takes warfarin and a beta blocker. He reported generally had been feeling well, and played badminton with his grandchildren at a church picnic the day before.

- ✓ He did not report any chest pain, palpitations, or headache. In the emergency department, he was alert but his speech was slurred.
- ✓ His visual acuity was 20/40 in both eyes, but his eyelids were drooping (ptosis) bilaterally and his pupils were mildly dilated. His gag reflex was diminished. Sensation, motor strength in his arms and legs, and deep tendon reflexes however were intact.
- ✓ While getting an MRI, he aspirated on his secretions, and had a respiratory arrest. He was intubated. MRI was negative for stroke, and he was admitted to the ICU.
- ✓ In the last several hours, he has developed weakness in his upper extremities. Myasthenia was suspected but a Tensilon test is negative.

Facilitator Probes

[To identified person]

- What other information (if any) would you like to have from the caller?
- What advice (if any) would you give the caller?
- Who in the health district would you contact regarding the case? What would you tell them?

[To all participants]

- Who would assume responsibility and take charge at this point?

[The designated official should be encouraged to take charge of the discussion]

- Can you outline the main steps you would take?

[These probes relate to active surveillance. If this was discussed during the initial situation report, move on.]

- At this point would you do anything to try to identify if there are more cases?
- Which entities would you need to contact to initiate active surveillance? What are you going to tell them?
- How would you do active surveillance in vulnerable populations?
- What would you do with potential or suspicious cases that you identified?
- How would you aggregate information on suspicious cases?
- What percentage of physicians in your community could you contact?
- Would your active surveillance include a general public health advisory?

Facilitator Dialogue

Who else here might handle a case report if *[the person responding to the first case report]* is not available? *[To identified person]* You receive the following case report on March 1 at 3:00pm on the same day from the infection control practitioner at **[local hospital]**:

March 1, a 22-year-old **[local university]** student was brought to **[local immediate care center]** at 8:30am complaining of double vision. Her roommate noted that she has slurred speech and her pupils are dilated. She had been at a rowdy party the night before and had returned about 4am.

- ✓ At first her roommate suspected that she was simply hung over, but began to get worried when she noted the dilated pupils and slurred speech that she had been given drugs at the party. The roommate was concerned that her friend had been abused at the party so brought her to **[local immediate care center]**.
- ✓ The patient was difficult to understand, but denied having been raped, and indicated she only had 2 beers. The patient's speech became progressively more slurred during the history, and her speech was unintelligible.
- ✓ On exam she was afebrile with stable vital signs. Heart and lungs were normal, but there were only rare bowel sounds. A quick neurological exam noted bilateral ptosis and 6th nerve palsies. A gag reflex was absent. The patient began to drool and hyperventilate, and was intubated prophylactically. She was then transferred urgently to **[local hospital]** at 10:20am.
- ✓ Blood and urine tox screens were negative. Blood alcohol was less than .05. Over the ensuing few hours the patient developed progressive weakness of her neck and upper extremities. An LP was performed, and was unremarkable. A neurology consultant has been called. The nursing director of the ICU calls the health department because he believes this patient may have had a bizarre drug ingestion.

Facilitator Probes

[To identified person]

- What other information (if any) would you like to have from the caller?
- What advice (if any) would you give the caller?
- How if at all would you know about the first case reported earlier in the day?

[To all participants]

- How would you begin thinking about establishing a case definition?
- When (if at all) is there a meeting of the core local health department team who would respond to this problem? What happens at that meeting? How are activities coordinated among staff?
- When (if at all) would you contact your state health department and what would you tell them?
- What contact (if any) would local health department staff have with patients or their families (e.g., would staff call cases on the phone, conduct medical record reviews or personally visit the cases and possibly collect samples)?
- Who is in charge of dealing with lab samples?

- Where do lab samples get sent?
- How are lab samples packaged and delivered?
- Where do hospitals send lab samples?

Facilitator Dialogue

How does the health department triage case reports that come in after hours? Who here might receive a case report after hours? *[To identified person]* You are woken on March 1 at 11:45pm and receive the following case report from an ED physician at **[local hospital]**:

March 1, a 34 year old Hispanic male who speaks little English calls 911 from **[local high school]** where he works as a janitor, because he is experiencing blurred vision, dry mouth and shortness of breath. He has a history of bipolar disorder and panic attacks. Although his mental illness has been well controlled with lithium, he is alarmed by his symptoms and is worried that he is having a panic attack or becoming manic. He has taken an extra dose of clonazepam, but does not feel any better.

- ✓ He was taken to **[local hospital]**. An EMS staff member on the ambulance noted that he was afebrile, had normal vital signs, but had somewhat slurred speech. He remarked to the ED physician that this is 3rd case of this he has seen that day, and jokingly asks if there's a full moon.
- ✓ In the emergency room the patient appeared frightened, his pupils were dilated bilaterally, and he had bilateral 3rd and 6th and 7th nerve palsies. His shoulder muscles were weak, although the remainder of his upper extremities and lower extremities were normal.
- ✓ Despite his seemingly vehement denials, the ED staff were worried about a drug ingestion given his history of mental illness, and placed an NG tube for charcoal lavage. He vomited, aspirated and was intubated.
- ✓ He was initially agitated, waving his arms for attention, but over last several hours he has become spontaneously less so. He is currently unable to move his arms on command, but is able to move his legs. Strength and sensation are normal in the lower extremities.
- ✓ The ED physician had recently returned from a CME program on bioterrorism, and calls to ask if you've had any similar reports.

Facilitator Probes

[To identified person]

- If you received a call like this after hours, what would you do?
- Would you wait until the morning to handle the situation or is it urgent enough to deal with immediately?

[To all participants]

- How would you deal with non-English speaking populations in your investigation?
- How would you reach out to vulnerable communities?
- What would you like to know (if anything) from the family members of cases?

End of Step 1

Step 2

Facilitator Dialogue

The **[local health department]** has decided to convene a meeting with other local *[and possibly state]* actors that might be involved with a response to a potential outbreak to inform them about what has been happening.

[Depending on the local environment and the relationship between the state and local health department, state health department officials may also need to be included in this meeting].

Briefing for other local stakeholders
- ✓ Local law enforcement
- ✓ Local elected officials
- ✓ Etc.

Facilitator Probes

[To the person identified as the leader during Step 1]

- You are in charge of this meeting. Outline the major areas you would like to discuss at the meeting.
- Would you still be in charge at this point or would someone else take over?

[To new participants]

- What kinds of questions would you ask the **[local health department]** at this point in time?
- What are your concerns?

[To local health department participants]

- How would all of you coordinate your epidemiologic investigation with the investigation that law enforcement will be conducting?
- What type of patient information are you allowed to give to law enforcement?

[To local law enforcement]

- During a public health emergency, who do you take orders from?
- If you need PPE, to use during your investigation do you have access to some?
- Have law enforcement personnel all been trained in how to put on PPE?

[To local decision makers]

- What role do you see yourselves having in a situation like this?
- How would you keep open lines of communication with the health department?

Situation Update

The initial results of **[local health department]** epidemiologic investigation are as follows:
[Customize the size of the outbreak based on the goals and size of the health department participating in the exercise]

Follow up on initial cases
- ✓ The only commonality among the patients was that they had all eaten salad—one had purchased salad greens and vegetables at the local supermarket, and the other two had eaten garden salads at local cafes. Preliminary lab results come back with a positive identification of botulism type-A, a relatively common form of the toxin.
- ✓ Lab results definitively confirm type-A botulism

Additional cases
- ✓ **[Number]** additional patients complaining of weakness, blurred vision, diplopia come to the attention of the health department
- ✓ The additional cases do not share any geographic commonalities, but there does seem to be a pattern of ingesting salad prior to onset of botulism symptoms.
- ✓ CDC push packs are scheduled to arrive within 2 hours.
- ✓ **[Local hospital]** has exhausted all of its available ventilators and staff trained in their use.

Facilitator Probes
[To local health department participants]
- How do you coordinate your efforts with local health care facilities?
- Is it your responsibility to help a hospital with its divert schedules?
- Do you know the divert schedules of the hospital(s) in your region?

[To hospital staff present]
- What expectations do you have (if any) about the assistance you would get from your local health department during an emergency like this one?
- What type of a communication network do you have with the local health department?
- If you needed to acquire more respiratory equipment or other medical supplies could your local health department help you? If so, whom would you contact for help?
- How do you deal with large numbers of "worried well" people coming to health care facilities? Is there anything the local health department could do to help?

[To local health department participants]
- How would you handle a large number of calls being placed to the health department by worried people?
- How would you manage staff and handle things like staff burnout, staff not coming into work, etc.

Facilitator Dialogue

The press has been hounding the **[local health department]** for a statement for over 24 hours. The local news has been reporting all of the information it can obtain.

- ✓ Representatives from the media surround the health department and request a press briefing
- ✓ Media are going to local hospitals and questioning doctors and nurses who have seen patients with respiratory illnesses
- ✓ Media have been interviewing patients discharged from local hospitals.

The media insists that you hold a press briefing.

Facilitator Probes

- Who is in charge of communicating with the media in an event like this?
- What are the major messages you would like to give to the press and the public?
- How do you manage your press campaign?
- How often do you speak with the press?
- How do you keep your message to the press consistent?
- Does the health department have templates that it can use to create fast messages for the media?
- How do you avoid frightening the public?
- How much information do you give the media?
- What advice do you have for the public?

End of Step 2

End of Exercise B2

B3. Plague Medium Exercise Template

OVERVIEW

This tabletop exercise is one exercise in a suite of exercises that have been developed to aid health department officials in assessing the ability of their department to effectively respond to a bioterrorism (BT) event. Each exercise in the suit focuses on a different type of bioterrorism event such as a bacterium, toxin, or virus. This exercise focuses on the purposeful spread of a virus -- plague -- in a population of people. The exercise will take approximately 4 hours to complete. It is divided into two steps. In the first step participants are presented with an outbreak and must first detect the problem and then begin connecting the dots by developing a case definition and conducting an epidemiologic investigation. In the second step participants must interact with other key actors involved with the response.

OBJECTIVES

Assess the ability of the health department in the areas of:

- *Surveillance and Detection*
  - Use of existing surveillance systems to detect potential outbreaks
  - Initiation of active surveillance
- *Diagnosis and Investigation*
  - Establishing a case definition
  - Clinical and laboratory investigations
  - Epidemiologic investigation
- *System-Wide Coordination*
  - Handoffs with regional or state health department
  - Coordination of efforts with other local and state actors (e.g., elected officials, law enforcement, etc.)
  - Establishment of an Emergency Operations Center
- *Risk Communication*
  - Effectively communicating essential messages to the public
  - Initiation of a public information campaign
  - Coordination of information to media
- *Disease Control*
  - Prophylaxis and vaccination capabilities
  - Isolation and Quarantine
  - Closing of schools, workplaces, hospitals, etc.

Elements required to meet these objectives appear as checklists at the end of the suite of medium exercises.

EXERCISE MANAGEMENT

Two individuals are needed to conduct this exercise:

- A facilitator who conducts the exercise and, as necessary, offers probes to the participants. (The purpose of the probes is to keep the discussion moving forward, and to focus the discussion if it moves off track.)

- A note taker to take notes during the exercise.

Participants

Step 1 participants:

- Local health department staff only
  - Health director
  - Communicable disease control director
  - Bioterrorism coordinator
  - Epidemiologist
  - Representative from a public health laboratory
  - Public health nurse(s)
  - Public Information Officer (local health department)

Step 2 participants:
All participants from Step 1, and:

- Local stakeholders
  - Law enforcement
  - EMS personnel
  - Hospital infection control staff
  - Local physicians
  - Minority community leadership
  - Elected officials
  - Emergency Management official

Depending on the local environment and the relationship between the state and local health department, it may be useful to include regional or state health department staff in an exercise. See Chapter 4 for more details.

Materials Needed for the Exercise

- Conference room able to seat 5-10 people
- Computer with MS PowerPoint and projector (optional)
- Marker board, flip board, or chalkboard
- Copies of exercise materials to give to participants
- Refreshments (e.g., coffee, water, etc.)

Sample Agenda

- 8:00am-8:15am Registration/breakfast
- 8:15am-8:30am Introductions and overview
- 8:30am-9:45am Step 1: Initial response
- 9:45am-10:00am Break/light refreshments
- 10:00am-11:45am Step 2: Intermediate response
- 11:45pm-12:15pm Break/lunch
- 12:15pm-1:30pm Step 3: Hot Wash

Step 1

Initial Situation Report
[Customize the exercise template by choosing <u>one</u> of the below three options for the initial situation report. These options are designed to differ in the level of advanced notification that a health department has prior to an outbreak. In option 1 there is no advanced notification and in options 2-3 there is at least some advanced notification.]

<u>Option 1</u> (Outbreak within the jurisdiction) —A localized disease outbreak originating in the health department's jurisdiction.

June **[year]**:
- ✓ **[Local area]** is locked in a continuing heat wave with daytime high temperatures expected to exceed **[number]** degrees Fahrenheit
- ✓ Summer vacation traffic is high and air quality is poor
- ✓ The health department has been receiving a steady stream of calls with reports of dehydration, especially among infants and elderly
- ✓ Some of the elderly patients have developed respiratory distress and two have died
- ✓ Senior centers have begun to distribute fans to centers without air conditioning.

If Option 1 is chosen, the facilitator should immediately begin discussing the first case report after the initial situation report

<u>Option 2</u> (Outbreak within the region) —A regional outbreak that occurs first in a region close to but outside of the jurisdiction of the health department.

June **[year]**
[Local health department] officials receive an alert via the Health Alert Network about an outbreak of plague in nearby **[region]**. The alert cautions health departments in the region to be on the lookout for patients with respiratory illnesses.

If Option 2 is chosen, the facilitator should allow participants to discuss what (if anything) they would do if they received such an alert. *[Consider using active surveillance probes listed after the first case report]*

<u>Option 3</u> (Distant outbreak) —A statewide outbreak that occurs in a state that is not geographically close to the health department.

