Public Health Emergency Response

A Guide for Leaders and Responders

OFFICE OF THE ASSISTANT SECRETARY FOR PUBLIC AFFAIRS
U.S. Department of Health and Human Services
Washington, D.C.
http://www.hhs.gov/emergency
August 2007

(PDF files updated October 2007)

A Message from the Office of the Assistant Secretary for Public Affairs
U.S. Department of Health and Human Services

The U.S. Department of Health and Human Services (HHS) created this guide to provide public officials (e.g., mayors, governors, county executives, emergency managers) and first responders (e.g., police, fire, EMS) with information on the public health response to emergencies.

This publication is also available online at http://www.hhs.gov/emergency. The Office of the Assistant Secretary for Public Affairs at HHS will keep the online version updated with new information on initiatives, new learning, and any evolutions in the organization of public health emergency response. We urge you to refer to the Web version for the latest information.

If you have any questions or comments about the guide itself, please contact the HHS Public Affairs Office at (202) 690-6343.

Please note: *Since this guide was printed, HHS has begun implementing the provisions of the Pandemic and All Hazards Preparedness Act. As a result, there have been some changes to preparedness and response program responsibilities at HHS, and selective edits were made to the guide in October 2007 to reflect these changes. Other content and Web sites were last reviewed as of the final editing of this manual in May 2007.*

ACKNOWLEDGMENTS

HHS wishes to thank the first responders and public officials from all over the United States who participated in interviews about the content and format of this guide. These interviews were an important source of insight into the information this guide should provide.

This guide was produced by the Office of the Assistant Secretary for Public Affairs and the Office of the Assistant Secretary for Preparedness and Response at the U.S. Department of Health and Human Services (HHS) with the support of the American Institutes for Research.

The following agencies, organizations, and individuals provided expert guidance and review for this guide.

FEDERAL GOVERNMENT AGENCIES

U.S. Department of Health and Human Services

- Centers for Disease Control and Prevention
- Food and Drug Administration
- Health Resources and Services Administration
- Substance Abuse and Mental Health Services Administration
- Indian Health Service

U.S. Department of Agriculture

U.S. Department of Homeland Security

U.S. Environmental Protection Agency

NATIONAL ASSOCIATIONS

American Ambulance Association

American Red Cross

Association of State and Territorial Health Officials

International Association of EMTs and Paramedics

International Association of Fire Chiefs

National Association of Counties

National Association of County and City Health Officials

National Association of State EMS Directors

National Conference of State Legislatures

National EMS Management Association

National Governors Association

National Information Officers Association

The United States Conference of Mayors

ADDITIONAL CONTRIBUTORS AND REVIEWERS

American Institutes for Research, Health Program, Washington, DC and Silver Spring, MD

Vincent Covello, Ph.D., Center for Risk Communication, New York, NY

Kansas Highway Patrol

Montgomery County Department of Health and Human Services, Montgomery County, MD

National Public Health Information Coalition, Marietta, GA

Thomas Phelan, Ph.D., Strategic Teaching Associates, Liverpool, NY

Peter Sandman, Ph.D., Risk Communication Consultant, Princeton, NJ

Public Health Emergency Management, Sedgwick County, KS

This guide was adapted for this audience from HHS' "Terrorism and Other Public Health Emergencies: A Reference Guide for Media," which can be accessed online at http://www.hhs.gov/emergency. Many additional agencies and individuals also participated in the creation and review of that guide.

CONTENTS

1. INTRODUCTION

This guide is for people in a state, city, county, or town who come together during times of emergency, make the tough decisions about how to manage the crisis, and put their boots on the ground to save lives and protect the health and safety of area residents.

Since September 11, 2001, literally hundreds of guides and documents have been prepared for elected and appointed officials and first responders about the nature of terrorism and new homeland security-related roles and responsibilities. However, this document is unique because it attempts to bring together the three sectors: leaders, responders, and public health. In addition, this guide shines light specifically on the public health implications of emergencies—mass casualties, widespread illness, debilitating injuries, and intense psychological trauma—present in almost every terrorist-created emergency.

In focusing the document in this way, we attempt to provide insight into what roles, resources, and tools the public health sector can bring to the emergency response table at local, state, and federal levels. Although you may notice that many examples are focused on terrorism-related public health emergencies, the information is relevant to all kinds of public health emergencies, including natural disasters.

No one is more equipped to deal with emergencies than first responders and local, city, and state officials. This is what you do. But some public health emergencies bring unique challenges that do not typically arise in other situations. For example, these emergencies do not always have an obvious beginning and ending point. Unlike a fire or earthquake, a lurking infectious disease can simmer beneath the surface for some time before it is clear that there is an emergency or outbreak. And people may be affected simultaneously in many different parts of the country. Imagine, for a moment, a release of a chemical agent in malls in three cities, or a disease that emerges in your town and is next spotted in a community across the country, and then another, and then another.

Public health emergencies can spread and require all of the critical players to come together to make rapid, informed decisions and take actions that stop or slow the spread and protect the health and well-being of all Americans. Such emergencies take on the characteristics of a marathon rather than a sprint—the response continues over time—and greatly tax the emotional, physical, and mental reserves of all leaders and responders involved.

We all know that working together is not always easy. Every profession comes to the table with its own cultures, systems, and approaches. Because of the post-9/11 “new normal,” we have all been adjusting to doing our jobs differently. In the case of public health, this has meant a greater shift towards emergency preparedness and response than ever before. For example, from September 11, 2001, to September 2005, the U.S. Department of Health and Human Services (HHS) and the U.S. Department of Homeland Security (DHS) spent more than $14 billion on biodefense preparedness activities, including making available $5.5 billion for hospital, local, and state preparedness. Another $1.2 billion was allocated to hospital, local, and state preparedness for 2006.

This guide describes federal public health responses and programs. It does not attempt to address all the critical public health programs and responses at the local and state levels because those

vary greatly across the country. It is essential that you connect with public health officials in your state and community to find out more about your state and local response plans and structures.

This guide is meant to provide background information to help leaders and first responders, like yourself, make informed decisions and make the best use of the resources available to you at the time of crisis, regardless of how your town, city, county, or state is structured. It is not meant to turn its readers into public health technical experts. Nor is it a playbook for how things will unfold or be managed in any jurisdiction, especially because every jurisdiction is organized differently.

In this guide, we have attempted to address some of the more pressing public health issues facing leaders and responders. As we developed this guide, we discussed the needs of leaders and responders with your peers. Based on their feedback about what information was most needed, you will notice that some topics are discussed in more depth than others, and the formats of the sections differ. Sections include in-depth briefings, abbreviated briefings, how-to suggestions, and an attempt to raise issues and provide resources for local groups to explore and develop their own solutions.

To help you quickly scan the guide, each section begins with a list of highlights. We suggest that you use these highlights to decide which sections and topics you want to start with. It is not necessary to read this guide cover to cover or in any particular order. However, if you had to choose just one section to read in full, the overview of the public health system in section 2 is the keystone to this guide.

As this guide goes to press, there are significant issues related to technology, infrastructure, equipment, operational capacities and authorities, and legal authorities that will continue to be worked on at every level of government. This guide will not attempt to characterize or comment upon them, either because it is out of the purview of the U.S. Department of Health and Human Services or because the specific nature of the challenges is local and the decisions will be determined at that level.

This guide was written to be a helpful companion that will help support you at the most trying of times. It is a resource for before, during, and after a crisis. We hope that it will be more than an information resource—that it will be a catalyst for collaboration and understanding among the many sectors that come together to serve our communities at times of great crisis.

2. PUBLIC HEALTH RESPONSE

SECTION HIGHLIGHTS

This section describes the resources and tools within the public health system that you can use to help address emergencies in your area.

- One of the primary ways that public health threats are detected is through surveillance systems that are set up at the local, state, and federal level.
- There are many tests that are available to confirm agents and/or illnesses.
- The nation has an extensive national network for testing illnesses and/or suspected bioterrorism agents.
- The Centers for Disease Control and Prevention (CDC) Health Alert Network (HAN) is a nationwide system designed to get the word out about public health emergencies. Many states also have their own HAN networks.
- CDC's Strategic National Stockpile (SNS) is set up to supply state and local public health agencies anywhere with medical supplies and equipment within 12 hours in the event of a national emergency.
- Vaccines, isolation, and quarantine are some of the tools that can be used during an emergency to help contain public health threats.
- The National Disaster Medical System (NDMS) is a program designed to provide a range of emergency medical services to support local response. It is a federally coordinated system involving collaboration with states and other appropriate public or private organizations.

Thousands of public health professionals work to promote health and prevent disease and disability across the nation in every community every day. Although this guide primarily focuses on the federal public health response to terrorism and other public health emergencies, understanding how public health works at the local and state levels is critical to understanding how a public health response to an emergency event might take place in your community.

This guide does not go into detail about how local and state health departments will function in a public health emergency; although each state has a state health department, the exact services that are offered and how they are administered vary greatly. All public health departments share similar functions and a philosophy about serving the public, but the federal government does not mandate how state and local health departments are structured. In some cases, certain public health-oriented services may even be provided by a department or agency other than the local or state health department (e.g., air and water security could be provided by an environmental department or agency).

HOW PUBLIC HEALTH DEPARTMENTS MAY BE ORGANIZED

- **Centralized** organizational control: Local health departments function directly under the state's authority and are operated by a state health agency or a board of health (e.g., ME, RI, SC).
- **Decentralized** organizational control: Local governments directly operate local health departments with or without a board of health (e.g., CO, ID, IN, MI, NY, NC, OR, WA).
- **Mixed** organizational control: Local health services may be provided by the state health agency, local governmental units, boards of health, or health departments in other jurisdictions (e.g., NH).
- **Shared** organizational control: Local health departments are under the authority of the state health agency as well as the local government and a board of health (e.g., GA, KY, MD).

Source: Association of State and Territorial Health Officials. (2003). Putting the pieces together: An analysis of state response to foodborne illness. http://www.astho.org/pubs/foodsafety_final.pdf.