June **[year]**
The Associated Press reports that **[distant state]** has a plague outbreak that has affected **[number]** people. The state health department is still trying to identify the cause of the outbreak however bioterrorism is strongly suspected.

If Option 3 is chosen, the facilitator should allow participants to discuss what (if anything) they would do if they received such information.

Case Reports

Facilitator Dialogue

Who is responsible for receiving case reports today? *[To identified person]* You receive the following case report on June 26 at 9:00am from an emergency medicine doctor who is at **[local hospital]:**

> June 26, a 10 year-old male child is brought to the **[local emergency room]** with shortness of breath, a cough and blood-tinged sputum. He is accompanied by his mother, who works as a housekeeper in **[local area]**. The mother speaks little English but is also coughing. Both are from Guatemala. They are given masks, and asked to wear them while sputum examinations are pending. The boy is admitted to the hospital after he is found to be febrile and have a cavitary lesion on his chest x-ray. The mother has no health insurance and refuses a chest x-ray. A PPD test was placed on the child. AFB smears are preliminarily negative. You receive a call about a suspicious case of TB in a school-age child.

[Clinical background story: While this case could well be plague, it is most likely TB. However, the shortness of breath, cough and blood-tinged sputum are non-specific enough that you would catch this if doing active surveillance for plague. The suspicion about plague increases once the AFB smears are negative, although that does not definitively rule out TB either.]

Facilitator Probes

[To identified person]

- What other information (if any) would you like to have from the caller?
- What advice (if any) would you give the caller?
- Who in the health district would you contact regarding the case? What would you tell them?

[To all participants]

- Who would assume responsibility and take charge at this point?

[The designated official should be encouraged to take charge of the discussion]

- Can you outline the main steps you would take?
- How would you handle the language barrier?

[These probes relate to active surveillance. If this was discussed during the initial situation report, move on.]

- At this point would you do anything to try to identify if there are more cases?
- Which entities would you need to contact to initiate active surveillance? What are you going to tell them?
- How would you do active surveillance in vulnerable populations?
- What would you do with potential or suspicious cases that you identified?
- How would you aggregate information on suspicious cases?
- What percentage of physicians in your community could you contact?
- Would your active surveillance include a general public health advisory?

Facilitator Dialogue

Who else here might handle a case report if *[the person responding to the first case report]* is not available? *[To identified person]* You receive the following case report on June 26 at 3:00pm on the same day from the infection control practitioner at **[local hospital]**:

June 26, a 72-year-old man with a history of recurrent congestive heart failure (CHF) is admitted to **[hospital]** with a cough and bloody sputum.

- ✓ He has obvious signs of fluid overload and is clinically in heart failure.
- ✓ He has a history of multiple admissions for CHF, often due to running out of medicines at the end of the month.
- ✓ The patient has no fever, and has no recent travel history.
- ✓ You are called only because the ICU physician has been asked by the hospital infection control staff to report any cases of cough and bloody sputum. Sputum gram stain was over de-colorized, but negative.

[Clinical background story: This patient came to attention because he had cough and bloody sputum. You cannot rule out plague, but it is not as likely as simple heart failure.]

Facilitator Probes

[To identified person]

- What other information (if any) would you like to have from the caller?
- What advice (if any) would you give the caller?
- How if at all would you know about the first case reported earlier in the day?

[To all participants]

- How would you begin thinking about establishing a case definition?
- When (if at all) is there a meeting of the core local health department team who would respond to this problem? What happens at that meeting? How are activities coordinated among staff?
- When (if at all) would you contact your state health department and what would you tell them?
- What contact (if any) would local health department staff have with patients or their families (e.g., would staff call cases on the phone, conduct medical record reviews or personally visit the cases and possibly collect samples)?

Facilitator Dialogue

How does the your health department triage case reports that come in after hours? Who here might receive a case report after hours? *[To identified person]* You are woken on June 26 at 11:45pm and receive the following case report from an ED physician at **[local hospital]**:

June 26, a 42-year-old flight attendant reports for work at **[local airport]**. While waiting for his aircraft to arrive, he suddenly feels flushed, and over the next hour feels feverish and slightly confused. By the time he should board his plane, he feels too sick and weak to fly.

- ✓ He is sent to the emergency room at **[local hospital]**, where he is found to be hypotensive, and tachypneic.
- ✓ While still able to talk, he says he is HIV positive, on meds, and that his last viral load was low.
- ✓ He becomes too tachypneic to talk and is intubated.
- ✓ CXR was consistent with ARDS.
- ✓ Sputum gram stain revealed gram-negative bacilli.
- ✓ He is currently in the ICU.
- ✓ You are called because of the infectious disease alert sent to your hospital, but the doctor thinks the patient has an AIDS-associated infection.

[Clinical background story: This patient probably has plague. The HIV may have made him more susceptible or made the clinical progression faster. The gram-negative bacilli are consistent with plague, but this could also be another gram-negative pneumonia. But each of these people are "possible cases" and should be considered contagious until proven otherwise.]

Facilitator Probes

[To identified person]

- If you received a call like this after hours, what would you do?
- Would you wait until the morning to handle the situation or is it urgent enough to deal with immediately?

[To all participants]

- Is there anything that would cause you to link all of these case reports together?
- How would you begin to connect the dots?
- What other information would you need?

End of Step 1
Step 2

Facilitator Dialogue

The **[local health department]** has decided to convene a meeting with other local *[and possibly state]* actors that might be involved with a response to a potential outbreak to inform them about what has been happening.

[Depending on the local environment and the relationship between the state and local health departments, state health department officials may also need to be included in this meeting].

Briefing for other local actors
- ✓ Local law enforcement
- ✓ Local elected officials
- ✓ Etc.

Facilitator Probes

[To the person identified as the leader during Step 1]

- You are in charge of this meeting. Outline the major areas you would like to discuss at the meeting.
- Would you still be in charge at this point or would someone else take over?

[To new participants]

- What kinds of questions would you ask the **[local health department]** at this point in time?
- What are your concerns?

[To local health department participants]

- How would all of you coordinate your epidemiologic investigation with the investigation that law enforcement will be conducting?
- What type of patient information are you allowed to give to law enforcement?

[To local law enforcement]

- During a public health emergency, who do you take orders from?
- If you need PPE to use during your investigation do you have access to some?
- Have law enforcement personnel all been trained in how to put on PPE?

[To local decision makers]

- What role do you see yourselves having in a situation like this?
- How would you keep open lines of communication with the health department?

Facilitator Dialogue

The initial results of **[local health department]** active surveillance are as follows:

[The size of the outbreak in this exercise can be tailored to be most appropriate for the goals and size of the local health department participating in the exercise]

- ✓ The emergency department at **[major local hospital]** tells you they have seen nearly **[number]** people with respiratory illness in the last 24 hours. **[number]** have been admitted over the last shift, and their ICUs are now full. They are going on diversion.
- ✓ Other local hospitals are experiencing similar challenges. *[Only include if there is more than one local hospital associated with the health department participating in the exercise]*
- ✓ **[Local health center or clinic]** is reporting unusual numbers of cases with flu-like and respiratory illnesses
- ✓ **[Other local health care facility]** reveals that they have seen a few people with flu-like and respiratory illness, which seems a bit odd for June. They have **[number]** people with respiratory failure in the ICU.

Facilitator Probes

[To local health department participants]

- How do you coordinate your efforts with local health care facilities?
- Is it your responsibility to help a hospitals with its divert schedules?
- Do you know the divert schedules of the hospital(s) in your region?
- What is your strategy for containing the spread of the disease?
- What is your strategy for reducing fatalities among those infected and exposed?
- Do you tell people experiencing certain symptoms to report only to those hospitals?

[To hospital staff present]

- What expectations do you have (if any) about the assistance you would get from your local health department during an emergency like this one?
- What type of a communication network do you have with the local health department?
- If you needed to acquire more respiratory equipment or other medical supplies could your local health department help you? If so, whom would you contact for help?
- How do you deal with large numbers of "worried well" people coming to health care facilities? Is there anything the local health department could do to help?

[To local health department participants]

- How would you handle a large number of calls being placed to the health department by worried people?
- How would you manage staff and handle things like staff burnout, staff not showing up for work, etc.

Facilitator Dialogue

The press has been hounding the **[local health department]** for a statement for over 24 hours. The local news has been reporting all of the information it can obtain.

- ✓ Representatives from the media surround the health department and request a press briefing
- ✓ Media are going to local hospitals and questioning doctors and nurses who have seen patients with respiratory illnesses
- ✓ Media have been interviewing patients discharged from local hospitals.

The media insists that you hold a press briefing.

Facilitator Probes

- Who is in charge of communicating with the media in an event like this?
- What are the major messages you would like to give to the press and the public?
- How do you manage your press campaign?
- How often do you speak with the press?
- How do you keep your message to the press consistent?
- Does the health department have templates that it can use to create fast messages for the media?
- How do you avoid frightening the public?
- How much information do you give the media?
- What advice do you have for the public?

End of Step 2

End of Exercise B3

B4. Smallpox Medium Exercise Template

OVERVIEW

This tabletop exercise is one exercise in a suite of exercises that have been developed to aid health department officials in assessing the ability of their department to effectively respond to a bioterrorism (BT) event. Each exercise in the suit focuses on a different type of bioterrorism event such as a bacterium, toxin, or virus. This exercise focuses on the purposeful spread of a virus -- smallpox -- in a population of people. The exercise will take approximately 4 hours to complete. It is divided into two steps. In the first step participants are presented with an outbreak and must first detect the problem and then begin connecting the dots by developing a case definition and conducting an epidemiologic investigation. In the second step participants must interact with other key actors involved with the response.

OBJECTIVES

Assess the ability of the health department in the areas of:

- *Surveillance and Detection*
  - Use of existing surveillance systems to detect potential outbreaks
  - Initiation of active surveillance
- *Diagnosis and Investigation*
  - Establishing a case definition
  - Clinical and laboratory investigations
  - Epidemiologic investigation
- *System-Wide Coordination*
  - Handoffs with regional or state health department
  - Coordination of efforts with other local and state actors (e.g., elected officials, law enforcement, etc.)
  - Establishment of an Emergency Operations Center
- *Risk Communication*
  - Effectively communicating essential messages to the public
  - Initiation of a public information campaign
  - Coordination of information to media
- *Disease Control*
  - Prophylaxis and vaccination capabilities
  - Isolation and Quarantine
  - Closing of schools, workplaces, hospitals, etc.

Elements required to meet these objectives appear as checklists at the end of the suite of medium exercises.

EXERCISE MANAGEMENT

Two individuals are needed to conduct this exercise:

- A facilitator who conducts the exercise and, as necessary, offers probes to the participants (The purpose of the probes is to keep the discussion moving forward, and to focus the discussion if it moves off track.)

- A note taker to take notes during the exercise.

Participants

Step 1 participants:

- Local health department staff only
  - Health director
  - Communicable disease control director
  - Bioterrorism coordinator
  - Epidemiologist
  - Representative from a public health laboratory
  - Public health nurse(s)
  - Public Information Officer (local health department)

Step 2 participants:
All participants from Step 1, and:

- Local stakeholders
  - Law enforcement
  - EMS personnel
  - Hospital infection control staff
  - Local physicians
  - Minority community leadership
  - Elected officials
  - Emergency Management official

Depending on the local environment and the relationship between the state and local health department, it may be useful to include regional or state health department staff in an exercise. See Chapter 4 for more details.

Materials Needed for the Exercise

- Conference room able to seat 5-10 people
- Computer with MS PowerPoint and projector (optional)
- Marker board, flip board, or chalkboard
- Copies of exercise materials to give to participants
- Refreshments (e.g., coffee, water, etc.)

Sample Agenda

- 8:00am-8:15am Registration/breakfast
- 8:15am-8:30am Introductions and overview
- 8:30am-9:45am Step 1: Initial response
- 9:45am-10:00am Break/light refreshments
- 10:00am-11:45am Step 2: Intermediate response
- 11:45pm-12:15pm Break/lunch
- 12:15pm-1:30pm Step 3: Hot Wash

Step 1

Initial Situation Report

[Customize the exercise template by choosing <u>one</u> of the below three options for the initial situation report. These options are designed to differ in the level of advanced notification that a health department has prior to an outbreak. In option 1 there is no advanced notification and in options 2-3 there is at least some advanced notification.]

<u>Option 1</u> (Outbreak within the jurisdiction) —A localized disease outbreak originating in the health department's jurisdiction.

February **[year]**:
- ✓ There have been floods in **[local area]** due to inclement weather.
- ✓ **[Local health department]** staff have been aiding flood victims
- ✓ **[Local health department's]** telephone line has been busy with a steady stream of calls about **flood** victims

If Option 1 is chosen, the facilitator should immediately begin discussing the first case report after the initial situation report

<u>Option 2</u> (Outbreak within the region) —A regional outbreak that occurs first in a region close to but outside of the jurisdiction of the health department.

February **[year]**
[Local health department] officials receive an alert via the Health Alert Network about an outbreak of smallpox in nearby **[region]**. The alert cautions health departments in the region to be on the look out for patients with signs and symptoms associated with smallpox.

If Option 2 is chosen the facilitator should allow participants to discuss what (if anything) they would do if they received such an alert. *[Consider using active surveillance probes listed after the first case report]*

<u>Option 3</u> (Distant outbreak) —A statewide outbreak that occurs in a state that is not geographically close to the health department.

February **[year]**
The Associated Press reports that **[distant state]** has a smallpox outbreak that has affected **[number]** people. The state health department is still trying to identify the cause of the outbreak however initial evidence points to bioterrorism.

If Option 3 is chosen, the facilitator should allow participants to discuss what (if anything) they would do if they received such information.

Case Reports

Facilitator Dialogue

Who is responsible for receiving case reports today? *[To identified person]* You receive the following case report at 9:00am this morning (March 1) from the medical examiner who is at **[local hospital]:**

February 26, a 40-year-old Hispanic male who works as a maintenance man at **[local school]** presents to the **[local hospital]** with a fever of 102 and vomiting. He speaks very limited English. He improves with antiemetics and is sent home with a diagnosis of viral syndrome.