Many public health officials have become versed in the Incident Command System and have obtained the skills needed to participate in an emergency response structure as described in the National Incident Management System (NIMS) (http://www.fema.gov/emergency/nims/index.shtm) so that they can work more efficiently with the traditional first responder community. In fact, in order to receive U.S. Department of Health and Human Services (HHS) Fiscal Year 2006 funding for public health preparedness, state, territorial, and local entities needed to demonstrate that they were moving towards compliance with NIMS during Fiscal Year 2006. In addition, public health officials have been working on creating communication plans, gathering public health communication resources, and addressing how they can work together and interact with public information officers and spokespersons from other agencies.

The main goal of the remainder of this section is to provide an overview of how federal government public health agencies would function in an emergency and, when applicable, how their actions would relate to those of state and local governments, first responders, and the private medical system. Some of the specific topics covered here include:

- Syndromic surveillance systems
- The role of epidemiology
- Laboratory testing and laboratory safety levels (biosafety levels)
- Information sharing in public health
- Strategic National Stockpile
- Vaccination strategies

- Critical infection control measures
- National Disaster Medical System

For more information on specific biological, chemical, and radiological agents as well as pandemic influenza, see appendices B–E.

IMPORTANT PUBLIC HEALTH QUESTIONS ABOUT YOUR COMMUNITY: TALK TO YOUR PUBLIC HEALTH LEADERS TO ANSWER THESE AND OTHER CRITICAL QUESTIONS.

- What kind of public health structure exists in your state (e.g., centralized, decentralized), and how does this affect emergency response?
- How is disease surveillance conducted and documented at the state and local levels?
- What types of public health laboratories are present in your state and locality, and what are their capabilities? Where should you plan to send samples?
- Do hospitals and public health agencies have coordinated plans in your locality/region?
- Does your state have its own HAN? How does it work, and who controls it?
- What are the local plans for the distribution of SNS supplies if they are needed?
- What are your area's plans for mass vaccination/medicine distribution clinics?
- What are the local plans/authorities for isolation and quarantine?
- Does your locality have a Medical Reserve Corps? How do you mobilize it?
- What are the state/local plans for pandemic influenza?
- What about nongovernmental organizations (e.g., Red Cross) that operate in your community? Are they involved in the local public health planning?

ACRONYM LIST You may find it helpful to refer to the following list of acronyms as you read this section.	
ATSDR	Agency of Toxic Substances and Disease Registry
BSL	Biosafety Level
CDC	Centers for Disease Control and Prevention
DHS	U.S. Department of Homeland Security
Epi-X	Epidemic Intelligence Exchange
FBI	Federal Bureau of Investigation
HAN	Health Alert Network
HHS	U.S. Department of Health and Human Services
LRN	Laboratory Response Network
NDMS	National Disaster Medical System
NEDSS	National Electronic Disease Surveillance System
NIAID	National Institute of Allergy and Infectious Diseases
NIH	National Institutes of Health
RRR	Rapid Response Registry
SNS	Strategic National Stockpile; formerly NPS
WHO	World Health Organization

If you need more information on public health topics, please visit the HHS Web site at http://www.hhs.gov/emergency, the CDC Web site at http://www.bt.cdc.gov, or call 1–800–CDC–INFO.

DETECTING PUBLIC HEALTH THREATS

SURVEILLANCE SYSTEMS

While some types of public health emergencies may be immediately obvious (e.g., bombs), others are more covert and unfold over time without an obvious beginning (e.g., transmitting a disease, like smallpox). These types of covert attacks may be identified by a process called syndromic surveillance, one of many kinds of surveillance systems. This process, performed in the public health and medical communities, involves the routine monitoring and analysis of data on disease patterns and deaths. As a result of an increase in the use of electronic health information programs, health professionals can track and analyze data more easily and more quickly than ever before. The rapid availability of data in some areas increases the probability that public health officials will identify a large-scale terror attack in its early stages.

The data fed into the local systems are often the result of alert health care professionals, such as:

- Epidemiologists
- Doctors, nurses, and others working in health care institutions and clinics
- Veterinarians and animal control personnel
- Medical examiners
- Pharmacists
- Laboratory scientists
- Emergency Medical Services Workers: In some locations, EMS dispatch systems or 911 centers have begun to develop software to capture relevant information.

When health care professionals see atypical diseases, unusual patterns of diseases (e.g., large numbers of cases of a disease not commonly seen in that part of the nation), higherthan normal death rates from a disease, unusual rises or patterns in purchases of drugs, or uncommon test results, they contact local public health officials. These officials will start investigating and may contact state and federal officials as well as law enforcement, depending on the situation.

Reporting at the local health department level is often electronic, but is still done via paper forms in some places. Although data are entered into electronic systems, the transfer of the data is not always seamless or in real time. To address this issue, CDC is in the process of developing the National Electronic Disease Surveillance System (NEDSS) (http://www.cdc.gov/nedss/index.htm). NEDSS will create standards for the collection, management, transmission, analysis, access, and dissemination of data. Several pilot versions of NEDSS have been completed and are being used in some states, but the system is not yet fully operational. Some states have also developed their own Web-based disease reporting systems that are similar to NEDSS. You may want to check with your state or local health department to get more information about systems in place in your state.

CASE: SYNDROMIC SURVEILLANCE UNCOVERS THE FIRST CASES OF WEST NILE VIRUS IN THE WESTERN HEMISPHERE

In August 1999, an infectious disease specialist contacted the New York City Department of Health about two patients with encephalitis in Queens. Preliminary investigations at nearby hospitals identified six additional cases. After talking to the patients' families, it became clear that all of the patients had participated in outdoor activities around their homes in the evenings, such as gardening. Mosquito breeding sites and larvae were also found in their area. Medical professionals believed at first that the disease was St. Louis encephalitis. However, 4 weeks after the outbreak in humans, a virus, later identified as West Nile virus, was isolated from specimens from crows and a flamingo in a nearby zoo and was determined to be the source of the outbreak for both animals and humans. These were the first cases of West Nile virus ever seen in the Western Hemisphere (Nash et al., 2001).

BIOSENSE

BioSense (http://www.syndromic.org/pdf/work3-JL-BioSense.pdf) is a high-tech disease detection program operated by CDC. BioSense monitors and rapidly identifies any possible health emergencies by constantly scanning medical information from hospital emergency rooms and pharmacies. BioSense also scans environmental data from Project BioWatch, which is described in detail in section 5, Environmental Safety and Testing (see p. 45).

BioSense monitors enormous databases to find groups of common symptoms. The system can assess whether there are any sudden increases in the number of visits to emergency rooms or whether there are sharp increases of prescription and over-the-counter medication purchases in any given location. By comparing these increases with the normal number of visits and medication purchases, analysts can determine whether there might be a cluster of symptoms or an unusual pattern of symptoms that could signal a terrorist attack or other unusual public health problem that could be brewing (e.g., SARS). As real-time health data are collected, they are analyzed and provided to state and local health agencies, by jurisdiction, to better identify and assess potential acts of bioterrorism. Eventually, BioSense will expand to include information from ambulance dispatches, clinics, doctors' offices, school-based clinics, and worksites. Although high-tech programs can enhance surveillance, they don't replace the role of clinicians in detecting unusual cases or patterns of disease.

EARLY WARNING INFECTIOUS DISEASE SURVEILLANCE PROJECT

The Early Warning Infectious Disease Surveillance project, funded by the CDC, is specifically designed for states bordering Mexico and Canada (including the Great Lakes states). The funds have been awarded for the development and implementation of a program to provide early detection, identification, and reporting of infectious diseases associated with both potential bioterrorism agents and other major threats to public health. States included in this program are Alaska, Arizona, California, Idaho, Indiana, Illinois, Maine, Michigan, Minnesota, Montana, New Hampshire, New Mexico, New York, North Dakota, Ohio, Pennsylvania, Texas, Vermont, Washington, and Wisconsin (see the section on the Early Warning Infectious Disease Surveillance Project at http://www.borderhealth.org/usmbhc_early_warning_infectious_disease_surveillance_project.php?curr=programs). This project not only includes working with U.S. states, but also involves working with Canadian provinces and Mexican border states.

THE ROLE OF EPIDEMIOLOGY

> "Epidemiology is the study of the patterns, causes, and control of disease in groups of people."
> *http://plan2005.cancer.gov/glossary.html*

Epidemiologists at the local, state, and federal levels conduct investigations of suspected or confirmed disease or injury outbreaks. In some cases, an epidemiologist may even be the person who spots the outbreak by noticing unusual patterns for a disease in routine surveillance data. Once a problem is identified, epidemiologists work with a multidisciplinary team to launch a more comprehensive investigation; this team includes experts in clinical medicine, environmental health, microbiology, behavioral science, and health education.

Part of their investigation is the interviewing of patients. These interviews provide epidemiologists with some of the data needed to map the spread of an outbreak (i.e., where it came from and where it might be going). For example, by talking to patients, epidemiologists may learn that all of the patients attended the same event, which provides clues about how the outbreak started. Interviews may allow the epidemiologists to determine the index case (the first known case), which may be critical to determining the origin of the outbreak. Epidemiologists also use interviews to identify the close contacts of each patient (e.g., family members, office mates, significant others). In the case of a contagious disease, these people must be found and treated or isolated to prevent the spread of the illness. (It is important to note that, although there are protections for patient privacy in these instances, states have different policies in this area.) The epidemiologic process is critical to infection control and one of the key ways that public health agencies determine how best to control outbreaks.

IS IT TERRORISM?

Health professionals will use the same methods to investigate a bioterror event that they would use to investigate any other outbreak. In many cases today, until proven otherwise, officials will consider whether terrorism is the possible cause of an outbreak. In some cases, an attack may be suspected either because there is evidence of a given agent (e.g., anthrax powder) or because of intelligence or claims of responsibility. In less obvious cases, there are also a few characteristics (see box above) that may indicate that an outbreak is intentional, particularly if several of these characteristics are true of the outbreak.

Even though these characteristics may point to bioterrorism, many of them may also be true in new and emerging naturally caused infectious diseases, like SARS or West Nile virus. Outbreaks of avian influenza in Southeast Asia are an example of an unusual but naturally occurring illness (more information on pandemic influenza can be found in appendix E [see p. 145]). Therefore, although the question “Is it bioterrorism?” is likely to be asked in unusual situations, public health officials will be careful not to prematurely assume that bioterrorism is or isn’t the cause of an outbreak.

CHARACTERISTICS OF OUTBREAKS THAT INDICATE POSSIBLE BIOTERRORISM

- A large number of cases appearing at the same time, particularly in a discrete population (e.g., people from the same town, people who attended the same event)
- A large number of cases of a rare disease or one considered a bioterrorism threat (e.g., plague, tularemia)
- More severe cases than typical for a given disease
- An unusual route of exposure
- A disease that is unusual in a given place or is out of season (e.g., a flu-like outbreak in the summer in the United States)
- Multiple simultaneous outbreaks of the same disease or different diseases
- A disease that affects animals as well as humans
- Unusual disease strains or uncommon antibiotic resistance to an organism

"All indications right now are that this [SARS] is a naturally occurring infectious disease, but we're keeping an open mind about terrorism, especially given the time period that we're operating in."

Julie Gerberding, Director of the Centers for Disease Control and Prevention, discussing the investigation of suspected SARS cases in the United States in March 2003

CNN Health. (2003). More SARS cases investigated in U.S.
http://www.cnn.com/2003/HEALTH/03/21/mystery.pneumonia/

RESPONDING TO PUBLIC HEALTH THREATS

WHY DOES IT TAKE SO LONG TO GET LAB RESULTS?

Once a potential attack is identified, the public health response will immediately begin. Law enforcement, the Federal Bureau of Investigation (FBI), and local and state health and emergency officials will typically work together to determine if a suspicious outbreak is related to terrorism. If possible, the FBI will arrange for samples of the agent to be sent to a special laboratory for testing. It is likely that this lab would be a local or state lab that is a part of the national Laboratory Response Network (LRN), which is described in detail later in this section.

Unfortunately, it is difficult to predict how long testing will take, but understanding the factors that are involved will help in managing the public health emergency as well as the public's expectations regarding this issue. Many television programs currently portray this process as one which occurs quickly and offers straightforward results (e.g., the "CSI effect"). However, this may not always be the case. Some of the agents considered to be public health threats are

relatively unknown and may not have specific tests designed to determine whether they are present in the environment or have infected specific individuals.

In addition, while a positive result from an initial screening test may occur more quickly, it does not provide confirmation. Initial field testing (onsite) is considered presumptive, which means that additional tests must be performed to confirm the original test result (Centers for Disease Control and Prevention, 2004a). In most cases, samples will need to be sent to labs with the ability to do the needed testing. HHS, at this time, recommends against the use of hand-held tests by first responders to evaluate and respond to an incident involving unknown substances suspected to be a public health threat. Samples should be evaluated by a lab in the LRN. Depending on what level of lab is needed (e.g., basic versus advanced) and where those labs are located (e.g., locally, near the suspected attack), timing may be affected.

Once samples have been sent to the appropriate laboratory, numerous tests can be used to analyze the samples—each is unique in how comprehensive it is and how long it takes to confirm results. In addition, how much of an agent is present in the sample will also affect the timing. Larger amounts will speed up the process while smaller amounts may take longer. If a specific agent is suspected, tests may also be used that are specific to that agent (if any exist).

Table 2–1 summarizes the factors affecting the timing of laboratory testing, but more detailed information on diagnostic testing for specific biological agents can be found in appendix B (see p. 98).

TABLE 2–1. SUMMARY OF FACTORS AFFECTING THE TIMING OF LABORATORY TESTING

TESTING FACTOR	DESCRIPTION
Identifying the agent	Because actual bioterrorism incidents have been very rare, physicians have limited experience in identifying these agents in the lab or treating affected patients. This may cause a delay in the effort to test for biological agents since the first patients who become sick may be mistakenly diagnosed with other illnesses.
Presumptive versus confirmatory diagnosis	Some tests can quickly give a presumptive diagnosis that an agent is present. In general, this can be done in about a day. However, confirmatory diagnosis, to give more conclusive results, can take 2–3 days.
Lab compatibilities	The overall timeline will be affected by where the needed tests can be done (e.g., local labs, near a suspected attack). Shipping samples to more advanced labs can tack on an extra day or two to the wait time. CDC's Laboratory Response Network helps facilitate this process.
Viral, bacterial, or toxin load	The "load" refers to how much of the agent is present in a patient. If relatively large amounts of an agent are present, cultures designed to grow the bacteria or virus could take as little as a few hours. If smaller amounts of the agent are present, these same culture tests could take up to 2 or 3 days.
The kind of test that is used	Numerous tests are employed to detect the presence of bioterror agents (e.g., blood cultures can take up to 3 days; gram stains can be ready within an hour). However, some of the quicker tests will only give preliminary information, which must be confirmed with more comprehensive tests.

LABORATORY RESPONSE NETWORK

In most cases, local and state laboratories can manage lab testing for localized outbreaks or other local public health emergencies. However, the LRN is a growing network of laboratories around the country that work together in case of an act of terrorism or other major public health emergency and facilitate rapid identification of a bioterrorism agent. The LRN was developed by CDC (http://www.bt.cdc.gov/lrn), the Association of Public Health Laboratories (http://www.aphl.org), and the FBI.

The LRN has two major components: a network of public health laboratories dealing with biological agents and a network of public health laboratories dealing with chemical agents.

Bio-LRN

The Bio-LRN network has about 120 labs in all 50 states that include local, state, and federal public health labs as well as international, veterinary diagnostic, military, and other specialized labs that test environmental samples, animals, and food. It is made up of three levels of labs that handle progressively more complex testing:

Sentinel Labs

- Include private and hospital labs that routinely process patient tests
- May be the first labs to test and/or recognize a suspicious organism
- Conduct tests to "rule out" less harmful organisms
- Refer samples to a reference lab if they cannot rule out the possibility that the sample is a bioterror agent

Reference Labs

- Have specialized equipment and trained personnel
- Perform tests to detect and confirm the presence of a bioterror agent
- Are capable of producing conclusive, confirmatory results
- Include local, state, and federal labs

National Labs

- Include CDC, the U.S. Army Medical Research Institute for Infectious Diseases in Maryland, and the Naval Medical Research Center, also in Maryland
- Perform highly specialized testing to identify specific disease strains and other characteristics of an investigated agent
- Test certain highly infectious agents that require special handling

Chem-LRN

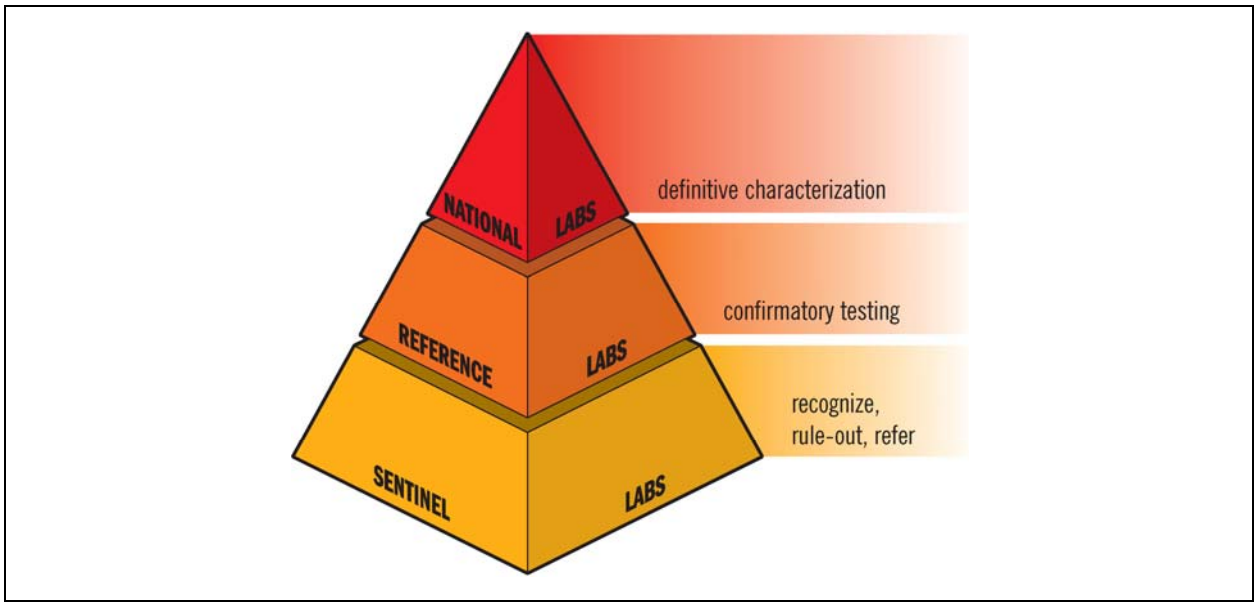
Chem-LRN is a network of 61 laboratories in all states and some territories and municipalities that test for chemical agents in human samples, such as urine or blood. Chem-LRN laboratories have three levels of activities. Each level builds on the preceding level.

- Level 1 (all laboratories): work with hospitals in their jurisdiction and maintain competency in clinical specimen collection, storage, and shipment
- Level 2 (41 laboratories): can detect exposure to a limited number of toxic chemical agents
- Level 3 (five laboratories): can detect exposure to an expanded number of chemicals, including those analyzed by Level 2 laboratories; mustard agents; nerve agents; and ricin

Responding to an Event

- At the request of state officials, CDC may deploy a Rapid Response Team to the affected state to assist with specimen collection, packaging, storage, and shipment.
- Representative samples from people who are suspected to be exposed are sent to CDC for analysis through the Rapid Toxic Screen, which can analyze people's blood or urine for a large number of chemical agents likely to be used by terrorists.
- Data produced from the Rapid Toxic Screen and the health implications associated with those exposures will be communicated in a secure, electronic manner to the affected state.
- Hospitals and laboratories may be dealing with many people concerned about exposure. There will be a need to respond to these concerns and determine whether an individual has been exposed and at what level. CDC will contact the appropriate LRN labs to help participate in the response.

FIGURE 2–1: THE BIO-LABORATORY RESPONSE NETWORK



Source: Association of Public Health Laboratories. (2003). State public health laboratory bioterrorism capacity. Public health laboratory issues in brief: Bioterrorism capacity, 1–6. https://www.aphl.org/programs/emergency_preparedness/files/BT_Brief_2003--corrected.pdf.