- ✓ On February 28, he was brought into **[local hospital]** by ambulance, now with fever, severe headache and rash, and is admitted with a presumptive diagnosis of meningitis.
- ✓ On March 1, he becomes hypotensive and subsequently dies, with cultures/diagnostic tests negative for N. meningitis, bacteria, and herpes. An autopsy is scheduled for March 2. The infection control practitioner calls the health department because of suspected meningitis.

[Clinical background story: This person may well have smallpox. The presentation could mimic meningitis, but when the cultures are negative it should be clear that he had a different problem. He has unrecognized HIV and that's why he gets sick and dies so fast.]

Facilitator Probes

[To identified person]

- What other information (if any) would you like to have from the caller?
- What advice (if any) would you give the caller?
- Who in the health district would you contact regarding the case? What would you tell them?

[To all participants]

- Who would assume responsibility and take charge at this point?
- How would you deal with the language barrier?

[The designated official should be encouraged to take charge of the discussion]

- Can you outline the main steps you would take?

[These probes relate to active surveillance. If this was discussed during the initial situation report, move on.]

- At this point would you do anything to try to identify if there are more cases?
- Which entities would you need to contact to initiate active surveillance? What are you going to tell them?
- How would you do active surveillance in vulnerable populations?
- What would you do with potential or suspicious cases that you identified?
- How would you aggregate information on suspicious cases?
- What percentage of physicians in your community could you contact?
- Would your active surveillance include a general public health advisory?

Facilitator Dialogue

Who else here might handle a case report *if [the person responding to the first case report]* is not available? You receive the following case report at 3:00pm the same day (March 1) from and infectious disease practitioner at **[local hospital]**:

[If the local health department is large enough that it has more than one affiliated hospital, choose a different hospital than the one that is used for the first case report]

On February 28, a 42-year-old Asian businessman is seen at **[local hospital]** with a fever, headache, and backache. He had been on a recent business trip to Asia, and is admitted with a presumptive diagnosis of malaria.

- ✓ On March 1 he has a negative blood smear for malaria, no response to empirical therapy, and is beginning to develop a rash on his face, arms, and legs.
- ✓ Six other patients have appeared at **[local hospital]** within the last 48 hours with fevers and nascent rashes. The nurse practitioner in the hospital outpatient department thinks this may be odd and reports the cases to the infection control practitioner at the hospital. The infection control practitioner calls the **[local health department]** to report the cluster and to ask if the health district knows of anything going around.

[Clinical background story: This person could easily have smallpox, a drug reaction, or some other viral rash. A key will be whether all the lesions are in the same stages of development.]

Facilitator Probes

[To identified person]

- What other information (if any) would you like to have from the caller?
- What advice (if any) would you give the caller?
- How if at all would you know about the first case reported earlier in the day?

[To all participants]

- How would you begin thinking about establishing a case definition?
- When (if at all) is there a meeting of the core local health department team who would respond to this problem? What happens at that meeting? How are activities coordinated among staff?
- When (if at all) would you contact your state health department and what would you tell them?
- What contact (if any) would local health department staff have with patients or their families (e.g., would staff call cases on the phone, conduct medical record reviews or personally visit the cases and possibly collect samples)?
- What type of PPE (if any) should people coming in contact with cases wear?

Facilitator Dialogue

How does your health department triage case reports that come in after hours? Who here might receive a case report after hours? *[To identified person]* You are woken at 2:00am on March 2 and receive the following case report from an ED physician at **[local hospital]**:

February 27, a 21-year-old female student at **[local university]** presents to the Student Health Center with a fever, chills, and headache. She gives a history of a sister with the "flu," and mentions that she has been taking some of her roommate's trimethoprim-sulfa. A nasopharyngeal swab for influenza is performed. She is sent home with instructions to call for results, and with Tylenol for pain and fever.

- ✓ On February 28, the student returns to the **[local university]** student health center with continued fever, and a rash on her face and arms. She is sent to **[local hospital]** and admitted for observation with diagnoses of possible chickenpox versus drug allergy. The influenza test from her previous visit was negative.
- ✓ On March 2, an infectious disease consult is obtained on the student to verify a diagnosis of chickenpox versus drug rash, and to see if any isolation is warranted. The consultant doesn't think that the illness is consistent with varicella; the patient had a prodrome, and all of the lesions on her arms are in the same stage of development. The consultant reviews a dermatology textbook to confirm his clinical recognition, and decides to call the **[local health department]** on the off chance that this represents smallpox.

[Clinical background story: This is likely smallpox. The trimethoprim-sulfa causes a classic drug rash that is easy to distinguish from smallpox. The fact that all of the lesions are in the same stage of development suggests this is not chickenpox.]

Facilitator Probes

[To identified person]

- If you received a call like this after hours, what would you do?

[To all participants]

- Is there anything that would cause you to link all of these case reports together?
- How would you begin to connect the dots?
- What other information would you need?
- How many health department staff are vaccinated for Smallpox?
- Who else would be vaccinated?
- What strategy do you have in place for vaccinating staff?
- Would you also vaccinate staff's family
- How would you begin to vaccinate other first responders including law enforcement?

End of Step 1

Step 2

Facilitator Dialogue

The **[local health department]** has decided to convene a meeting with other local *[and possibly state]* actors that might be involved with a response to a potential outbreak to inform them about what has been happening.

[Depending on the local environment and the relationship between the state and local health department, state health department officials may also need to be included in this meeting].

Briefing for other local stakeholders
- ✓ Local law enforcement
- ✓ Local elected officials
- ✓ Etc.

Facilitator Probes

[To the person identified as the leader during Step 1]

- You are in charge of this meeting. Outline the major areas you would like to discuss at the meeting.
- Would you still be in charge at this point or would someone else take over?

[To new participants]

- What kinds of questions would you ask the **[local health department]** at this point in time?
- What are your concerns?

[To local health department participants]

- How would all of you coordinate your epidemiologic investigation with the investigation that law enforcement will be conducting?
- What type of patient information are you allowed to give to law enforcement?

[To local law enforcement]

- During a public health emergency, from whom do you take orders?
- If you need PPE to use during your investigation, do you have access to some?
- Have law enforcement personnel all been trained in how to put on PPE?

[To local decision makers]

- What role do you see yourselves having in a situation like this?
- How would you keep open lines of communication with the health department?

Situation Update

Facilitator Dialogue
The initial results of **[local health department]** active surveillance are as follows:

[The size of the outbreak in this exercise can be tailored to be most appropriate for the goals and size of the local health department participating in the exercise]

- ✓ The emergency department at **[major local hospital]** tells you they have seen nearly **[number]** people with smallpox-like rashes in the last 24 hours. **[number]** have been admitted over the last shift, and their ICUs are now full. They are going on diversion.
- ✓ Other local hospitals are experiencing similar challenges. *[Only include if there is more than one local hospital associated with the health department participating in the exercise]*

Facilitator Probes
[To local health department participants]

- How do you coordinate your efforts with local health care facilities?
- What do you tell them with regards to the use of isolation and quarantine?
- Is it your responsibility to help hospital with its divert schedule?
- Do you know the divert schedules of the hospital(s) in your region?
- What is your strategy for containing the spread of the disease?
- What is your strategy for reducing fatalities among those infected and exposed?
- Are you trying to establish and track contacts?
- Who should be vaccinated in this critical early period?
- Do you identify smallpox hospitals (i.e., those who will treat smallpox victims)?
- Do you tell people experiencing certain symptoms to report only to those hospitals?
- Do you set up triage facilities outside the entrances to all hospitals to screen patients before they enter smallpox and non-smallpox hospitals?
- Who is in charge of, and how do you handle and manage dead bodies?
- Who is in charge of, and how do you dispose of, bio-hazard wastes?

[To hospital staff present]

- What expectations do you have (if any) about the assistance you would get from your local health department during an emergency like this one?
- What type of a communication network do you have with the local health department?
- If you needed to acquire more respiratory equipment or other medical supplies could your local health department help you? If so, whom would you contact for help?

- How do you deal with large numbers of "worried well" people coming to health care facilities? Is there anything the local health department could do to help?

[To local health department participants]

- How would you handle a large number of calls being placed to the health department by worried people?
- How would you manage staff and handle things like staff burnout, staff not showing up for work, etc.

Facilitator Dialogue

The press has been hounding the **[local health department]** for a statement for over 24 hours. The local news has been reporting all of the information it can obtain.

- ✓ Representatives from the media surround the health department and request a press briefing
- ✓ Media are going to local hospitals and questioning doctors and nurses who have seen patients with respiratory illnesses
- ✓ Media have been interviewing patients discharged from local hospitals

The media insists that you hold a press briefing.

Facilitator Probes

- Who is in charge of communicating with the media in an event like this?
- What are the major messages you would like to give to the press and the public?
- How do you manage your press campaign?
- How often do you speak with the press?
- How do you keep your message to the press consistent?
- Does the health department have templates that it can use to create fast messages for the media?
- How do you avoid frightening the public?
- How much information do you give the media?
- What advice do you have for the public?

End of Step 1

End of Exercise B4

B5. Checklists for Medium Exercises

Preamble

These checklists are designed to be used by both the facilitator to aid in guiding the exercise and to aid in the assessment of exercise performance. The note taker should use the checklists by putting an "X" in a check box if exercise participants covered a checklist topic without being probed. The note taker should put a "/" in the box if the participants covered a checklist topic but only after being probed. The note taker should leave a checkbox empty if participants were probed for a particular checklist item but still never provided a response.

Surveillance and Detection Checklist

Detection

- ☐ Have infrastructure in place to respond to case reports 24/7/365
- ☐ Staff with clinical knowledge are able to respond to case reports

Initiating Active Surveillance

- ☐ Provided concrete details on how to go about initiating active surveillance
- ☐ Would contact a number of different individuals and organizations to assist with active surveillance efforts. Identified what those individuals would be asked to do, and would provide them with working case definition
  - ❑ Epidemiologists
  - ❑ Hospital administrators
  - ❑ Hospital infection control practitioners
  - ❑ Emergency departments (ED physicians, nurses, etc.)
  - ❑ Local physicians (primary care, private practice, etc.)
  - ❑ Law enforcement personnel
  - ❑ EMS
  - ❑ General public
- ☐ All new suspected cases would be followed up and monitored by appropriate health department personnel
- ☐ Discussed the process for tracking potential cases
- ☐ All decisions would be logged in a log book
- ☐ Would collect and aggregate data on cases
  - ❑ Date of onset of illness
  - ❑ Place where case lives

- ❑ Place where case became ill
- ❑ Recent travel
- ❑ Individual characteristics of cases (age, sex, occupation, etc.)
- ❑ Contacts of cases

Diagnosis and Investigation Checklist

Establishing a Case Definition

☐ Discussed clear process for establishing case definition

☐ Identified (have knowledge of) resources such as the state health department and the CDC's websites to aid in developing the case definition

☐ Discussed establishing an initial working case definition
- ❑ Kept broad
- ❑ Uniform
- ❑ Relatively simple
- ❑ Timely

☐ Discussed essential elements that would be used in case definition
- ❑ Time (date of onset)
- ❑ Place
- ❑ Person
- ❑ Symptoms
- ❑ Essential physical signs
- ❑ Laboratory confirmation

☐ Would begin to consider how to divide case definition into categories (laboratory confirmed case, probable cases, suspected cases).

☐ Discussed comparing working case definition with existing case definition for other known diseases

☐ Information on possible cases would come from a variety of sources
- ❑ Health care personnel (physicians, nurses, EMS, etc.)
- ❑ Hospitals
- ❑ Schools
- ❑ Affected individuals
- ❑ Close contacts and family members of affected individuals

☐ Information kept on all cases regardless of whether they are confirmed, probable, possible, or unlikely

☐ Data on cases would be collected and stored in a systematic fashion (ideally stored on a microcomputer, with other backup)

Clinical Investigation

- ☐ Would contact state health department to let them know of suspected cases
- ☐ At least one health department epidemiologist or communicable disease specialist would contact cases
- ☐ Personnel who visit suspected cases would wear PPE
- ☐ Participants know the general signs and symptoms to look for when examining suspected cases of anthrax (botulism, plague, or smallpox)
- ☐ Clinical specimens would be collected from every case. Participants know what to collect, how to store it, etc.
- ☐ Participants were clear about how they would handle suspected cases
- ☐ Addressed how to deal with non-English speaking cases
- ☐ Would focus on trying to find out what all of the cases had in common (identifying common source)

Laboratory Investigation

- ☐ Personnel trained in how to prepare, package, and ship hazardous biological materials would be responsible for sending samples to laboratories
- ☐ Participants know where to send specimens
- ☐ Participants understand the chain of custody for specimens
- ☐ Recipient of specimens would be alerted in advance

Risk Communication Checklist

Communicators

- ☐ Public Information Officer (PIO) and at least one alternative exists

- ☐ Have personnel other than the PIO to aid in communication
  - ❑ Public affairs specialist
  - ❑ Health Communication specialist
  - ❑ Health education specialist
  - ❑ Crisis communications specialist
  - ❑ Other _____

- ☐ Spokespersons/contacts for multiple audiences have been identified
  - ❑ Bilingual spokespersons available
  - ❑ Minority spokespersons available
  - ❑ Speakers for community meetings
  - ❑ Other _____

- ☐ Pre-existing relationships with community-based organizations that represent major minority groups

- ☐ Communications staff receives regular media relations training

- ☐ All communicators function together as part of a public information team

Risk Communication and Health Information Plan

- ☐ Have a formal written risk communication and health information dissemination plan
  - ❑ Plan includes clear lines of authority and division of responsibility
  - ❑ Plan has been tested
  - ❑ Plan for scheduling public information team in emergencies that may take longer periods of time (i.e., relief schedule for 24/7 coverage)

- ☐ Procedures developed to verify and approve of information that is to be released to the media and the public

- ☐ Procedures developed to coordinate public information campaign to ensure that messages are consistent

- ☐ Risk communication and health information plan has been previously discussed with state health department and/or federal emergency management entities

- ☐ Have established procedures for choosing the appropriate type and level of information to be presented to the media and public

- ☐ Identify who needs to approve messages to the media and the public

- ☐ Are able to articulate the clearance process for approving messages to the media and the public

Direct Communication with Media

- ☐ Have plan to triage media requests and inquiries

- ☐ Are prepared to formally communicate with the media
  - ❑ Predetermined locations for press conferences
  - ❑ Equipment and supplies for press conferences available

- ☐ Have the ability to produce media advisories, press releases, fact sheets, etc.