BIOSAFETY LEVEL CLASSIFICATIONS

All labs in the United States are rated according to a biosafety level (BSL) classification system. Levels range from 1 to 4. BSLs are used to determine the types of agents scientists can work with in their labs. Scientists use a combination of critical principles, practices, and safety devices to work with infectious materials safely and effectively. BSL classifications are designed not only to protect researchers and technicians from laboratory-acquired infection but also to prevent microorganisms from entering the environment. Many microorganisms may be studied at more than one level, depending on what kinds of activities are involved.

The four BSLs define proper laboratory techniques, safety equipment, and design, as described below:

- **BSL-1** labs are used to study agents not known to consistently cause disease in healthy adults (e.g., E. coli). Researchers follow basic safety procedures and require no special equipment or design features.
- **BSL-2** labs are used to study agents that pose a danger if accidentally inhaled, swallowed, or exposed to the skin (e.g., plague). Diseases related to these agents can be treated through available antibiotics or prevented through immunization. Safety measures include the use of protective gear such as gloves, eyewear, and lab coats as well as hand-washing sinks, methods of waste decontamination, and waste decontamination and safety equipment.
- **BSL-3** labs are used to study agents that can be transmitted through the air and cause potentially lethal infection (e.g., West Nile virus). Researchers perform lab manipulations in

gas-tight enclosures. Other safety features include personal protective equipment, clothing decontamination, sealed windows, and specialized ventilation systems.

- **BSL-4** labs are used to study agents that pose a high risk of life-threatening disease for which no vaccine or therapy is available (e.g., Ebola). Lab personnel are required to wear full-body, air-supplied suits and shower when exiting the facility. The labs incorporate all BSL-2 and BSL-3 features. In addition, BSL-4 laboratories are negative-pressure rooms that are completely sealed and isolated to prevent release of viable agents into the environment (National Institute of Allergy and Infectious Diseases, 2004; Richmond, 2000).

All labs participating in the Bio-LRN are BSL-3 or BSL-4 labs.

SELECT AGENT PROGRAM

As a safeguard against the accidental or intentional exposure of dangerous agents outside of laboratories, CDC developed the Select Agent Program in 1996 to control the possession, packaging, labeling, and transport of certain agents that are capable of causing substantial harm to human health and safety. The program requires that facilities that work with such agents—including government agencies, universities, research institutions, and commercial entities—register with CDC. In addition to tracking and safeguarding the use of these agents, the Select Agent Program established systems for alerting authorities if unauthorized attempts are made to acquire these agents by terrorists or others. These requirements are outlined in the Select Agent Regulation, which was added to the Public Health Service Act (section 351A) by the Public Health Security and Bioterrorism Preparedness and Response Act of 2002. The regulation includes a list of dozens of agents to which it applies, including viral hemorrhagic fevers (like Ebola), smallpox, plague, ricin, anthrax, and avian flu. More detailed information on the Select Agent Program and the Select Agent Regulation can be obtained on the program's Web site (http://www.cdc.gov/od/sap/index.htm).

Please note that people who work with these agents need to apply for a security risk assessment from the U.S. Department of Justice.

THE RELATIONSHIPS BETWEEN HOSPITALS AND PUBLIC HEALTH

Almost all hospitals, with the exception of the U.S. Department of Veterans Affairs, U.S. Department of Defense (DOD), and Indian Health Service hospitals, are not directly supervised by the federal government. However, to strengthen local response, in 2002, HHS' Health Resources and Services Administration (HRSA) started the National Bioterrorism Hospital Preparedness Program. The program was designed to improve hospital capabilities and surge capacity (the ability of a hospital to handle a large influx of patients at one time, often requiring specialized medical equipment and treatment), staff training, and the building of specialized facilities, such as decontamination areas. For mass casualty incidents, local officials may need to plan for the provision of medical care in a non-hospital environment if there is no capacity left in hospitals. They may also need to rely on mutual aid agreements with nearby jurisdictions.

The Pandemic and All Hazards Preparedness Act of 2006 transferred the National Bioterrorism Hospital Preparedness Program (NBHPP) from HRSA to the Assistant Secretary for

Preparedness and Response (ASPR). The focus of the program is now all-hazards preparedness and not solely bioterrorism, and it is now called the Hospital Preparedness Program (http://www.hhs.gov/aspr/opeo/hpp/index.html).

Hospitals, outpatient facilities, health centers, poison control centers, EMS and other health care partners work with the appropriate state or local health department to acquire funding and develop health care system preparedness through this program. Funding is distributed directly to the state or local health department, cities, or counties, as appropriate.

While hospital preparedness is a vital part of preparedness for a public health emergency, it is important to realize that these activities are often separate from the activities of the larger scope of public health. Hospitals and public health agencies have similar goals of ensuring that people stay healthy, but their focus is different. Hospitals are concerned with individuals while public health agencies focus on the larger community. In addition, hospitals may be run as part of the private or public sector and not directly under government control, unlike public health agencies, which are always a government function. Regardless, in establishing and practicing emergency preparedness plans, it will be important to coordinate the efforts of hospitals and public health, as well as poison control centers, blood banks, and other health entities on the local level.

INFORMATION SHARING IN THE PUBLIC HEALTH COMMUNITY

Once lab tests confirm the presence of a biological, chemical, or radiological agent or contaminant, information will need to be distributed throughout the medical community quickly to facilitate identification of additional patients and advise health care providers about treatment. Over the past several years, CDC has been developing several national networks to encourage and facilitate the sharing of information within the public health community. The networks are designed to help health officials and hospitals around the country share information both before and during public health emergencies.

Health Alert Network

The Health Alert Network (HAN) (http://www2a.cdc.gov/han/index.asp) is a nationwide, integrated electronic information and communications system for the distribution of health alerts, prevention guidelines, national disease surveillance, and laboratory reporting. HAN is a collaboration between CDC, local and state health agencies, and national public health organizations. It allows for the sharing of information between state, local, tribal, and federal health agencies as well as hospitals, laboratories, and community health providers.

HAN is designed to assist public health and emergency response during a terrorism event or other public health emergency. It provides early warnings by broadcast fax and e-mail to alert officials at all levels about urgent health threats and appropriate actions. There are three categories of HAN messages:

- **Health Update:** provides updated information regarding an incident or situation; unlikely to require immediate action
- **Health Advisory:** provides important information for a specific incident or situation; may not require immediate action

- **Health Alert:** conveys the highest level of importance; warrants immediate action or attention

HAN messages are openly available on the Internet(http://www2a.cdc.gov/HAN/Archivesys/), but there is a short delay after HAN messages are broadcast to users before they are posted on the Web site (generally an hour or less). It is important to remember that HAN messages are also available to the media, so anything that appears on the HAN is a public information issue. If you are interested in signing up to receive HAN messages, contact your local or state health department and ask for their state HAN coordinator or Bioterrorism coordinator (varies by state).

Many states have developed their own HAN networks. CDC is providing funding and technical assistance for state networks in conjunction with other health organizations, such as the National Association of County and City Health Officials and the Association of State and Territorial Health Officials.

> "During all of the reports about smallpox, we saw so much information in the local papers. So I created a local HAN for first responders. If issues were reported in the local papers or on television, I went on the CDC Web site and pulled the relevant information, and adapted it for the firefighters on the trucks."
>
> *Chris Dechant, Metropolitan Medical Response System Captain/Coordinator (Glendale, AZ)*

CONTAINING PUBLIC HEALTH THREATS

Once an attack has been confirmed, public health officials may use a variety of tactics to control its effects, ranging from distributing antibiotics to using quarantine strategies. This section describes several methods that might be used for containment.

STRATEGIC NATIONAL STOCKPILE

The Strategic National Stockpile (SNS) (http://www.bt.cdc.gov/stockpile/index.asp) is a national repository of critical medical supplies and equipment designed to supplement and resupply state and local public health agencies in the event of a national emergency anywhere and at anytime within the United States or its territories. The Public Health Service Act (section 319F-2), officially specifies that the SNS is maintained to provide for the emergency health security of the United States. The SNS is managed by CDC's Division of Strategic National Stockpile (DSNS) working in conjunction with state and local communities who have responsibility for developing their own local plans for the receipt and distribution of SNS supplies and equipment. DSNS deploys medical supplies and equipment, some of which is configured and packed as 250-bed Federal Medical Stations (FMS)—it does not operate or staff mass casualty centers or clinics.

What SNS Includes

The SNS contains multiple caches of medical supplies and equipment stored in warehouses across the country. These caches include antibiotics, chemical antidotes, antitoxins, life-support medications, intravenous (IV) administration, ventilators, airway maintenance supplies, various medical/surgical items, and deployable FMS assets. Items included in the SNS are based upon threat assessments, the vulnerability of the U.S. civilian population, and availability and ease of distribution of supplies.

How SNS Is Activated and Managed

- The affected state's Governor's office requests SNS materials from HHS or CDC.
- HHS works with state and local representatives to assess the situation and determine prompt and appropriate action. This assessment could include consultation with other federal agencies and entities (e.g., the U.S. Department of Homeland Security [DHS]).
- Supplies may be sent in a "12-hour Push Package," which contains a broad range of products potentially needed in the early hours of an emergency to support mass treatment or prophylaxis of bioterrorist threats. The 12-hour Push Packages are maintained in a ready state for loading on trucks or aircrafts. Supplies would go directly to pre-designated Receiving, Staging and Storage Sites (RSS), depending on the situation and the plans already made by the affected community.
- Additional supplies can be tailored to provide pharmaceuticals, supplies, and/or products specific to the suspected or confirmed agent(s). These shipments can begin within 24–36 hours in addition to or instead of 12-hour Push Packages.

  An FMS unit may be deployed when treatment or quarantine capability is required. FMS units are designed to provide low to mid-level acuity of care or quarantine for 250 patients and can be employed as a platform for Special Needs Shelters, quarantine station, or an alternate care facility to augment community hospital capacity or capability. FMS is intended to be installed in an existing structure (building or tentage) near an existing hospital.
- Local and state officials are responsible for the receipt, storage, and security, as well as distribution of SNS supplies once they arrive at agreed upon receiving sites.
- However, while SNS supplies are in transit, DSNS will deploy its Technical Advisory Response Unit to provide technical assistance and advice in receiving and distributing supplies upon arrival at the RSS. Local and state officials are also responsible for the reception, installation, and operation of FMS units. As with other material, DSNS will provide technical support to assist with receipt, installation, and transfer of FMS assets.

CITIES READINESS INITIATIVE

The Cities Readiness Initiative is a pilot program, begun in 2004, that now provides funding to 72 metropolitan areas throughout all 50 states to improve their operational capability to receive, distribute, and dispense SNS assets. In the wake of a major public health emergency, this program aims to prepare each designated city to provide medicine and medical supplies to its entire population within 48 hours of the time of the decision to do so. For a complete listing of cities and more information about the program, visit http://www.bt.cdc.gov/cri/.

VACCINATION STRATEGIES

Vaccination is an important outbreak control measure for some illnesses. However, vaccines are not available for many diseases and not all vaccines work the same way. Smallpox vaccine, for example, provides almost immediate immunity and can be beneficial even if someone is vaccinated a few days after exposure. Other vaccines, such as the anthrax vaccine, may require a number of doses over time before the recipient builds up immunity. Therefore, vaccines may or

may not be helpful in a sudden outbreak, depending on the disease and incident. Scientists are currently doing research on vaccines to combat various bioterror agents, but currently, the only major bioterror agents for which vaccines are available in case of an attack are smallpox and anthrax. These vaccines are not currently available to the general public due to potential vaccine side effects and other issues. However, it is important to know these vaccines may become available in the case of an attack. It is important for public officials to know what options for vaccination will be available, because in the case of an attack, decisions about vaccination will have to be made quickly.

Smallpox Vaccination

Although vaccination before a smallpox event has been a hotly debated topic over the past several years due to potential side effects of the vaccine, in the case of a smallpox "outbreak," it is likely that public health officials would turn to vaccination because the risks associated with the smallpox illness would be much higher than the risks of the possible vaccine side effects. There are two main ways to conduct vaccination for smallpox:

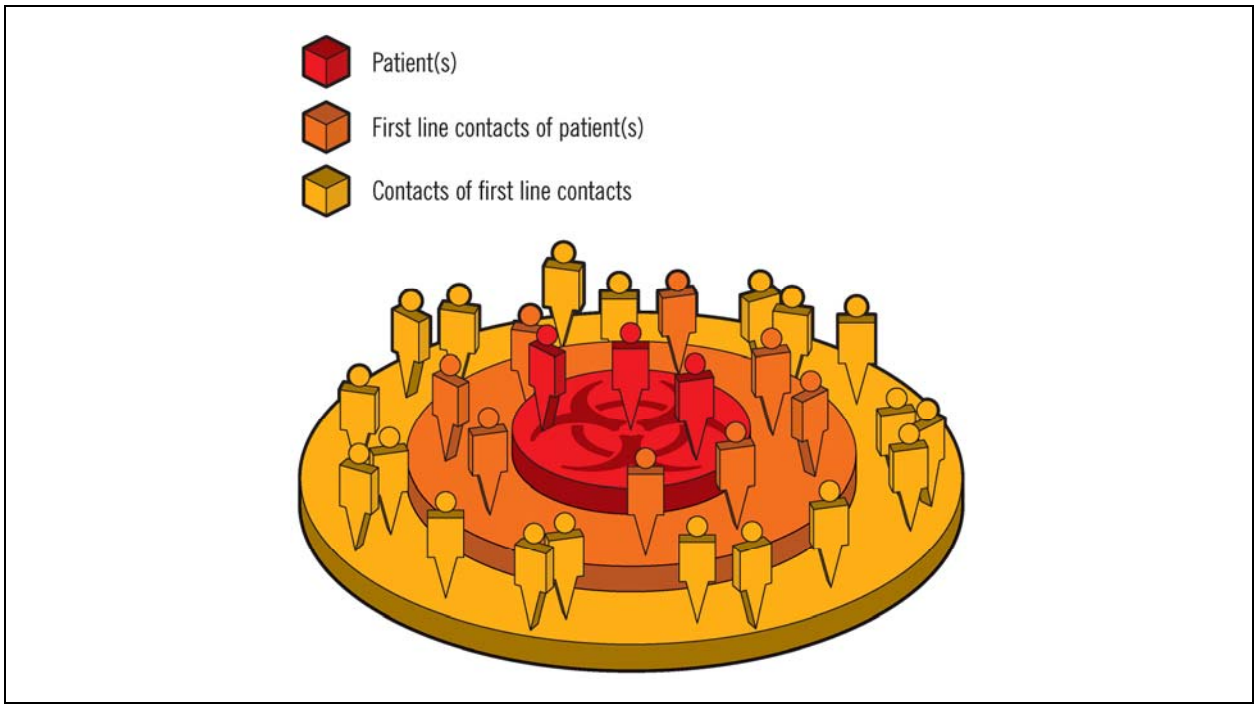
- Ring vaccination
- Mass vaccination

Ring Vaccination

Ring vaccination was the primary strategy used to control smallpox outbreaks in the past and led to the complete eradication of the disease worldwide by 1980. It involves finding and vaccinating the contacts of smallpox patients. First line contacts are those who have had face-to-face contact (6 feet or less; for example, at school or the workplace) and those living in the same household as the person who has smallpox. Then, close contacts of the first line contacts are vaccinated to make sure to break the chain of transmission. For the contacts of contacts, those who have what are called contraindications (medical conditions that may cause adverse reactions to the vaccine; for example, eczema or immune deficiencies) are not typically vaccinated.

Ring vaccination is typically effective if the outbreak appears to be small and contacts can be identified quickly. It minimizes the number of people who will need to be vaccinated and who may have reactions to a vaccine.

FIGURE 2–2: RING VACCINATION



Source: CDC & the World Health Organization. (2003). Course: "Smallpox: Disease, prevention, and intervention." Day 2, Module 4: Vaccination strategies to contain an outbreak. PowerPoint presentation. http://www.bt.cdc.gov/agent/smallpox/training/overview.

Mass Vaccination

Depending on the nature of the outbreak, it is possible that public health officials may decide to use a mass vaccination strategy. Some reasons that a mass vaccination may be used include: if the number of cases is high, if outbreaks occur in a number of locations, and/or if the outbreaks continue to grow despite the use of ring vaccination. Because routine vaccination for smallpox in the United States ended for the general public in 1972 and there are large numbers of Americans who are susceptible to the virus, mass vaccination would be strongly considered for a smallpox outbreak. If mass vaccination were indicated, supplies from SNS would be used, and local plans for vaccine clinics would be put into action in affected areas. Public health departments across the country have been developing vaccination plans in the event of a smallpox outbreak as part of their preparedness efforts. Talk with your public health officials to learn more about specific plans for your locality.

HOW A VACCINATION CLINIC OR MEDICINE DISTRIBUTION SITE MIGHT FUNCTION

Although most communities have done advance planning in terms of where clinics and dispensing sites may be held and how they will work, the exact location and setup will be incident specific. In such situations, it may be most useful to coordinate with the local media to get information out about who should go to one of these sites and where and when they will be open.

HHS has also recommended that, if a clinic or dispensing site (also referred to as a Point of Dispensing [POD]) needs to be used, the center should be open for the local media to tour before it is officially opened so that local media can provide information to the public about what to expect when they arrive at the site.

Public health officials will recommend that people bring the following information to receive appropriate treatment and preventative medicine:

- Photo identification (driver's license, military ID, company badge)
- Medical records, including previous immunizations, current medications, and allergies
- Current age and weight of children

It is helpful for people to gather this information before the emergency and keep it in a safe but easily accessible place.

This information would be requested strictly for medical reasons. Anyone who needs treatment or preventative medicine will be able to get it free of charge and regardless of immigration and residency status.

CRITICAL INFECTION CONTROL MEASURES—ISOLATION AND QUARANTINE

To protect the public in the case of an outbreak of a highly contagious infectious disease, such as smallpox or plague, public health officials may employ quarantine and isolation strategies, separately or together, depending on the situation. These practices can reduce the public's exposure to an illness by separating and restricting the movements of persons known to be infected or who are suspected of infection. Both practices may be carried out voluntarily, but ultimately, government officials have the authority to impose quarantine and isolation, if necessary, to protect the public welfare.

Isolation removes people who are ill with contagious diseases from the general public and restricts their activities to stop the spread of a disease. Isolation is not required for patients with noncontagious diseases, such as anthrax.

Isolation:

- Confines infected persons to their homes, hospitals, or designated health facilities
- Allows health care providers to provide infected persons with specialized care

- Is commonly used in hospitals for people with certain diseases, such as tuberculosis
- Is initiated mostly on a volunteer basis, but government officials at all levels have the authority to enforce it (Centers for Disease Control and Prevention, 2004b)

Quarantine separates people who have been potentially exposed to a contagious disease and may be infected, but who are not yet ill, to stop the spread of that disease.

Quarantine:

- Confines persons to their homes or community-based facilities
- Can apply to a group that has been exposed at a public gathering
- Can apply to persons who are believed to have been exposed while traveling, particularly overseas
- Can apply to an entire geographic area, in which case a community may be closed off by sealing its borders or by a barricade, traditionally known as a *cordon sanitaire*
- Is enforced at the state level and/or by CDC's Division of Global Migration and Quarantine

For more information on the legal issues surrounding isolation and quarantine, see section 7, Legal and Policy Considerations.

FEDERAL MEDICAL RESPONSE TEAMS

As the lead federal agency under the National Response Plan for Public Health and Medical Support, HHS has two primary sources for medical teams that can be quickly deployed to assist tribal, state, and local health officials—the U.S. Public Health Service Commissioned Officer Corps and the National Disaster Medical System teams described below. In addition to these teams, HHS may also reach out to the Department of Veterans Affairs and the Department of Defense if more medical personnel are needed.

U.S. Public Health Service Commissioned Officer Corps

The U.S. Public Health Service (USPHS) Commissioned Officer Corps, one of the seven uniformed U.S. services, is a unique source of 6,000 dedicated public health professionals who are available to respond rapidly to urgent public health challenges and health care emergencies. The USPHS Commissioned Officer Corps, led by the Surgeon General, will be a key personnel resource in a public health emergency.