- ☐ Have pre-drafted templates for press releases, etc. during potential public health emergencies (i.e., infectious disease outbreaks, bioterrorist attacks, etc.)

- ☐ Have plan for handling press leaks and rumors

- ☐ Have a list of contacts at major local media outlets (broadcast and print) that can be used to communicate health information
  - ❑ Includes minority media outlets
  - ❑ Includes non-English language media

- ☐ Would consider briefing the press of situation before likely press leaks (i.e., during outbreak investigation before laboratory confirmation of cases)

- ☐ Would communicate regularly with the media

Direct Communication with the Public

- ☐ Existing telephone line for health department has been tested to handle surge capacity

- ☐ Would establish telephone information hotline for public
  - ❑ Described how hotline would function
  - ❑ Identified how it would be staffed
  - ❑ Know how many callers it could accommodate
  - ❑ Other _____

- ☐ Have ability to communicate with non-English speaking populations

- ☐ Would regularly put up-to-date information and communications directly on health department website
- ☐ Would publicly advertise health department contact information
- ☐ Would elicit feedback from the public to see if messages were being interpreted correctly
- ☐ Have plans for direct communications to minority groups

Disease Control Checklist

- ☐ Outlined a strategy for controlling the disease
- ☐ Involved community partners in disease control strategies
- ☐ Reporting active steps for containing the disease
- ☐ Understood state and local laws related to disease control (e.g., the closure of schools and public places, isolation and quarantine, etc.)

APPENDIX C
Long Exercise

C1. Long Exercise..... 88

C2. Step 1..... 91

C3. Step 2..... 96

C4. Step 3..... 98

C5. Checklists for Long Exercise 101

C1. Long Exercise

OVERVIEW

This tabletop exercise is one exercise in a suite of exercises that have been developed to aid health department officials in assessing the ability of their department to effectively respond to a bioterrorism (BT) event. Each exercise in the suite focuses on a different type of bioterrorism event such as a bacterium, toxin, or virus. This exercise focuses on the purposeful spread of a novel virus. The exercise will take approximately 6 hours to complete. The exercise is divided into three steps. In the first step participants are presented with an outbreak of a novel virus of unknown origin. Participants must first detect the problem and then begin connecting the dots by developing a case definition and conducting an epidemiologic investigation. At the end of this phase participants are presented with information that the novel virus is related to a bioterrorist attack. In the second step participants must interact with other key actors involved with the response. In the third step participants are presented with several brief scenarios that require them to detail their response to specific aspects of simulated bioterrorism events. Step 3 is designed to cover issue areas that were not able to be fully addressed in Steps 1 and 2 such as the public health response to a chemical attack and the public health response to a disease that spreads from animals to humans.

OBJECTIVES

Assess the ability of the health department to:

- *Surveillance and Detection*
  - Use of existing surveillance systems to detect potential outbreaks
  - Initiation of active surveillance
- *Diagnosis and Investigation*
  - Establishing a case definition
  - Clinical and laboratory investigations
  - Epidemiologic investigation
- *System-Wide Coordination*
  - Handoffs with regional or state health department
  - Coordination of efforts with other local and state actors (e.g., elected officials, law enforcement, etc.)
  - Establishment of an Emergency Operations Center
- *Risk Communication*
  - Effectively communicating essential messages to the public
  - Initiation of a public information campaign
  - Coordination of information to media
- *Disease Control*
  - Prophylaxis and vaccination capabilities
  - Isolation and Quarantine
  - Closing of schools, workplaces, hospitals, etc.

- *Consequence Management*
    - Treatment of affected individuals
    - Assessing the provision of needed care
    - Surge capacity

Elements required to meet these objectives appear as checklists at the end of the long exercise.

EXERCISE MANAGEMENT

Two individuals are needed to conduct this exercise:

- A facilitator who conducts the exercise and, as necessary, offers probes to the participants; the purpose of the probes is to keep the discussion moving forward, and to focus the discussion if it moves off track.
- A note taker to take notes during the exercise.

Participants

Step 1 participants:

- Local health department staff only
    - Health director
    - Communicable disease control director
    - Bioterrorism coordinator
    - Epidemiologist
    - Representative from a public health laboratory
    - Public health nurse(s)
    - Public Information Officer (local health department)

Step 2 participants:
All participants from Step 1, and:

- Local stakeholders
    - Law enforcement
    - EMS personnel
    - Hospital infection control staff
    - Local physicians
    - Minority community leadership
    - Elected officials
    - Emergency Management official

Depending on the local environment and the relationship between the state and local health department, it may be useful to include regional or state health department staff in an exercise. Please see Chapter 4 for more details.

Materials Needed for the Exercise

- Conference room able to seat 15-20 people
- Computer with MS PowerPoint and projector
- Marker board, flip board, or chalkboard

- Copies of exercise materials to give to participants
- Refreshments (e.g., coffee, water, etc.)

Sample Agenda

- 8:00am-8:15am Registration/breakfast
- 8:15am-8:30am Introductions and overview
- 8:30am-9:45am Step 1: Initial response
- 9:45am-10:00am Break/light refreshments
- 10:00am-11:45am Step 2: Intermediate response
- 11:45pm-12:15pm Break/lunch
- 12:15pm-1:30pm Step 3: Advanced response
- 1:30pm-2:00pm Step 4: Hotwash

C2. Step 1

Initial Situation Report
[Customize the exercise template by choosing <u>one</u> of the below three options for the initial situation report]

<u>Option 1</u> (Outbreak within the jurisdiction) —A localized disease outbreak originating in the health department's jurisdiction.

July **[year]**:
- ✓ **[Local area]** is locked in a continuing heat wave with daytime high temperatures expected to exceed **[number]** degrees Fahrenheit
- ✓ Summer vacation traffic is high and air quality is poor
- ✓ The health department has been receiving a steady stream of calls with reports of dehydration, especially among infants and elderly
- ✓ Some of the elderly patients have developed respiratory distress and two have died
- ✓ Senior centers have begun to distribute fans to centers without air conditioning.

If Option 1 is chosen, the facilitator should immediately begin discussing the first case report after the initial situation report.

<u>Option 2</u> (Outbreak within the region) —A regional outbreak that occurs first in a region close to but outside of the jurisdiction of the health department.

July **[year]**
[Local health department] officials receive an alert via the Health Alert Network about an outbreak of a novel respiratory illness in nearby **[region]**. The alert cautions health departments in the region to be on the look out for patients with respiratory illnesses.

If Option 2 is chosen, the facilitator should allow participants to discuss what (if anything) they would do if they received such an alert. *[Consider using active surveillance probes listed after the first case report]*

<u>Option 3</u> (Distant outbreak) —A statewide outbreak that occurs in a state that is not geographically close to the health department.

July **[year]**
The Associated Press reports that **[distant state]** has an outbreak of a novel respiratory illness that has affected **[number]** people.

If Option 3 is chosen, the facilitator should allow participants to discuss what (if anything) they would do if they received such information.

Facilitator Dialogue

Who is responsible for receiving case reports today? *[To identified person]* You receive the following case report at 10:00am this morning from a pathologist who works at **[local hospital]:**

July 10, a 55yo South Asian man who is an employee at **[local nursing home]** with no known history of disease was admitted two days ago with a persistent cough, hypoxia, and radiographic evidence of diffuse pneumonia.

- ✓ His condition rapidly deteriorated.
- ✓ He was intubated and expired early that morning of acute respiratory distress syndrome (ARDS).
- ✓ Preliminary cultures from mechanical suctioning were positive for Staph. aureus.
- ✓ Post is not complete yet however thus far does not reveal an immediate cause for respiratory failure, and subsequent cultures are negative so far.

Facilitator Probes

[To identified person]

- What other information (if any) would you like to have from the caller?
- What advice (if any) would you give the caller?
- Who in the health district would you contact regarding the case? What would you tell them?

[To all participants]

- Who would assume responsibility and take charge at this point?

[The designated official should be encouraged to take charge of the discussion]

- Can you outline the main steps you would take?

[These probes relate to active surveillance. If this was discussed during the initial situation report, move on.]

- At this point would you do anything to try to identify if there are more cases?
- Which entities would you need to contact to initiate active surveillance? What are you going to tell them?
- How would you do active surveillance in vulnerable populations?
- What would you do with potential or suspicious cases that you identified?
- How would you aggregate information on suspicious cases?
- What percentage of physicians in your community could you contact?
- Would your active surveillance include a general public health advisory?

Facilitator Dialogue

Who else here might handle a case report if *[the person responding to the first case report]* is not available? *[To identified person]* You receive the following case report at 12:00pm on the same day (July 10) from an infectious disease fellow at **[local hospital]** regarding a cluster of patients with similar symptoms:

- ✓ Patient 1 is a 26yo white male who reports that over the past three days he has been feeling very hot with muscle aches and a severe headache with intermittent nausea and vomiting. Last night, he developed a maculopapular rash on his torso and was suffering from respiratory distress.
- ✓ Patient 2 is a 35yo black female who presented to the ER this morning suffering from apparent respiratory distress. She reports vomiting and diarrhea for the past two days and is severely dehydrated. She also reports having a fever and severe headache. Her fever is now 103.
- ✓ Patient 3 is a 20yo white male who presented with severe vomiting. He has difficulty breathing and chest pain. He reports developing a fever and muscle aches sometime over the weekend and he is dehydrated.
- ✓ Preliminary lab and sputum gram stains from the 3 patients are unremarkable.

[Clinical background story: the doctor is calling because disease clusters are reportable to most health departments. The rash for patient 1 is really just a minor drug rash however it was added to keep participants actively discussing how they would establish a case definition]

Facilitator Probes

[To identified person]

- What other information (if any) would you like to have from the caller?
- What advice (if any) would you give the caller?
- How if at all would you know about the first case reported the day before?

[To all participants]

- How would you begin thinking about establishing a case definition?
- When (if at all) is there a meeting of the core local health department team who would respond to this problem? What happens at that meeting? How are activities coordinated among staff?
- When (if at all) would you contact your state health department and what would you tell them?
- What contact (if any) would local health department staff have with patients or their families (e.g., would staff call cases on the phone, conduct medical record reviews or personally visit the cases and possibly collect samples)?
- Who is in charge of dealing with lab samples?
- Where do lab samples get sent?
- How are lab samples packaged and delivered?
- Where do hospitals send lab samples?

Situation Update

Facilitator Dialogue
The next day (July 11) you receive the following update from **[local hospital]** regarding the three disease cluster patients:

- ✓ Patient 1 and 2 expired during the night from acute respiratory distress syndrome (ARDS) following mechanical ventilation.
- ✓ Patient 3 is intubated and in critical condition.
- ✓ Cultures are all negative.

Facilitator Probes

- What happens now?
- Who else gets involved at this point?
- What is your interaction with other agencies?

Facilitator Dialogue
On July 12 in the early morning active surveillance efforts identify:

- ✓ Several residents at **[local nursing home]** have been suffering from low-grade fever, muscle aches, and cough.
- ✓ The number of affected residents has grown from 3 to 8 within the last 2 days, with no patients showing improvement
- ✓ The nurse practitioner on site has seen all of them, and says that physical exams on all have been unremarkable with the exception that 4 have showed signs of fluctuation in mental status. One appears to have a faint drug rash.

[Clinical background story: see if participants try to link the rash that one of these patients has with a rash that on of the patients in the disease cluster had. The rashes are just coincidence.]

Facilitator Probes

- How do you follow up with these cases?
- What would you ask of them or their families?

Facilitator Dialogue
That same day (July 12) in the afternoon, you receive the following information on the patients from **[local nursing home]**:

- ✓ All 8 of the initial symptomatic residents were admitted to **[local hospital]** with severe shortness of breath, nausea, and poor mental status.
- ✓ 2 of the residents have expired
- ✓ 4 of the remaining 6 were intubated
- ✓ 2 are developing progressive respiratory distress. These 2 also have a distinct maculopapular rash on their torsos. Bronchial alveolar cultures and stains are non-diagnostic.

Facilitator Probes

- When would you set up an ICS or EOC?
- Who is in charge once the EOC has been established?

Facilitator Dialogue
You receive the following information:

- ✓ Press
  - ✓ CNN is reporting that there is an outbreak of an unusual respiratory illness in three major cities across the country.
  - ✓ AP reports the FBI has discovered three chem-bio protection suites and laboratory equipment suitable for growing biological agents in a U-HAUL mini-storage facility in New York; there is evidence that this equipment may have been brought to the US from China
  - ✓ Department of Homeland Security raises its threat advisory level from yellow to orange, citing increased bioterror potential
- ✓ Health Alert Network
  - ✓ An unusual febrile respiratory illness outbreak has occurred in 3 states
  - ✓ The origin of the illness is currently unknown, however there is mounting evidence that it is somehow related to bioterrorism
  - ✓ Health departments are encouraged to initiate active surveillance if they have not already for patients with severe respiratory illnesses.

End of Step 1

C3. Step 2

Facilitator Dialogue

The **[local health department]** has decided to convene a meeting with other local *[and possibly state]* actors that might be involved with a response to a potential outbreak to inform them about what has been happening.

[Depending on the local environment and the relationship between the state and local health department, state health department officials may also need to be included in this meeting].

Briefing for other local actors
- ✓ Local law enforcement
- ✓ Local elected officials
- ✓ *[include a list of all actors who will be present]*

Facilitator Probes

[To the person identified as the leader during Step 1]

- You are in charge of this meeting. Outline the major areas you would like to discuss at the meeting.
- Would you still be in charge at this point or would someone else take over?