The USPHS Commissioned Officer Corps will have 14 teams ready to deploy to assist in major public health emergencies. These include:

- Five deployable Rapid Deployment Force (RDF) teams—each RDF team will have USPHS officers trained to manage and staff Federal Medical Shelters (500 beds/team), Special Needs Shelters, community primary care services, immunization campaigns, and other general medical capabilities

- Four Applied Public Health teams—each with USPHS officers with experience and training to address needs in water safety; sewage, solid waste, and other environmental challenges; disease surveillance; and public health communications
- Five Mental Health teams—each with USPHS officers who are subject matter experts to help assess and provide early intervention in mental health requirements in disaster settings

National Disaster Medical System

If a state requires additional help to respond to a public health emergency, it can often obtain additional medical staff through prearranged mutual aid agreements. In addition, the federal government can offer help through the National Disaster Medical System (NDMS) (http://ndms.dhhs.gov). NDMS is a program designed to provide a range of emergency medical services to support local response. It is a federally coordinated system involving collaboration with states and other appropriate public or private organizations. This system is made up of medical professionals who are specially trained and who can provide their services in case of an emergency as a supplement to local hospital systems. All NDMS members become temporary federal employees when NDMS is activated.

The Secretary of Health and Human Services is authorized to activate NDMS in the following situations: (1) to provide health-related and other appropriate services to assist victims of a public health emergency (whether or not officially declared as such), or (2) to be present in an area for a limited time that the Secretary deems at risk for a public health emergency. When the Secretary has activated NDMS at the federal level, the services are paid for by the federal government. In certain circumstances, state governments may request services from NDMS when the Secretary has not activated NDMS at the federal level. In these cases, the states will need to reimburse NDMS for any services they request. To request NDMS assistance, officials will work with the federal liaison staff at the state Emergency Operations Center and Joint Field Office to develop a medical assessment document that lists their needs. The request is then sent to the Federal Emergency Management Agency at the federal level for approval and action.

The five types of NDMS teams are:

- Disaster Medical Assistance Teams
- Disaster Mortuary Operational Response Teams
- National Veterinary Response Teams
- National Nurse Response Teams
- National Pharmacy Response Teams

Each of these teams will be described below.

Disaster Medical Assistance Teams

- Twenty-six teams across the country, composed of 35 local professional and paraprofessional medical personnel and logistical staff each; 20 additional teams are currently in development.
- Include four National Medical Response Teams, which are specially equipped and trained to deal with Weapons of Mass Destruction, and other specialized teams available to handle specific medical needs, such as burns, mental health, crash injuries, and pediatric emergencies.

- Designed as rapid-response units to supplement local services (e.g., triage, emergency care) until a situation is resolved or until additional resources—federal or private—can be activated.
- Deployed to affected areas with enough supplies to last 72 hours.
- May work at fixed or temporary medical sites.
- Each team is managed by a sponsoring organization, such as a public health agency or a nonprofit group, which operates under a Memorandum of Agreement with HHS.

Disaster Mortuary Operational Response Teams

- Ten regional teams formed to provide help to local officials in tasks relating to the recovery, identification, and burial of victims.
- One national team is specially trained to handle events involving Weapons of Mass Destruction.
- Members are private citizens with specialized expertise.
- Examples of types of team members include: funeral directors, medical examiners, coroners, and pathologists.
- Include two Disaster Portable Morgue Units, which are complete morgues that can be deployed to an affected site.

National Veterinary Response Teams

- Five nationally deployable teams of private citizens who provide veterinary care following major emergencies
- Examples of tasks include the following:
    - Medical treatment for rescued animals, farm animals, and pets
    - Tracking and assessment of disease in animals
    - Animal decontamination
- Examples of types of team members include:
    - Clinical veterinarians
    - Veterinary pathologists
    - Veterinary technicians
    - Microbiologist/virologists
    - Epidemiologists
    - Toxicologists

National Nurse Response Teams

These teams are currently being formed to assist with mass vaccinations and provide specialized services in case the nation's supply of nurses is overwhelmed during a major emergency. There will be 10 regional teams, which will each consist of approximately 200 civilian nurses, including burn nurses.

National Pharmacy Response Teams

Ten regional teams are being formed to help with emergency situations that may require the assistance of large numbers of pharmacy professionals, such as mass vaccinations. Members will be sponsored by the Joint Commission of Pharmacist Practitioners and will work in partnership with HHS.

Federal Coordinating Centers

In addition to the five types of teams, NDMS also coordinates a network of approximately 2,000 hospitals to assist in a disaster. NDMS relies on the voluntary assistance of accredited hospitals across the country—usually those with more than 100 beds and located in large metropolitan areas. Federal Coordinating Centers recruit these hospitals to commit a number of their acute-care beds for NDMS patients, if needed. If a hospital admits NDMS patients in an emergency, it is reimbursed by the federal government subject to available funding.

In the case of a major disaster, the Federal Coordinating Centers may coordinate the evacuation or transport of patients to NDMS network hospitals in unaffected areas. These activities are coordinated with DOD, which would be responsible for transporting patients over long distances.

OTHER HHS SUPPLEMENTARY PERSONNEL AND RESOURCES

In response to a public health emergency, the federal government may dispatch personnel from the Epidemic Intelligence Service (EIS) or the Medical Reserve Corps.

EIS (http://www.cdc.gov/eis) is a 2-year postgraduate program of service and on-the-job training for health professionals interested in epidemiology. EIS, which is managed by CDC, was developed more than 50 years ago to defend the nation against biological warfare. It also provides surveillance and response units for all types of outbreaks. Medical doctors, researchers, and scientists work in a range of subject areas, including infectious diseases, and are supervised by experienced epidemiologists at CDC and local and state health departments.

The Medical Reserve Corps (http://www.medicalreservecorps.gov) are teams of local volunteer medical and public health professionals who have offered to contribute their skills and expertise during times of community need. The Medical Reserve Corps program office is within HHS' Office of the Surgeon General, but the volunteer teams are operated out of local Citizen Corps, a national network of volunteers concerned with preparing their communities for disasters of all kinds.

AMERICAN RED CROSS

The American Red Cross (http://www.redcross.org) is another key player in responding to a public health emergency. The American Red Cross is a nonprofit humanitarian organization staffed mostly by volunteers and has been providing disaster recovery assistance to Americans since the 1880s. Although not a government organization, the American Red Cross was given

authority through a Congressional Charter in 1905 to provide assistance in disasters, both domestically and internationally. As a result, American Red Cross Chapters work closely with federal, tribal, state, and local governments to respond to disasters.

The following are some of the services offered by the American Red Cross in a disaster:

- Emergency first aid
- Health care for minor injuries and illnesses at mass-care shelters or other sites
- Supportive counseling for victims and those affected by the event
- Personnel to assist at temporary infirmaries, immunization clinics, morgues, hospitals, and nursing homes
- Assistance with meeting basic needs (e.g., food, shelter)
- Provision of blood products

In addition to the American Red Cross, it is likely that many other volunteer organizations will also be involved in a response to a public health emergency in your community.

PANDEMIC INFLUENZA: PREPAREDNESS AND RESPONSE

The possibility of a future pandemic influenza outbreak is a concern among many public health officials. While this chapter generally describes the public health system's response to terrorism and other public health emergencies, many of the same methods and response activities would be employed in the event of a pandemic influenza outbreak.

For example, to prepare for a possible pandemic, federal health officials are currently:

- Monitoring disease spread internationally to support rapid response
- Developing vaccines and vaccine production capacity
- Stockpiling antiviral drugs and other medical countermeasures
- Coordinating preparedness and response planning with tribal, state, and local health officials
- Improving outreach and public communications planning

Many tribal, state, and local health departments are also in the process of developing their own pandemic preparedness plans. More detailed basic information on pandemic influenza can be found in appendix E (p. 145).

Additional resources and information on pandemic influenza, including the HHS Pandemic Influenza Plan and informational and planning resources for many audiences, such as individuals, schools, businesses, health care providers and facilities, and communities can be found at http://www.pandemicflu.gov.

3. THE KEY FUNCTIONS OF FEDERAL GOVERNMENT PUBLIC HEALTH AGENCIES IN AN EMERGENCY

SECTION HIGHLIGHTS

This section provides an overview of how federal health agencies function in an emergency and what kind of assistance they may provide.

- The National Response Plan (NRP) coordinates federal assistance to tribal, state, and local authorities when federal assistance is needed.
- The U.S. Department of Health and Human Services (HHS) is the lead federal agency for protecting the health of all Americans, but overall emergency response is coordinated by the U.S. Department of Homeland Security (DHS).
- Different federal agencies take the lead depending on the type of emergency (e.g., natural disasters, natural outbreaks, bioterrorism attacks, chemical incidents, radiological incidents).

Although a great deal of the response to a terrorism event or other public health emergency will take place at the local, state, or tribal government level, the federal government generally supports the local, state, and tribal response when one or more of the following occurs:

- A state requests assistance from the federal government and the President
- The President declares a state of emergency or a major disaster
- An incident takes place in areas that are owned or controlled by the federal government

The overall federal response is coordinated through DHS and will operate in support of and coordination with the Incident Command System, which is guided by NIMS. Detailed information on NIMS can be found at http://www.fema.gov/emergency/nims/index.shtm.

NATIONAL RESPONSE PLAN

A more comprehensive picture of the federal response to emergencies can be found in the National Response Plan (NRP) at http://www.dhs.gov/nrp. The NRP is an all-discipline, all-hazards plan that establishes a single framework for the management of domestic incidents. It provides the structure and mechanism for the coordination of federal response to tribal, state, and local governments for catastrophic incidents, including natural disasters and terrorist attacks. Please note that the NRP does not supersede incident management at the local level. It is only operational in an "Incident of National Significance," which is defined in the NRP as "an actual or potential high-impact event that requires a coordinated and effective response by an appropriate combination of federal, state, local, and nongovernmental and/or private sector entities in order to save lives and minimize damage and provide the basis for long-term community recovery and mitigation activities." Emergency Support Function (ESF) #8, the

Public Health and Medical Service Annex, provides information specific to health and medical emergencies (see http://www.au.af.mil/au/awc/awcgate/frp/frpesf8.pdf).