[To new participants]

- What kinds of questions would you ask the local health department at this point in time?
- What are your concerns?

[To local health department participants]

- How would all of you coordinate your epidemiologic investigation with the investigation that law enforcement will be conducting?
- What type of patient information are you allowed to give to law enforcement?

[To local law enforcement]

- During a public health emergency, who do you take orders from?
- If you need PPE to use during your investigation, do you have access to some?
- Have law enforcement personnel all been trained in how to put on PPE?

[To local decision makers]

- What role do you see yourselves having in a situation like this?
- How would you keep open lines of communication with the health department?

Facilitator Dialogue

The press has been hounding the **[local health department]** for a statement for over 24 hours. The local news has been reporting all of the information it can obtain.

- ✓ Representatives from the media surround the health department and request a press briefing
- ✓ Media are going to local hospitals and questioning doctors and nurses who have seen patients with respiratory illnesses
- ✓ Media have been interviewing patients discharged from local hospitals.

The media insists that you hold a press briefing.

Facilitator Probes

[To all participants]

- Who is in charge of communicating with the media in an event like this?
- What are the major messages you would like to give to the press and the public?
- How do you manage your press campaign?
- How often do you speak with the press?
- How do you keep your message to the press consistent?
- Does the health department have templates that it can use to create fast messages for the media?
- How do you avoid frightening the public?
- How much information do you give the media?
- What advice do you have for the public?

End of Step 2

C4. Step 3

Scenario A: Phosgene Gas Attack

Facilitator Dialogue
I am going to read you a short scenario and afterwards we will focus on specific issues and how you would respond to them.

[The size of the outbreak in this scenario can be tailored to be most appropriate for the goals of the local health department participating in the exercise]

July 14, **[year]**
- ✓ 10:00pm-**[number]** adults, **[number *(should be greater than number for adults)*]** infants/children present to local health care facilities across **[local area]** complaining of coughing, burning in throat, dizziness, nausea, blurred vision
- ✓ Many patients reported attending an outdoor concert at the **[local amphitheater or park]**
- ✓ **[number]** adults and **[number]** infants/children develop pulmonary edema

July 15, **[year]**
- ✓ Concert drew **[number]** and hundreds of patients (most of them concertgoers) arrive at hospitals overnight
- ✓ About a quarter are stable **[number]** small children are critical and on ventilators
- ✓ By 4:00am, it is evident that **[number]** are suffering bronchitis-like symptoms. Many showed improvement upon leaving the concert

July 16, **[year]**
- ✓ Lab tests to identify agent are all negative
- ✓ **[number]** patients (**[number]** adults, **[number]** children) have died of heart failure; **[number]** adults & **[number]** children develop pulmonary edema

Facilitator Probes
Who is in charge if something like this happens?
- How does the health department interact with local hospitals regarding things like respirators for children?
- If more respirators needed to be obtained-could the health department help out?
- How does the health department assist with an environmental investigation?
- What is different about a "gas" attack verses the response to a virus?
- Who is in charge of and how do you handle and manage dead bodies?
- When does law enforcement become involved?
- How would your response to a chemical attack differ from the response you outlined in the earlier "SARS-like" exercise?

Scenario B: Smallpox Attack

Facilitator Dialogue

I am going to read you a short scenario and afterwards we will focus on specific issues and how you would respond to them.

December 25, [year]

- ✓ 2:20am Christmas morning: **[local hospital]** reports HIV+ patient with headache, backache, sore throat, and high fever. Empiric PCP was initiated. Pan-cultures negative for bacterial/fungal infections. Yesterday had sores on tongue, and today developed pustular rash.
- ✓ 10:00am, **[local hospital]** reports 18yo female with vesicular rash on her face, arms, and legs. Developed fever/headache four nights ago and was bed-ridden two days ago. Yesterday, mouth broke out in sores, and today rash spread to extremities
- ✓ 12:00pm 2 patients report to a local emergency department with classic smallpox symptoms
- ✓ 4:00pm **[number]** new patients present to local hospitals with prodrome, 50% of them with rash in mouth/throat. 20% have with raised lesions on arms.
- ✓ 7:00pm news reports suspicion of highly contagious outbreak in progress—**[local health department]** is reportedly the hardest hit.
- ✓ 9:00pm, streets/highways are jammed and public transit is packed. Some are fleeing, some are rushing home after Christmas, others are trying to purchase essential items

Facilitator Probes

Who is in charge in a situation like this?

- How do you vaccinate the public?
- How do you keep vaccine stockpiles safe?
- Who is in charge of law enforcement (especially with regards to dealing with isolation and quarantine enforcement)
- If you needed to quarantine an area, how would you do so?
- What level of force should law enforcement use to enforce a quarantine?
- How would your response to smallpox differ from the response you outlined in the earlier “SARS-like” exercise?

Scenario C: Rift Valley Fever

Facilitator Dialogue

I am going to read you a short scenario and afterwards we will focus on specific issues and how you would respond to them.

Rodent and Pet Population

- ✓ April 10: **[Nearby city or city of health department]** animal control report increased collection of dead rats and strays. Veterinarians notice increase in acute sepsis resulting in fatality among puppies/kittens
- ✓ April 12: ample evidence of citywide infectious outbreak in pet population

Livestock Population [if applicable]

- ✓ April 10: outside the city, farmers notice higher than normal rate of livestock abortions. Seems to be virulent, fatal infectious disease spreading among young animals
- ✓ April 12: a quarter of local adult cattle develop fever and show excessive salivation, anorexia, and weakness; some develop a fetid diarrhea

Among Human Population

- ✓ Slow, unsteady rise in flu-like symptoms with epigastric discomfort and sometimes photophobia
- ✓ Living close to animals appears to be risk factor
- ✓ By April 15, there are **[number]** unusual cases
- ✓ By April 22, **[number]** patients have been admitted
- ✓ 2-4 days after developing fever, 10% are vomiting blood and develop jaundice, petechiae and bloody diarrhea
- ✓ By April 30th, **[number]** human cases have resulted in death from a meningoencephalitis and massive hemorrhaging

Facilitator Probes

Who is in charge in a situation like this?

- How would the health department coordinate its efforts with the agricultural community and agencies like the state department of agriculture?
- Who would be responsible for contacting local veterinarians? How would you contact them?
- Who is in charge of making decisions about destroying livestock or animal populations? Who enforces these decisions?
- How would your response to rift valley fever differ from the response you outlined in the earlier "SARS-like" exercise?

End of Step 3

End of Long Exercise

C5. Checklists for Long Exercise

Preamble

These checklists are designed to be used by both the facilitator to aid in guiding the exercise and to aid in the assessment of exercise performance. The note taker should use the checklists by putting an "X" in a check box if exercise participants covered a checklist topic without being probed. The note taker should put a "/" in the box if the participants covered a checklist topic but only after being probed. The note taker should leave a checkbox empty if participants were probed for a particular checklist item but still never provided a response.

Surveillance and Detection Checklist

Detection

- ☐ Have infrastructure in place to respond to case reports 24/7/365
- ☐ Staff with clinical knowledge are able to respond to case reports

Initiating Active Surveillance

- ☐ Provided concrete details on how to go about initiating active surveillance
- ☐ Would contact a number of different individuals and organizations to assist with active surveillance efforts. Identified what those individuals would be asked to do, and would provide them with working case definition
  - ❑ Epidemiologists
  - ❑ Hospital administrators
  - ❑ Hospital infection control practitioners
  - ❑ Emergency departments (ED physicians, nurses, etc.)
  - ❑ Local physicians (primary care, private practice, etc.)
  - ❑ Law enforcement personnel
  - ❑ EMS
  - ❑ General public
- ☐ All new suspected cases would be followed up and monitored by appropriate health department personnel
- ☐ Discussed the process for tracking potential cases
- ☐ All decisions would be logged in a log book
- ☐ Would collect and aggregate data on cases
  - ❑ Date of onset of illness
  - ❑ Place where case lives

- ❑ Place where case became ill
- ❑ Recent travel
- ❑ Individual characteristics of cases (age, sex, occupation, etc.)
- ❑ Contacts of cases

Diagnosis and Investigation Checklist

Establishing a Case Definition

☐ Discussed clear process for establishing case definition

☐ Identified (have knowledge of) resources such as the state health department and the CDC's websites to aid in developing the case definition

☐ Discussed establishing an initial working case definition
- ❑ Kept broad
- ❑ Uniform
- ❑ Relatively simple
- ❑ Timely

☐ Discussed essential elements that would be used in case definition
- ❑ Time (date of onset)
- ❑ Place
- ❑ Person
- ❑ Symptoms
- ❑ Essential physical signs
- ❑ Laboratory confirmation

☐ Would begin to consider how to divide case definition into categories (laboratory confirmed case, probable cases, suspected cases).

☐ Discussed comparing working case definition with existing case definition for other known diseases

☐ Information on possible cases would come from a variety of sources
- ❑ Health care personnel (physicians, nurses, EMS, etc.)
- ❑ Hospitals
- ❑ Schools
- ❑ Affected individuals
- ❑ Close contacts and family members of affected individuals

☐ Information kept on all cases regardless of whether they are confirmed, probable, possible, or unlikely

☐ Data on cases would be collected and stored in a systematic fashion (ideally stored on a microcomputer, with other backup)

Clinical Investigation

- ☐ Would contact state health department to let them know of suspected cases
- ☐ At least one health department epidemiologist or communicable disease specialist would contact cases
- ☐ Personnel who visit suspected cases would wear PPE
- ☐ Participants know the general signs and symptoms to look for when examining suspected cases of anthrax (botulism, plague, or smallpox)
- ☐ Clinical specimens would be collected from every case. Participants know what to collect, how to store it, etc.
- ☐ Participants were clear about how they would handle suspected cases
- ☐ Addressed how to deal with non-English speaking cases
- ☐ Would focus on trying to find out what all of the cases had in common (identifying common source)

Laboratory Investigation

- ☐ Personnel trained in how to prepare, package, and ship hazardous biological materials would be responsible for sending samples to laboratories
- ☐ Participants know where to send specimens
- ☐ Participants understand the chain of custody for specimens
- ☐ Recipient of specimens would be alerted in advance

Risk Communication Checklist

Communicators

- ☐ Public Information Officer (PIO) and at least one alternative exists

- ☐ Have personnel other than the PIO to aid in communication
  - ❑ Public affairs specialist
  - ❑ Health Communication specialist
  - ❑ Health education specialist
  - ❑ Crisis communications specialist
  - ❑ Other _____

- ☐ Spokespersons/contacts for multiple audiences have been identified
  - ❑ Bilingual spokespersons available
  - ❑ Minority spokespersons available
  - ❑ Speakers for community meetings
  - ❑ Other _____

- ☐ Pre-existing relationships with community-based organizations that represent major minority groups

- ☐ Communications staff receives regular media relations training

- ☐ All communicators function together as part of a public information team

Risk Communication and Health Information Plan

- ☐ Have a formal written risk communication and health information dissemination plan
  - ❑ Plan includes clear lines of authority and division of responsibility
  - ❑ Plan has been tested
  - ❑ Plan for scheduling public information team in emergencies that may take longer periods of time (i.e., relief schedule for 24/7 coverage)

- ☐ Procedures developed to verify and approve of information that is to be released to the media and the public

- ☐ Procedures developed to coordinate public information campaign to ensure that messages are consistent

- ☐ Risk communication and health information plan has been previously discussed with state health department and/or federal emergency management entities

- ☐ Have established procedures for choosing the appropriate type and level of information to be presented to the media and public

- ☐ Identify who needs to approve messages to the media and the public

- ☐ Are able to articulate the clearance process for approving messages to the media and the public

Direct Communication with Media

- ☐ Have plan to triage media requests and inquiries

- ☐ Are prepared to formally communicate with the media
  - ❑ Predetermined locations for press conferences
  - ❑ Equipment and supplies for press conferences available

- ☐ Have the ability to produce media advisories, press releases, fact sheets, etc.

- ☐ Have pre-drafted templates for press releases, etc. during potential public health emergencies (i.e., infectious disease outbreaks, bioterrorist attacks, etc.)

- ☐ Have plan for handling press leaks and rumors

- ☐ Have a list of contacts at major local media outlets (broadcast and print) that can be used to communicate health information
  - ❑ Includes minority media outlets
  - ❑ Includes non-English language media

- ☐ Would consider briefing the press of situation before likely press leaks (i.e., during outbreak investigation before laboratory confirmation of cases)

- ☐ Would communicate regularly with the media

Direct Communication with the Public

- ☐ Existing telephone line for health department has been tested to handle surge capacity

- ☐ Would establish telephone information hotline for public
  - ❑ Described how hotline would function
  - ❑ Identified how it would be staffed
  - ❑ Know how many callers it could accommodate
  - ❑ Other _____

- ☐ Have ability to communicate with non-English speaking populations

- ☐ Would regularly put up-to-date information and communications directly on health department website
- ☐ Would publicly advertise health department contact information
- ☐ Would elicit feedback from the public to see if messages were being interpreted correctly
- ☐ Have plans for direct communications to minority groups

Disease Control Checklist

- ☐ Outlined a strategy for controlling the disease
- ☐ Involved community partners in disease control strategies
- ☐ Reporting active steps for containing the disease
- ☐ Understood state and local laws related to disease control (e.g., the closure of schools and public places, isolation and quarantine, etc.)

Consequence Management Checklist

- ☐ Outlined a strategy for managing the consequences of the disease
- ☐ Discuss strategies to alleviate public fear and anxiety
- ☐ Outlined an approach to return “life to normal” as soon as possible
- ☐ Established an EOC
- ☐ Developed consequent management priorities
- ☐ Consequent management practices discussed were realistic

APPENDIX D
Create-Your-Own Exercise

OVERVIEW

In this section we discuss how to create a completely custom exercise. This exercise can be of any length (short, medium, or long), can deal with a wide number of biological or chemical agents (including those not covered in this manual), and can cover any of the six major issue areas covered in this manual:

- *Surveillance and Detection*
  - Use of existing surveillance systems to detect potential outbreaks
  - Initiation of active surveillance
- *Diagnosis and Investigation*
  - Establishing a case definition
  - Clinical and laboratory investigations
  - Epidemiologic investigation
- *System-Wide Coordination*
  - Handoffs with regional or state health department
  - Coordination of efforts with other local and state actors (e.g., elected officials, law enforcement, etc.)
  - Establishment of an Emergency Operations Center
- *Risk Communication*
  - Effectively communicating essential messages to the public
  - Initiation of a public information campaign
  - Coordination of information to media
- *Disease Control*
  - Prophylaxis and vaccination capabilities
  - Isolation and Quarantine
  - Closing of schools, workplaces, hospitals, etc.
- *Consequence Management*
  - Treatment of affected individuals
  - Assessing the provision of needed care
  - Surge capacity

Creating a custom exercise can be done in three steps:

- Choose and research the agent or agents to be tested
- Decide what issue areas to cover
- Develop exercise

CHOOSING AN AGENT

The first step to creating a custom exercise is to decide the biological or chemical agent or agents that will be included in the exercise. The choice of agent is important because it determines the actors who might be involved in the response as well as aspects of the response that can be tested (e.g., mass prophylaxis can only be tested with agents that have vaccines or antibiotics available, etc.). If one of the agents covered in this manual is chosen, all of this work has already been done. If an agent not covered in this manual is chosen, background research on the disease chosen will need to be conducted.

DECIDING WHAT ISSUE AREAS TO COVER

As noted above, the agent chosen can in some ways restrict the topics within each issue area that can be covered in any exercise. The decision on what issue areas to cover in an exercise depends on the health department being tested and the goals of the exercise. If a health department has a particular weakness or has new staff assigned to particular tasks, the choice of issue area may be an easy one. Otherwise a health department may decide to choose issue areas that logically flow together. For example, a health department may choose to develop an exercise that focuses on surveillance and detection and diagnosis and investigation.

DEVELOP THE EXERCISE

The exercises in this manual have one or more of the following components:

- Initial Situation Report
- Case Reports
- Facilitated Discussion
- Situation Updates
- Hot wash

INITIAL SITUATION REPORT

The goal of the initial situation report is to set up the exercise. In the exercises in this manual there were three different choices of initial situation report:

- Option 1 (outbreak within the jurisdiction) —A localized disease outbreak originating in the health department's jurisdiction. Reflecting the probable real-life ambiguity of this situation, the initial situation report provides general information about the environment prior to the outbreak.
- Option 2 (outbreak within the region) —A regional outbreak that occurs first in a region close to but outside of the jurisdiction of the health department. The initial situation report details reports received by the local health department about the outbreak in the nearby region.
- Option 3 (distant outbreak) —A statewide outbreak that occurs in a state that is not geographically close to the health department (e.g., a state that does not share the same border with the health department's state). The initial situation report details reports received by the local health department about the outbreak in the distant state.

These options allow the initial discussion to move in a variety of ways. An initial situation report similar to the ones presented in this manual can be developed for any chemical or biological agent by simply changing the name of the agent in the template reports provided in any of the exercises.

CASE REPORTS

Case reports take a considerable amount of time and resources to develop. They must be epidemiologically and clinically sound. The case reports in this manual can be used for a customized exercise of one of the diseases covered in this manual. If developing an exercise for a disease not covered in this manual, case reports will likely need to be either developed by a physician or epidemiologist. Alternatively, they could be developed from case reports from an actual outbreak as reported by the CDC and then reviewed by someone with clinical and epidemiological knowledge.

The goal of case reports is to help stimulate discussion and to present participants with puzzles that require them to collectively think together to develop a response strategy. Therefore, if the goal of an exercise, for example, is to test surveillance and detection, it would not make sense to present participants with case reports which were part of an obvious outbreak with the disease defined for them.

The number of case reports is not so important as the content of the reports. Case reports are also best when supported by a clinical background story (e.g., a brief explanation of the cases symptoms, etc.). A discussion of more than 3 case reports is usually not necessary and can bore participants.

FACILITATED DISCUSSION

All of the exercises in this manual are facilitated discussions meaning they are discussions lead by a discussion leader or a facilitator. A customized exercise will need to contain discussion probes for the exercise facilitator. The probes provided in this manual that focus on particular topic areas can be applied to a wide variety of chemical and biological agents. For example, the probes for dealing with the media and the press could be applied to a discussion of the same topics for a different disease outbreak than the ones covered in this manual.

SITUATION UPDATES

The goal of situation updates is to keep the discussion of the exercise moving forward. Situation updates may not be necessary for short exercises; however they are most likely necessary for medium to long exercises. In this manual there were two different types of situation updates: information updates and complication updates.

There were three different information updates:

- Participants are updated about the status of one or more of the case reports they received earlier. The update gives additional information (e.g., laboratory test results, health status of cases, etc.) that can aid in developing the case definition.

- Participants are given initial results from the active surveillance efforts. This update provides information about possible additional cases and the extent of the outbreak (e.g., number of patients in local hospital emergency department matching case definition, etc.).
- Participants receive information from the epidemiologic investigation that provides clues about the origin of the outbreak (e.g., the results of contact tracing, information from sanitarians in the field, etc.).

There were three different complication updates:

- Participants are told about a press leak or inquiry from the media regarding the outbreak, forcing them to consider how they will deal with the media (e.g., need for press releases, need for a consistent message, etc.).
- Participants are told about staffing difficulties in the health department (e.g., staff not showing up for work, staff reporting that they are exhausted from working so much, etc.).
- Participants are told about public anxiety over the outbreak (e.g., problems of crowd control, looting, etc.).

These same types of updates could be applied generically to any number of different disease scenarios.

HOT WASH

The hot wash for all exercises is very similar. It allows participants to receive feedback from the facilitator as well as one another. The goal of the hot wash is to provide participants with a period after the exercise for self-assessment of their performance and to hear from the facilitator an unbiased view of performance.

APPENDIX E
Disease Information

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All disease information was obtained directly from the Centers for Disease Control and Prevention at www.cdc.gov.

E1. Anthrax Information

NOTE: This information summarized directly from the CDC. The source for this material is: http://www.cdc.gov/ncidod/dbmd/diseaseinfo/anthrax_g.htm

What is anthrax?
Anthrax is an acute infectious disease caused by the spore-forming bacterium Bacillus anthracis. Anthrax most commonly occurs in wild and domestic lower vertebrates (cattle, sheep, goats, camels, antelopes, and other herbivores), but it can also occur in humans when they are exposed to infected animals or tissue from infected animals.

How common is naturally occurring anthrax and who can get it?
Anthrax is most common in agricultural regions where it occurs in animals. These include South and Central America, Southern and Eastern Europe, Asia, Africa, the Caribbean, and the Middle East. When anthrax affects humans, it is usually due to an occupational exposure to infected animals or their products. Workers who are exposed to dead animals and animal products from other countries where anthrax is more common may become infected with B. anthracis (industrial anthrax). Anthrax in wild livestock has occurred in the United States.

How is anthrax transmitted?
Anthrax infection can occur in three forms: cutaneous (skin), inhalation, and gastrointestinal. B. anthracis spores can live in the soil for many years, and humans can become infected with anthrax by handling products from infected animals or by inhaling anthrax spores from contaminated animal products. Eating undercooked meat from infected animals can also spread anthrax. It is rare to find infected animals in the United States.

What are the symptoms of anthrax?
Symptoms of disease vary depending on how the disease was contracted, but symptoms usually occur within 7 days.

Cutaneous: Most (about 95%) anthrax infections occur when the bacterium enters a cut or abrasion on the skin, such as when handling contaminated wool, hides, leather or hair products (especially goat hair) of infected animals. Skin infection begins as a raised itchy bump that resembles an insect bite but within 1-2 days develops into a vesicle and then a painless ulcer, usually 1-3 cm in diameter, with a characteristic black necrotic (dying) area in the center. Lymph glands in the adjacent area may swell. About 20% of untreated cases of cutaneous anthrax will result in death. Deaths are rare with appropriate antimicrobial therapy.

Inhalation: Initial symptoms may resemble a common cold. After several days, the symptoms may progress to severe breathing problems and shock. Inhalation anthrax is usually fatal if untreated.

Intestinal: The intestinal disease form of anthrax may follow the consumption of contaminated meat and is characterized by an acute inflammation of the intestinal tract.

Initial signs of nausea, loss of appetite, vomiting, and fever are followed by abdominal pain, vomiting of blood, and severe diarrhea. Intestinal anthrax results in death in 25% to 60% of cases.

Where is anthrax usually found?
Anthrax can be found globally. It is more common in developing countries or countries without veterinary public health programs. Certain regions of the world (South and Central America, Southern and Eastern Europe, Asia, Africa, the Caribbean, and the Middle East) report more anthrax in animals than others.

Can anthrax be spread from person-to-person?
Direct person-to-person spread of anthrax is extremely unlikely to occur. Communicability is not a concern in managing or visiting with patients with inhalational anthrax.

Is there a way to prevent infection?
In countries where anthrax is common and vaccination levels of animal herds are low, humans should avoid contact with livestock and animal products and avoid eating meat that has not been properly slaughtered and cooked. Also, an anthrax vaccine has been licensed for use in humans. The vaccine is reported to be 93% effective in protecting against anthrax. The vaccine can be used up to 4 days after a person has come into contact with anthrax.

What is the anthrax vaccine?
The anthrax vaccine is manufactured and distributed by BioPort, Corporation, Lansing, Michigan. The vaccine is a cell-free filtrate vaccine, which means it contains no dead or live bacteria in the preparation. The final product contains no more than 2.4 mg of aluminum hydroxide as adjuvant. Anthrax vaccines intended for animals should not be used in humans.

Who should be vaccinated against anthrax?
The Advisory Committee on Immunization Practices has recommended anthrax vaccination for the following groups:

- Persons who work directly with the organism in the laboratory
- Persons who work with imported animal hides or furs in areas where standards are insufficient to prevent exposure to anthrax spores.
- Persons who handle potentially infected animal products in high-incidence areas. (Incidence is low in the United States, but veterinarians who travel to work in other countries where incidence is higher should consider being vaccinated.)
- Military personnel deployed to areas with high risk for exposure to the organism (as when it is used as a biological warfare weapon).

The anthrax Vaccine Immunization Program in the U.S. Army Surgeon General's Office can be reached at 1-877-GETVACC (1-877-438-8222). http://www.anthrax.osd.mil

Pregnant women should be vaccinated only if absolutely necessary.

What is the protocol for anthrax vaccination?
The immunization consists of three subcutaneous injections given 2 weeks apart followed by three additional subcutaneous injections given at 6, 12, and 18 months. Annual booster injections of the vaccine are recommended thereafter.

Are there adverse reactions to the anthrax vaccine?
Mild local reactions occur in 30% of recipients and consist of slight tenderness and redness at the injection site. Severe local reactions are infrequent and consist of extensive swelling of the forearm in addition to the local reaction. Systemic reactions occur in less than 0.2% of recipients.

How is anthrax diagnosed?
Anthrax is diagnosed by isolating B. anthracis from the blood, skin lesions, or respiratory secretions or by measuring specific antibodies in the blood of persons with suspected cases.

Is there a treatment for anthrax?
Doctors can prescribe effective antibiotics. To be effective, treatment should be initiated early. If left untreated, the disease can be fatal.

E2. Botulism Information

NOTE: This information summarized directly from the CDC. The source for this material is: http://www.cdc.gov/ncidod/dbmd/diseaseinfo/botulism_g.htm

What is botulism?

Botulism is a rare but serious paralytic illness caused by a nerve toxin that is produced by the bacterium Clostridium botulinum. There are three main kinds of botulism. Food borne botulism is caused by eating foods that contain the botulism toxin. Wound botulism is caused by toxin produced from a wound infected with Clostridium botulinum. Infant botulism is caused by consuming the spores of the botulinum bacteria, which then grow in the intestines and release toxin. All forms of botulism can be fatal and are considered medical emergencies. Food borne botulism can be especially dangerous because many people can be poisoned by eating a contaminated food.

What kind of germ is Clostridium botulinum?

Clostridium botulinum is the name of a group of bacteria commonly found in soil. These rod-shaped organisms grow best in low oxygen conditions. The bacteria form spores that allow them to survive in a dormant state until exposed to conditions that can support their growth. There are seven types of botulism toxin designated by the letters A through G; only types A, B, E and F cause illness in humans.

How common is botulism?

In the United States an average of 110 cases of botulism are reported each year. Of these, approximately 25% are food borne, 72% are infant botulism, and the rest are wound botulism. Outbreaks of food borne botulism involving two or more persons occur most years and usually caused by eating contaminated home-canned foods. The number of cases of food borne and infant botulism has changed little in recent years, but wound botulism has increased because of the use of black-tar heroin, especially in California.

What are the symptoms of botulism?

The classic symptoms of botulism include double vision, blurred vision, drooping eyelids, slurred speech, difficulty swallowing, dry mouth, and muscle weakness. Infants with botulism appear lethargic, feed poorly, are constipated, and have a weak cry and poor muscle tone. These are all symptoms of the muscle paralysis caused by the bacterial toxin. If untreated, these symptoms may progress to cause paralysis of the arms, legs, trunk and respiratory muscles. In food borne botulism, symptoms generally begin 18 to 36 hours after eating a contaminated food, but they can occur as early as 6 hours or as late as 10 days.

How is botulism diagnosed?

Physicians may consider the diagnosis if the patient's history and physical examination suggest botulism. However, these clues are usually not enough to allow a diagnosis of botulism. Other diseases such as Guillain-Barré syndrome, stroke, and myasthenia gravis can appear similar to botulism, and special tests may be needed to exclude these other

conditions. These tests may include a brain scan, spinal fluid examination, nerve conduction test (electromyography, or EMG), and a tensilon test for myasthenia gravis. The most direct way to confirm the diagnosis is to demonstrate the botulinum toxin in the patient's serum or stool by injecting serum or stool into mice and looking for signs of botulism. The bacteria can also be isolated from the stool of persons with food borne and infant botulism. These tests can be performed at some state health department laboratories and at CDC.