WHAT TO EXPECT FROM HHS

HHS is the U.S. government's principal agency for protecting the health of all Americans. The overall goal of HHS' preparedness and response program is to ensure sustained public health and medical preparedness within our communities and our nation in defense against terrorism, infectious disease outbreaks, medical emergencies, and other public health threats.

In a public health emergency, HHS' responsibilities include:

- Monitoring, assessing, and following up on people's health
- Ensuring the safety of workers responding to an incident
- Ensuring that the food supply is safe
- Providing medical, public health, and mental/behavioral health advice
- Establishing and maintaining a registry of people exposed to or contaminated by a given agent

To fulfill this role, HHS works closely with tribal, state, and local public health departments, DHS, other federal agencies, and medical partners in the private and nonprofit sectors. Under the Public Health Service Act, HHS has the authority to:

- Declare a public health emergency (HHS Secretary)
- Make and enforce regulations (including those regarding isolation and quarantine) to prevent the introduction, transmission, or spread of communicable diseases into the United States or from one state or possession into another
- Conduct and support research and investigation into the cause, treatment, or prevention of a disease or disorder
- Direct the deployment of officers of the Public Health Service, a division of HHS, in support of public health and medical operations
- Provide public health and medical services and advice
- Provide for the licensure of biological products

CRISIS COUNSELING SERVICES

If there is a Presidential Declaration of Disaster, HHS' Substance Abuse and Mental Health Services Administration (SAMHSA) has a cooperative agreement with the Federal Emergency Management Agency to administer the Crisis Counseling Assistance and Training Program. This program provides funds for crisis counseling, outreach, and training activities for direct and indirect victims of disasters and other emergencies.

The SAMHSA Emergency Response Grant program provides limited resources for communities needing mental health and substance abuse emergency response services when a presidential declaration of disaster has not occurred.

HHS FUNDING AVAILABLE FOR PUBLIC HEALTH PREPAREDNESS

HHS provides funding annually to states, territories, and selected municipalities to strengthen their ability to respond to terrorism and other public health emergencies. In 2006, HHS provided $1.2 billion in funding—$766.4 million through CDC to strengthen public health preparedness overall and $460 million through HRSA to improve hospital preparedness. (Please note that as of December 2006, hospital funding is provided through the HHS Hospital Preparedness Program.) The latest funding information and news about HHS public health emergency preparedness activities can be found at http://www.hhs.gov/aspr/.

DHS also provides information on other grants related to disaster and emergency preparedness at http://www.dhs.gov/xopnbiz/grants/.

HOW HHS WORKS WITH OTHER FEDERAL AGENCIES: WHO IS RESPONSIBLE FOR WHAT IN DIFFERENT SITUATIONS

IN ALL EMERGENCY SITUATIONS

In all disasters, HHS' Secretary's Operations Center becomes operational immediately upon notification and begins the collection, analysis, and dissemination of requests for medical and public health assistance.

HHS operates under the NRP in all situations involving an "Incident of National Significance," declared by the Secretary of Homeland Security under these criteria:

- A federal department or agency acting under its own authority has requested the assistance of the Secretary of DHS.
- The resources of state and local authorities are overwhelmed and federal assistance has been requested by the appropriate state and local authorities.
- More than one federal department or agency has become substantially involved in responding to an incident.
- The Secretary of DHS has been directed to assume responsibility for managing a domestic incident by the President.

Please refer to sections 4 and 5 of this guide for more specific information regarding food security and water/environmental issues, respectively.

IN A NATURAL DISASTER

- DHS coordinates the federal response to a natural disaster, which may include floods, earthquakes, hurricanes, tornadoes, fires, droughts, and epidemics.
- As in all crises, the HHS Secretary's Operations Center will lead federal medical and public health support to local and state governments.
- HHS will also gather and analyze data to help identify, monitor, and manage medical and health consequences for the public.
- HHS' activities will be closely coordinated with several other agencies and organizations, including the Federal Emergency Management Agency under DHS, the National Guard and Reserve, and the American Red Cross.

IN A NATURAL OUTBREAK

- HHS will, through CDC, work closely with local and state public health officials to identify, track, and monitor outbreaks of diseases.
- Disease surveillance and detection systems, including NEDSS, provide the framework for communication of public health information throughout the nation and help public health officials detect and fight outbreaks.
- In coordination with DHS, HHS will provide direct public health support—both staff and medical supplies—to a state, if requested by its leadership (see the NRP's Biological Incident Annex at http://www.dhs.gov/xlibrary/assets/NRP_FullText.pdf).
- Many federal agencies would play a role in the management of an outbreak considered to be an Incident of National Significance, such as pandemic influenza or serious emerging infectious disease.
- HHS will lead all federal public health and medical responses for such an incident.

IN A BIOTERROR ATTACK

- HHS leads federal public health and medical response in a bioterrorist incident because response and recovery efforts will rely on public health and medical emergency response.
- The Assistant Secretary for Preparedness and Response will coordinate responses with DHS and other federal and state agencies from the HHS Secretary's Operations Center.
- HHS will lead the federal public health and medical response to a bioterror attack (see the NRP's Biological Incident Annex at http://www.dhs.gov/xlibrary/assets/NRP_FullText.pdf).

IN A CHEMICAL INCIDENT

- HHS will work as part of the emergency management team in the emergency operations center of the agency with primary responsibility, the Environmental Protection Agency or the DHS/U.S. Coast Guard (see the NRP's Oil and Hazardous Materials Annex and ESF #10 at http://www.dhs.gov/xlibrary/assets/NRP_FullText.pdf.) in the event that the emergency activates ESF #8.

- CDC, through its Agency for Toxic Substances and Disease Registry (http://www.atsdr.cdc.gov) and National Institute for Occupational Safety and Health (http://www.cdc.gov/niosh/topics/emres), will assume roles in evaluating chemical spills and environmental contamination and providing safety and health recommendations to responders (e.g., the wearing of personal protective equipment).

- HHS will determine whether illnesses, diseases, or complaints may be attributed to exposure to a hazardous substance. It will establish disease exposure registries, conduct appropriate testing, and provide information on the health effects of toxic substances.

WHEN RADIOLOGICAL MATERIALS HAVE BEEN RELEASED

- DHS is responsible for the overall coordination of incident management activities for all radiological or nuclear Incidents of National Significance.

- If radiological materials have been released, HHS will work in cooperation with the emergency operations center of DHS and/or the agency it appoints as the coordinating agency. For example:

    - Radiological terrorism incidents would be initially coordinated by the U.S. Department of Energy (DOE), unless the material or facilities were either owned or operated by DOD or licensed by the Nuclear Regulatory Commission. In those cases, the respective agency would serve as the coordinating agency.

    - Radiological terrorism incidents include:

      Radiological Dispersal Device (e.g., radioactive material plus conventional explosives)

      Improvised Nuclear Device (e.g., "suitcase bomb," crude nuclear bomb)

      Radiation-Emitting Device (e.g., hidden, not exploded, radiological materials used to expose people to radiation, sometimes referred to as a "silent" source)

- Management of an incident at a nuclear facility would be coordinated by the agency that licenses, owns, or operates the facility; this would be the Nuclear Regulatory Commission, DOD, or DOE. For nuclear facilities not licensed, owned, or operated by a federal agency, the Environmental Protection Agency would coordinate incident management.

- In the event of a nuclear weapon accident/incident, DOD or DOE would serve as the coordinating agency, based on custody at the time of the event.

- HHS will assess, monitor, and follow people's health; ensure the safety of workers and responders involved in the incident; ensure that the food supply is safe; and provide medical and public health advice.
- If there is a mass casualty situation, the American Red Cross will take a lead role in management as well.

KEY HHS AGENCIES INVOLVED IN PUBLIC HEALTH EMERGENCY RESPONSE UNDER EMERGENCY SUPPORT FUNCTION #8 OF THE NRP

- Administration for Children and Families (ACF)
- Administration on Aging (AoA)
- Centers for Disease Control and Prevention (CDC)
- Centers for Medicare and Medicaid Services (CMS)
- Food and Drug Administration (FDA)
- Health Resources and Services Administration (HRSA)
- National Institutes of Health (NIH)
- Substance Abuse and Mental Health Services Administration (SAMHSA)

There are many other agencies that work with HHS as part of the response to public health emergencies. For a list of these agencies, see Emergency Support Function #8, the Public Health and Medical Services Annex of the NRP (http://www.dhs.gov/xlibrary/assets/NRP_FullText.pdf).

4. FOOD SECURITY AND FOOD SUPPLY

SECTION HIGHLIGHTS

This section describes potential food security risks and information on the role of federal agencies in food security.

- The three federal agencies that play major roles in food safety and security are the Food and Drug Administration (FDA) under HHS, the U.S. Department of Agriculture (USDA), and the U.S. Department of Homeland Security (DHS).
- It may be difficult to differentiate between an unintentional and a deliberate outbreak of foodborne illness.
- Risks to the food supply may come during the growing, manufacturing, transportation, or distribution process.
- State and local public health authorities can provide more information about the specific risks in your community.

IMPACT OF FOODBORNE ILLNESSES

Most experts believe that terrorist acts involving the food supply fall into the category of low probability but high consequence. However, experts are concerned because contaminating food does not require as much technical skill and organization as does weaponizing anthrax. In addition, opportunities for access to the food supply stretch from farms and feedlots to restaurants and cafeterias. For example, terrorists could introduce an agent during the harvesting, packing, shipping, delivery, or preparation stage. And due to the rapid food distribution system in the United States, contaminated food could be widespread.

Contamination of the food supply could have a devastating public health and economic impact, with the possibility of global consequences. For example, fearful public reaction to bovine spongiform encephalopathy, also known as BSE or "mad cow disease," and the refusal of major importing nations, such as Japan, to import U.S. beef beginning in December 2003 demonstrated how quickly a domestic, food-related health issue can become a global economic issue.

Because contamination of the food supply by terrorists is a potential threat, it is important to recognize and identify the potential food safety risks in all communities as well as risks that are unique to certain communities.

Risks to communities include threats to:

- Supermarkets
- Restaurants
- Fast food chains

- Other food service establishments, such as cafeterias
- Food distribution centers and warehouses

The extent of these risks may vary in different areas. For example, there are greater risks in a tourist area with many restaurants. You should also pay special attention when large special events (e.g., sports events, conventions) take place.