How can botulism be treated?

The respiratory failure and paralysis that occur with severe botulism may require a patient to be on a breathing machine (ventilator) for weeks, plus intensive medical and nursing care. After several weeks, the paralysis slowly improves. If diagnosed early, food borne and wound botulism can be treated with an antitoxin which blocks the action of toxin circulating in the blood. This can prevent patients from worsening, but recovery still takes many weeks. Physicians may try to remove contaminated food still in the gut by inducing vomiting or by using enemas. Wounds should be treated, usually surgically, to remove the source of the toxin-producing bacteria. Good supportive care in a hospital is the mainstay of therapy for all forms of botulism. Currently, antitoxin is not routinely given for treatment of infant botulism.

Are there complications from botulism?

Botulism can result in death due to respiratory failure. However, in the past 50 years the proportion of patients with botulism who die has fallen from about 50% to 8%. A patient with severe botulism may require a breathing machine as well as intensive medical and nursing care for several months. Patients who survive an episode of botulism poisoning may have fatigue and shortness of breath for years and long-term therapy may be needed to aid recovery.

How can botulism be prevented?

Botulism can be prevented. Food borne botulism has often been from home-canned foods with low acid content, such as asparagus, green beans, beets and corn. However, outbreaks of botulism from more unusual sources such as chopped garlic in oil, chile peppers, tomatoes, improperly handled baked potatoes wrapped in aluminum foil, and home-canned or fermented fish. Persons who do home canning should follow strict hygienic procedures to reduce contamination of foods. Oils infused with garlic or herbs should be refrigerated. Potatoes which have been baked while wrapped in aluminum foil should be kept hot until served or refrigerated. Because the botulism toxin is destroyed by high temperatures, persons who eat home-canned foods should consider boiling the food for 10 minutes before eating it to ensure safety. Instructions on safe home canning can be obtained from county extension services or from the US Department of Agriculture. Because honey can contain spores of Clostridium botulinum and this has been a source of infection for infants, children less than 12 months old should not be fed honey. Honey is safe for persons 1 year of age and older. Wound botulism can be prevented by promptly seeking medical care for infected wounds and by not using injectable street drugs.

What are public health agencies doing to prevent or control botulism?
Public education about botulism prevention is an ongoing activity. Information about safe canning is widely available for consumers. State health departments and CDC have persons knowledgeable about botulism available to consult with physicians 24 hours a day. If antitoxin is needed to treat a patient, it can be quickly delivered to a physician anywhere in the country. Suspected outbreaks of botulism are quickly investigated, and if they involve a commercial product, the appropriate control measures are coordinated among public health and regulatory agencies. Physicians should report suspected cases of botulism to a state health department.

Clinical Features:
A neuroparalytic illness characterized by symmetric, descending flaccid paralysis of motor and autonomic nerves, always beginning with the cranial nerves. Symptoms include double vision, blurred vision, drooping eyelids, slurred speech, difficulty swallowing, dry mouth, and muscle weakness. If untreated, illness might progress to cause descending paralysis of respiratory muscles, arms and legs. Botulinum antitoxin (supplied by CDC) can prevent progression of illness and shorten symptoms in severe botulism cases if administered early.

Etiologic Agent:
A potent neurotoxin produced from Clostridium botulinum, an anaerobic, spore-forming bacterium.

Incidence:
In 2001, 169 cases of botulism were reported to the CDC. Of these, 33 were food borne, 112 were infant botulism, and 23 were cases of wound botulism.

Sequelae:
Death can result from respiratory failure. About 5% die. Recovery takes months. Those who survive may have fatigue and shortness of breath for years.

Transmission:
Food borne botulism follows ingestion of toxin produced in food by C. botulinum. The most frequent source is home-canned foods, prepared in an unsafe manner. Wound botulism occurs when C. botulinum spores germinate within wounds. Infant botulism occurs when C. botulinum spores germinate and produce toxin in the gastrointestinal tract of infants.

Risk Groups:
All persons. Injection drug users are at increased risk for wound botulism.
Surveillance In collaboration with state health departments, CDC maintains intensive surveillance for botulism in the United States. Every case of food borne botulism is treated as a public health emergency because the responsible food, whether homemade or commercial, might still be available for consumption and could make unsuspecting persons ill.

Trends:
Vehicles of transmission have included homemade salsa, baked potatoes cooked in aluminum foil, cheese sauce, garlic in oil, and traditionally prepared salted or fermented fish in Alaska. Wound botulism related to the use of black-tar heroin has increased, especially in California.

E3. Phosgene Gas Information

NOTE: This information summarized directly from the CDC. The source for this material is: http://www.bt.cdc.gov/agent/phosgene/basics/facts.asp

What is phosgene?
Phosgene is a major industrial chemical used to make plastics and pesticides. At room temperature (70°F), phosgene is a poisonous gas. With cooling and pressure, phosgene gas can be converted into a liquid so that it can be shipped and stored. When liquid phosgene is released, it quickly turns into a gas that stays close to the ground and spreads rapidly. Phosgene gas may appear colorless or as a white to pale yellow cloud. At low concentrations, it has a pleasant odor of newly mown hay or green corn, but its odor may not be noticed by all people exposed. At high concentrations, the odor may be strong and unpleasant. Phosgene itself is nonflammable (not easily ignited and burned), but it can cause flammable substances around it to burn. Phosgene is also known by its military designation, "CG."

Where phosgene is found and how it is used:
Phosgene was used extensively during World War I as a choking (pulmonary) agent. Among the chemicals used in the war, phosgene was responsible for the large majority of deaths. Phosgene is not found naturally in the environment. Phosgene is used in industry to produce many other chemicals such as pesticides. Phosgene can be formed when certain compounds are exposed to heat, such as some types of plastics. Phosgene gas is heavier than air, so it would be more likely found in low-lying areas.

How people are exposed to phosgene:
People's risk for exposure depends on how close they are to the place where the phosgene was released. If phosgene gas is released into the air, people may be exposed through skin contact or eye contact. They may also be exposed by breathing air that contains phosgene. If phosgene liquid is released into water, people may be exposed by touching or drinking water that contains phosgene. If phosgene liquid comes into contact with food, people may be exposed by eating the contaminated food.

Poisoning caused by phosgene depends on the amount of phosgene to which a person is exposed, the route of exposure, and the length of time that a person is exposed. Phosgene gas and liquid are irritants that can damage the skin, eyes, nose, throat, and lungs.

What are the immediate signs and symptoms of phosgene exposure?
During or immediately after exposure to dangerous concentrations of phosgene, the following signs and symptoms may develop:

- Coughing
- Burning sensation in the throat and eyes
- Watery eyes
- Blurred vision
- Difficulty breathing or shortness of breath
- Nausea and vomiting

- Skin contact can result in lesions similar to those from frostbite or burns

Following exposure to high concentrations of phosgene, a person may develop fluid in the lungs (pulmonary edema) within 2 to 6 hours. Exposure to phosgene may cause delayed effects that may not be apparent for up to 48 hours after exposure, even if the person feels better or appears well following removal from exposure. Therefore, people who have been exposed to phosgene should be monitored for 48 hours afterward.

Delayed effects that can appear for up to 48 hours include the following:

- Difficulty breathing
- Coughing up white to pink-tinged fluid (a sign of pulmonary edema)
- Low blood pressure
- Heart failure

Showing these signs or symptoms does not necessarily mean that a person has been exposed to phosgene.

What are the long-term health effects of exposure?

Most people who recover after an exposure to phosgene make a complete recovery. However, chronic bronchitis and emphysema have been reported as a result of phosgene exposure.

How people can protect themselves and what they should do if they are exposed to phosgene:

Leave the area where the phosgene was released and get to fresh air. Quickly moving to an area where fresh air is available is highly effective in reducing the possibility of death from exposure to phosgene. If the phosgene release was outdoors, move away from the area where the phosgene was released. Go to the highest ground possible, because phosgene is heavier than air and will sink to low-lying areas. If the phosgene release was indoors, get out of the building. If you think you may have been exposed, remove your clothing, rapidly wash your entire body with soap and water, and get medical care as quickly as possible.

Removing and disposing of clothing:

Quickly take off clothing that has liquid phosgene on it. Any clothing that has to be pulled over the head should be cut off the body instead of pulled over the head. If possible, seal the clothing in a plastic bag. Then seal the first plastic bag in a second plastic bag. Removing and sealing the clothing in this way will help protect you and other people from any chemicals that might be on your clothes. If you placed your clothes in plastic bags, inform either the local or state health department or emergency personnel upon their arrival. Do not handle the plastic bags. If you are helping other people remove their clothing, try to avoid touching any contaminated areas, and remove the clothing as quickly as possible.

Washing the body:

As quickly as possible, wash your entire body with large amounts of soap and water. Washing with soap and water will help protect people from any chemicals on their bodies.

If your eyes are burning or your vision is blurred, rinse your eyes with plain water for 10 to 15 minutes. If you wear contacts, remove them and place them in the bags with the contaminated clothing. Do not put the contacts back in your eyes. If you wear eyeglasses, wash them with soap and water. You can put the eyeglasses back on after you wash them.

If you have ingested (swallowed) phosgene, do not induce vomiting or drink fluids. Seek medical attention right away. Dial 911 and explain what has happened.

How phosgene exposure is treated:
Treatment for phosgene exposure consists of removing phosgene from the body as soon as possible and providing supportive medical care in a hospital setting. No antidote exists for phosgene. Exposed people should be observed for up to 48 hours, because it may take that long for symptoms to develop or reoccur.

E4. Plague Information

NOTE: This information summarized directly from the CDC. The source for this material is: http://www.bt.cdc.gov/agent/plague/index.asp

What is plague?
Plague is a disease caused by Yersinia pestis (Y. pestis), a bacterium found in rodents and their fleas in many areas around the world.

Is pneumonic plague different from bubonic plague?
Yes. Both are caused by Yersinia pestis, but they are transmitted differently and their symptoms differ. Pneumonic plague can be transmitted from person to person; bubonic plague cannot. Pneumonic plague affects the lungs and is transmitted when a person breathes in Y. pestis particles in the air. Bubonic plague is transmitted through the bite of an infected flea or exposure to infected material through a break in the skin. Symptoms include swollen, tender lymph glands called buboes. Buboes are not present in pneumonic plague. If bubonic plague is not treated, however, the bacteria can spread through the bloodstream and infect the lungs, causing a secondary case of pneumonic plague.

Why are we concerned about pneumonic plague as a bioweapon?
Yersinia pestis used in an aerosol attack could cause cases of the pneumonic form of plague. One to six days after becoming infected with the bacteria, people would develop pneumonic plague. Once people have the disease, the bacteria can spread to others who have close contact with them. Because of the delay between being exposed to the bacteria and becoming sick, people could travel over a large area before becoming contagious and possibly infecting others. Controlling the disease would then be more difficult. A bioweapon carrying Y. pestis is possible because the bacterium occurs in nature and could be isolated and grown in quantity in a laboratory. Even so, manufacturing an effective weapon using Y. pestis would require advanced knowledge and technology.

What are the signs and symptoms of pneumonic plague?
Patients usually have fever, weakness, and rapidly developing pneumonia with shortness of breath, chest pain, cough, and sometimes bloody or watery sputum. Nausea, vomiting, and abdominal pain may also occur. Without early treatment, pneumonic plague usually leads to respiratory failure, shock, and rapid death.

How do people become infected with pneumonic plague?
Pneumonic plague occurs when Yersinia pestis infects the lungs. Transmission can take place if someone breathes in Y. pestis particles, which could happen in an aerosol release during a bioterrorism attack. Pneumonic plague is also transmitted by breathing in Y. pestis suspended in respiratory droplets from a person (or animal) with pneumonic plague. Respiratory droplets are spread most readily by coughing or sneezing. Becoming infected in this way usually requires direct and close (within 6 feet) contact

with the ill person or animal. Pneumonic plague may also occur if a person with bubonic or septicemic plague is untreated and the bacteria spread to the lungs.

Does plague occur naturally?
Yes. The World Health Organization reports 1,000 to 3,000 cases of plague worldwide every year. An average of 5 to 15 cases occur each year in the western United States. These cases are usually scattered and occur in rural to semi-rural areas. Most cases are of the bubonic form of the disease. Naturally occurring pneumonic plague is uncommon, although small outbreaks do occur. Both types of plague are readily controlled by standard public health response measures.

Can a person exposed to pneumonic plague avoid becoming sick?
Yes. People who have had close contact with an infected person can greatly reduce the chance of becoming sick if they begin treatment within 7 days of their exposure. Treatment consists of taking antibiotics for at least 7 days.

How quickly would someone get sick if exposed to plague bacteria through the air?
Someone exposed to Yersinia pestis through the air—either from an intentional aerosol release or from close and direct exposure to someone with plague pneumonia—would become ill within 1 to 6 days.

Can pneumonic plague be treated?
Yes. To prevent a high risk of death, antibiotics should be given within 24 hours of the first symptoms. Several types of antibiotics are effective for curing the disease and for preventing it. Available oral medications are a tetracycline (such as doxycycline) or a fluoroquinolone (such as ciprofloxacin). For injection or intravenous use, streptomycin or gentamicin antibiotics are used. Early in the response to a bioterrorism attack, these drugs would be tested to determine which is most effective against the particular weapon that was used.

Would enough medication be available in the event of a bioterrorism attack involving pneumonic plague?
National and state public health officials have large supplies of drugs needed in the event of a bioterrorism attack. These supplies can be sent anywhere in the United States within 12 hours.

What should someone do if they suspect they or others have been exposed to plague?
Get immediate medical attention. To prevent illness, a person who has been exposed to pneumonic plague must receive antibiotic treatment without delay. If an exposed person becomes ill, antibiotics must be administered within 24 hours of their first symptoms to reduce the risk of death. Notify authorities. Immediately notify local or state health departments so they can begin to investigate and control the problem right away. If bioterrorism is suspected, the health departments will notify the CDC, FBI, and other appropriate authorities.

How can someone reduce the risk of getting pneumonic plague from another person or giving it to someone else?

People having direct and close contact with someone with pneumonic plague should wear tightly fitting disposable surgical masks. Patients with the disease should be isolated and medically supervised for at least the first 48 hours of antibiotic treatment. People who have been exposed to a contagious person can be protected from developing plague by receiving prompt antibiotic treatment.

How is plague diagnosed?

The first step is evaluation by a health worker. If the health worker suspects pneumonic plague, samples of the patient's blood, sputum, or lymph node aspirate are sent to a laboratory for testing. Once the laboratory receives the sample, preliminary results can be ready in less than two hours. Confirmation will take longer, usually 24 to 48 hours.

How long can plague bacteria exist in the environment?

Yersinia pestis is easily destroyed by sunlight and drying. Even so, when released into air, the bacterium will survive for up to one hour, depending on conditions.

Is a vaccine available to prevent pneumonic plague?

Currently, no plague vaccine is available in the United States. Research is in progress, but we are not likely to have vaccines for several years or more.

E5. Rift Valley Fever Information

NOTE: This information summarized directly from the CDC. The source for this material is: http://www.cdc.gov/ncidod/dvrd/spb/mnpages/dispages/rvf.htm

What is Rift Valley Fever?
Rift Valley fever (RVF) is an acute, fever-causing viral disease that affects domestic animals (such as cattle, buffalo, sheep, goats, and camels) and humans. RVF is most commonly associated with mosquito-borne epidemics during years of unusually heavy rainfall.

What causes Rift Valley Fever?
The disease is caused by the RVF virus, a member of the genus Phlebovirus in the family Bunyaviridae. The disease was first reported among livestock by veterinary officers in Kenya in the early 1900s.

Where is the disease found?
RVF is generally found in regions of eastern and southern Africa where sheep and cattle are raised, but the virus also exists in most countries of sub-Saharan Africa and in Madagascar. In September 2000, a RVF outbreak was reported in Saudi Arabia and subsequently Yemen. These cases represent the first Rift Valley fever cases identified outside Africa.

RVF virus primarily affects livestock and can cause disease in a large number of domestic animals (this situation is referred to as an "epizootic"). The presence of an RVF epizootic can lead to an epidemic among humans who are exposed to diseased animals. The most notable epizootic of RVF, which occurred in Kenya in 1950-1951, resulted in the death of an estimated 100,000 sheep. In 1977, the virus was detected in Egypt (probably exported there in infected domestic animals from Sudan) and caused a large outbreak of RVF among animals and humans. The first epidemic of RVF in West Africa was reported in 1987 and was linked to construction of the Senegal River Project. The project caused flooding in the lower Senegal River area and altered interactions between animals and humans resulting in transmission of the RVF virus to humans.

How is RVF virus spread among animals?
RVF is most commonly associated with mosquito-borne epidemics during years of unusually heavy rainfall. An epizootic of RVF is generally observed during years in which unusually heavy rainfall and localized flooding occur. The excessive rainfall allows mosquito eggs, usually of the genus Aedes, to hatch. The mosquito eggs are naturally infected with the RVF virus, and the resulting mosquitoes transfer the virus to the livestock on which they feed. Once the livestock is infected, other species of mosquitoes can become infected from the animals and can spread the disease. In addition, it is possible that the virus can be transmitted by other biting insects.

How do humans get RVF?

Humans can get RVF as a result of bites from mosquitoes and possibly other bloodsucking insects that serve as vectors. Humans can also get the disease if they are exposed to either the blood or other body fluids of infected animals. This exposure can result from the slaughtering or handling of infected animals or by touching contaminated meat during the preparation of food. Infection through aerosol transmission of RVF virus has resulted from contact with laboratory specimens containing the virus. RVF is not known to be spread directly from person to person.

What are the symptoms of RVF?

RVF virus can cause several different disease syndromes. People with RVF typically have either no symptoms or a mild illness associated with fever and liver abnormalities. However, in some patients the illness can progress to hemorrhagic fever (which can lead to shock or hemorrhage), encephalitis (inflammation of the brain, which can lead to headaches, coma, or seizures), or ocular disease (diseases affecting the eye). Patients who become ill usually experience fever, generalized weakness, back pain, dizziness, and extreme weight loss at the onset of the illness. Typically, patients recover within two days to one week after onset of illness.

Are there complications after recovery?

The most common complication associated with RVF is inflammation of the retina (a structure connecting the nerves of the eye to the brain). As a result, approximately 1% - 10% of affected patients may have some permanent vision loss.

Is the disease ever fatal?

Approximately 1% of humans that become infected with RVF die of the disease. Case-fatality proportions are significantly higher for infected animals. The most severe impact is observed in pregnant livestock infected with RVF, which results in abortion of virtually 100% of fetuses.

How is RVF treated?

There is no established course of treatment for patients infected with RVF virus. However, studies in monkeys and other animals have shown promise for ribavirin, an antiviral drug, for future use in humans. Additional studies suggest that interferon, immune modulators, and convalescent-phase plasma may also help in the treatment of patients with RVF.

Who is at risk for the illness?

Studies have shown that sleeping outdoors at night in geographical regions where outbreaks occur could be a risk factor for exposure to mosquito and other insect vectors. Animal herdsmen, abattoir workers, and other individuals who work with animals in RVF-endemic areas (areas where the virus is present) have an increased risk for infection. Persons in high-risk professions, such as veterinarians and slaughterhouse workers, have an increased chance of contracting the virus from an infected animal. International travelers increase their chances of getting the disease when they visit RVF-endemic locations during periods when sporadic cases or epidemics are occurring.

How is RVF prevented?

A person's chances of becoming infected can be reduced by taking measures to decrease contact with mosquitoes and other bloodsucking insects through the use of mosquito repellents and bednets. Avoiding exposure to blood or tissues of animals that may potentially be infected is an important protective measure for persons working with animals in RVF-endemic areas.

What needs to be done to address the threat of RVF?

A number of challenges remain for the control and prevention of RVF. Knowledge regarding how the virus is transmitted among mosquitoes and the role of vertebrates in propagating the virus must be answered to predict and control future outbreaks of RVF. Vaccines for veterinary use are available, but they can cause birth defects and abortions in sheep and induce only low-level protection in cattle. The human live attenuated vaccine, MP-12, has demonstrated promising results in laboratory trials in domestic animals, but more research will be needed before the vaccine can be used in the field. In addition, surveillance (close monitoring for RVF infection in animal and human populations) is essential to learning more about how RVF virus infection is transmitted and to formulate effective measures for reducing the number of infections.

E6. Smallpox Information

NOTE: This information summarized directly from the CDC. The source for this material is: http://www.bt.cdc.gov/agent/smallpox/disease/

What is smallpox?
Smallpox is a serious disease that can kill up to 3 out of 10 people who get it. Smallpox can also cause:

- a severe rash, which can leave scars when healed.
- high fever
- tiredness
- severe headaches and backache
- blindness

What causes smallpox?
Smallpox is caused by a virus called "variola," which spreads from person to person. Usually, face-to-face contact lasting 3 or more hours is needed to spread smallpox from one person to another. Smallpox can also be spread through direct contact with infected body fluids or objects such as bedding or clothing that have smallpox virus on them.

Smallpox killed millions of people over the centuries. Smallpox vaccination was developed in 1796.As a result, the last outbreak of smallpox in the United States was in 1949. The world's last case of naturally occurring smallpox was in 1977. Routine vaccination of the American public against smallpox ended in 1972.

Although smallpox has been eradicated, there is growing concern that terrorists might obtain the smallpox virus and unleash it in a bioterrorist attack.

What are the symptoms of smallpox?
People infected with smallpox develop some symptoms typical of many less serious diseases, such as fever, headache, backache, and general fatigue. However, the telltale sign is the development of a unique skin rash. The rash, which has a unique indentation at its center, covers the entire body. The rash progresses to a raised bump, then to a pus-filled blister that crusts and scabs over before finally falling off about 3 weeks later, leaving behind a pitted scar.

How long would it take for symptoms to appear if a person were to come into contact with smallpox?
After exposure, there's a 7- to 17-day period of time – called the incubation period – during which time an infected person may not show any symptoms. Then, over the next 2 to 4 days, an infected person may become sick with typical cold and flu-like symptoms (this stage of the disease is called the prodromal stage). The classic smallpox rash begins after these initial cold and flu symptoms disappear. So, the earliest outward symptoms of smallpox would appear would be about 9 days after exposure, when the rash develops. A person with smallpox is most contagious to others while the rash is present, but is still

considered contagious until the last smallpox scab falls off. A person is not contagious during the incubation period and only sometimes contagious during the prodromal stage.

How is smallpox spread?
Smallpox is spread from person to person by several means, including:

- Direct, face-to-face and fairly prolonged contact with an infected person – the saliva of the infected person can spread the disease
- Direct contact with the fluid in the blisters in the infected person's skin or other infected bodily fluids
- Direct contact with contaminated objects, such as blankets, towels or clothes touched by an infected person
- Smallpox is rarely spread through the air in settings such as buses, trains, or office buildings.

Is smallpox fatal?
About 30 percent of people who become infected with smallpox die from their illness.

How is smallpox treated?
There are no drugs to treat smallpox once a person contracts the disease, although drugs can be given to relieve some of the cold and flu symptoms of the disease and other illnesses that might develop in addition to the smallpox. Instead, a vaccine is given to prevent people from contracting the disease in the first place.

Currently, only military personnel who might be exposed to smallpox as a biological weapon of warfare and US healthcare workers ("first responders") are being offered the vaccine. However, enough vaccine has been manufactured to inoculate every man, woman and child in the United States should a bioterrorist attack with smallpox occur. If an outbreak of smallpox were to occur, vaccination within 3 days of exposure will completely prevent or significantly modify the severity of disease in most patients. Vaccination within 4 to 7 days after exposure will likely offer some protection against contracting the disease. The vaccine provides protection from smallpox for 3 to 5 years.

How is the vaccine given?
A two-pronged (bifurcated) needle that has been dipped into the vaccine solution is used to prick the skin of the upper arm several times. The pricking is not deep but will cause a sore spot and one or two droplets of blood to form. If the vaccination is successful, red, itchy bumps develop at the vaccination site followed a few days later by a blister and finally a scab that falls off about 3 weeks later.

Is the smallpox vaccine safe?
The smallpox vaccine offers the best protection against contracting the smallpox virus, which can be fatal. The vaccine itself is not without some risks, however. Based on past history of smallpox vaccination, between 14 and 52 people per 1 million vaccinated will experience a potentially life-threatening reaction, with 1 to 2 of these people dying from these reactions. About 1,000 people per 1 million vaccinated will experience serious –

but not life-threatening – reactions. It is important to note that smallpox cannot be contracted from the vaccine.

APPENDIX F
Frequently Asked Questions

Q. Who developed the exercises?

A. The *RAND Corporation* developed and tested these exercises in 2004 under contract from the U.S. Department of Health and Human Services.

Q. How were the exercises developed?

A. The exercises were conceptualized using guidelines developed by the CDC in 2003. They were beta tested at a wide variety of local health departments across the country from April 2004 through October 2004.

Q. Can exercise components be mixed and matched to create a custom exercise?

A. Yes. Appendix D contains a guide for creating a custom exercise using the components from the exercises presented in the manual.

Q. How should exercises be chosen?

A. Exercises should be chosen based on a number of factors, including the issue areas to be covered, the range of participants to be invited to the exercise, the time available, and the health department's previous exercise experience. Chapter 2 provides more detail on exercise planning.

Q. What is the optimal number of participants for an exercise?

A. Generally speaking, 20 participants is the maximum. With a larger group, the discussion becomes difficult to manage and some participants may not have an equal chance to participate in the exercise.

Q. What if some key local level health department employees are unavailable to participate in an exercise?

A. The exercise can still be conducted as long as five to seven local health department employees are available. In some instances, it might even be preferable to test a department when some key staff members are unavailable, to ensure the department is prepared even if one of its leaders is on vacation or becomes ill during an outbreak. In other instances, staff can be asked to role-play for people who are unavailable. The exercise organizer should decide whether the department can accomplish its goals with the people available for the exercise.

Q. If participants skip an important topic, how can the facilitator be sure that they won't return to it later?

A. The facilitator can provide a few probes that, without giving away the topic, will allow the facilitator to assess whether participants have thought about the topic at all. If participants don't respond to these probes adequately, the facilitator can assume that this is an area of response that participants are not familiar with and can provide more detailed probes. Examples of probes are found in the exercises in the appendixes.

Q. How was the time length of each exercise determined?

A. The exercises were tested in seven local health departments to gauge the approximate time length required to complete each exercise.

Q. Can an exercise have two facilitators?

A. Yes. In some instances, having two facilitators can improve the discussion. Beginning facilitators can benefit by having a more experienced facilitator at the exercise to help lead the discussion.

Q. What happens if the exercise ends too early?

A. The exercise lengths are only approximate. In some cases, exercises may end early because all of the topics are covered. In other cases, an exercise may end early because it was not appropriately facilitated. However, this mistake can be immediately corrected: the facilitator can use the extra time to encourage participants to go back and rethink some of the issues that did not receive sufficient attention.

Q. What is the appropriate length of an after-action report?

A. There is no set length for an after-action report. However, the report should be as brief and concise as possible. A typical after-action report is around three pages in length.

Q. Who should have access to the after-action report when it is complete?

A. Ideally, every person who participated in the exercise should be allowed to read the after-action report.

Q. Can an after-action report be misused?

A. Regretfully, yes. When after-action reports are circulated, they should be clearly labeled "Confidential," and treated as secure documents. An after-action report that makes its way into a reporter's hands could result in negative consequences. In addition, terrorists could potentially use after-action reports to identify weaknesses in the public health infrastructure.