Risks to specific communities are threats involving the food growing, manufacturing, transportation, and distribution processes. The risks to your area will depend on whether any of these processes occur in your community. For example, Maryland's Eastern Shore is home to many poultry plants; Wisconsin is a leading dairy state. The following questions will help you think about food supply threats in your jurisdictions:

- Are there farms or dairies in your area?
- Are there slaughterhouses in your community?
- Are there food processing or manufacturing plants in the community?
- Are there food packing facilities nearby?
- Are there transshipment points locally (e.g., large warehouses, distributors)?

It is likely that your local and state health departments are preparing for these specific threats to your area and can provide you with more information on the measures they are taking.

INTENTIONAL VERSUS UNINTENTIONAL OUTBREAK OF FOODBORNE ILLNESS

Being able to detect the difference between an intentional and an unintentional outbreak of foodborne illness is difficult because outbreaks of foodborne illness are more common than most people realize and occur every year in the United States. They include infections caused by bacteria such as Salmonella, Shigella, E. coli, and Listeria; and by parasites such as Cryptosporidium and Cyclospora. Foodborne illnesses cause symptoms such as nausea, vomiting, diarrhea, or fever. These symptoms can occur between 1 hour and 3 weeks after eating contaminated food, depending on the agent ingested (bacterial, viral, or parasitic). According to the Centers for Disease Control and Prevention (CDC), there are approximately 76 million illnesses; 325,000 hospitalizations; and 5,000 deaths every year due to naturally occurring foodborne illnesses in the United States (Mead et al. 1999). The exact numbers are unknown because many people wait for their symptoms to go away and do not see a doctor. Even if someone seeks professional medical advice, the health professional may not attribute the case to a foodborne illness and may not report it to the local health department. However, some of the causes of unintentional outbreaks, such as Salmonella and E. coli O157:H7, may also be used as terrorist agents. More information on the specific organisms can be found in the "Biological Agents" section of the appendices (see p. 98).

FEDERAL PARTNERS IN FOOD SAFETY AND SECURITY

Three federal agencies account for the majority of food and agriculture safety spending and regulatory responsibilities: FDA, within HHS; the Food Safety and Inspection Services (FSIS) and Animal and Plant Health Inspection Service (APHIS), both within USDA; and DHS. The Secretaries of HHS, USDA, and DHS have agreed to coordinate their responses to the various threats, risks, and vulnerabilities that the agrarian sector and food supply are facing (Dyckman, 2003). It might be helpful to understand these agencies' roles because you could work with them during a food contamination incident.

FDA

FDA is responsible for overseeing all domestic and imported food sold in interstate commerce, including shell eggs, bottled water, and wine beverages with less than 7 percent alcohol. FDA is also responsible for overseeing animal drugs, feeds, and veterinary devices. FDA inspections take a broad approach to food inspections to ensure that the overall food production process within a given establishment functions appropriately. To do this, FDA conducts a scientific evaluation and risk analysis to analyze potential hazards associated with the foods under its jurisdiction. Next, the agency identifies critical control points in a food's production at which the potential hazard could be controlled or eliminated; this includes processing, shipping, consumption, etc. Most importantly, FDA establishes preventative measures and procedures to monitor the correct use of these measures—for example, reprocessing or disposing of food if the minimum cooking temperature was not reached. Once proper preventative measures and monitoring procedures are in place, FDA does a comprehensive evaluation of a specific food establishment about every 5 years. FDA has about 770 inspectors for 57,000 food establishments and 132 ports and has 39 contract and 37 partnership agreements with states to assist with domestic inspection activities. In addition, FDA works closely with state and local food safety officials on food safety inspections at the retail level.

USDA

In contrast, FSIS is responsible for the ongoing inspection of the foods under its jurisdiction. FSIS protects consumers by ensuring that meat, poultry, and egg products (e.g., dried egg yolks, scrambled egg mix, liquid eggs)—foods not inspected by FDA—are safe, wholesome, and accurately labeled. Due to the fact that the production of these foods requires the slaughter of animals, many USDA inspections focus on ensuring sanitary conditions for all slaughter and processing activities. This type of scrutiny requires frequent—even daily—onsite inspections. FSIS has more than 7,600 inspectors and veterinarians in over 6,000 meat, poultry, and egg product plants every day and at ports of entry to prevent, detect, and respond to food safety emergencies.

APHIS protects agricultural production and consumers from animal and plant pests and diseases, such as exotic fruit flies and foot-and-mouth disease, by enforcing strict sanitary and phytosanitary import requirements and conducting domestic agricultural pest and disease monitoring and surveillance. APHIS also works to safeguard agriculture and the public from harmful zoonotic—affecting animals and humans—diseases like BSE, or "mad cow disease," through the routine testing of samples.

CDC, the Environmental Protection Agency, and U.S. Customs and Border Protection (part of DHS) also have limited responsibilities for food security. CDC reports and tracks foodborne disease and works with state and local health departments to investigate and control the outbreak. The Environmental Protection Agency evaluates environmental safety (e.g., levels of pesticides and herbicides), and U.S. Customs and Border Protection monitors food imports.

FOOD RECALL

A food recall is a voluntary action by a manufacturer or distributor to protect the public from products that may cause health problems or possible death. Neither USDA nor FDA has mandatory recall authority. One exception for FDA is that infant formula recalls are mandatory. USDA will issue a recall announcement for recalls of foods under its jurisdiction. FDA will issue a recall announcement of foods it regulates if a company does not do so within 24 hours. These announcements are meant to alert consumers about dangerous foods that they could have in their homes.

ADDITIONAL INFORMATION

WEB SITES:

FDA Center for Food Safety and Applied Nutrition: http://vm.cfsan.fda.gov/

FDA regional offices: http://www.fda.gov/ora/inspect_ref/iom/iomoradir.html#orafield

USDA Food Safety and Inspection Services (FSIS): http://www.fsis.usda.gov

USDA Animal and Plant Health Inspection Service: http://www.aphis.usda.gov

CDC: http://www.cdc.gov/foodborneoutbreaks/

Association of State and Territorial Health Officials:
http://www.astho.org/pubs/foodsafety_final.pdf

PHONE NUMBERS TO REPORT SUSPECTED FOOD TAMPERING:

USDA hotline for suspected meat and poultry tampering: 1–888–674–6854

USDA Food Safety and Inspection Service 24-hour Office of Food Defense and Emergency Response number: 1–800–333–1284

FDA's 24-hour emergency number for reporting unsafe seafood, produce, or eggs: 1–301–443–1240; nonemergency number: 1–888–SAFEFOOD

5. ENVIRONMENTAL SAFETY AND TESTING

SECTION HIGHLIGHTS

This section describes potential bioterrorist threats to the air and water supply and the need for communities to be prepared, as well as the role of federal agencies in protecting the air and water supply.

- It is important to identify the water supply and distribution systems in your area, and to know where they are located.
- The U.S. Environmental Protection Agency (EPA) is the main federal agency responsible for water security. The U.S. Department of Health and Human Services (HHS) contributes during emergency response and recovery to provide technical assistance and support.
- In the event of a public health emergency involving a release of harmful chemical and biological agents into the air, several federal agencies might be involved in the response: the U.S. Department of Homeland Security (DHS), the Centers for Disease Control and Prevention's (CDC's) National Institute for Occupational Safety and Health (NIOSH), and EPA.
- Project Biowatch, a program of DHS in partnership with EPA and CDC, is an air-monitoring system that is intended to provide early warning in cases of airborne biocontaminants in urban areas.

WATER SUPPLY

Water has always been a strategic target during times of war, and the fear of a terrorist threat to the water supply is intense and widespread. As of this printing, no known terrorist act has ever involved the water supply. Most experts agree that the risk of casualties resulting from an attack on the water supply is low. This is because the toxins would be diluted by millions of gallons of water or inactivated by chlorination, ozone, or filters at water treatment plants (Johns Hopkins Center for Public Health Preparedness, 2004). Nonetheless, in the event of deliberate tampering with water supplies, people's confidence in the safety of drinking water will decline, while fear and anxiety rise, even if there is no health threat.

Water supply and distribution systems are vulnerable components of the nation's critical infrastructure. In addition to the water supply, the infrastructure for drinking and wastewater includes treatment plants, pumping stations, pipelines, and storage facilities. Nationally, there are more than 168,000 public drinking water facilities, with tens of thousands of miles of aqueducts and pipelines in remote rural areas and other unguarded locations.

Terrorist threats to the water supply include:

- Deliberate contamination with biological, chemical, or radiological agents
- Bombs or explosives at pumping stations or other critical facilities

- Sabotage and disruptions of the distribution of drinking water or firefighting supplies

Many environmental health experts are concerned about unguarded chlorine gas supplies at water treatment facilities, which terrorists could release into the air or water or put into the food supply. Most treatment plants use chlorine to kill bacteria and viruses in drinking water, but in stronger concentrations, chlorine causes choking and tissue damage and can be fatal (Centers for Disease Control and Prevention, 2003). To reduce terrorism risks that target chlorine, some treatment plants have converted to safer purification technologies, such as sodium hypochlorite.

The following questions will help you think about the potential threats to your community:

- Are there water treatment plants in your area?
- Are reservoirs or other water storage facilities located in your community?
- Are there water pipelines or aqueducts in your area?
- Are there water pumping stations nearby?

It is likely that your local and state health departments are working on preparing for these specific threats to your area and can provide you with more information on the measures being taken.

FEDERAL PARTNERS IN PROTECTING THE WATER SUPPLY

EPA, working in coordination with DHS, has primary responsibility for water infrastructure security. EPA is responsible for protecting the nation's water supply by enforcing the Clean Water Act (http://www.epa.gov/region5/water/cwa.htm), the Safe Drinking Water Act (http://www.epa.gov/safewater/sdwa/sdwa.html), and the Public Health Security and Bioterrorism Preparedness Response Act of 2002 (http://www.fda.gov/oc/bioterrorism/bioact.html).

Federal Agencies' Response to Water Emergencies

In the event of an attack on the water supply, you may be working with several federal agencies. While the role of HHS in water security is to provide technical assistance and support during emergency response and recovery, the Federal Emergency Management Agency and the Army Corps of Engineers may both have leading roles. Within CDC, the Environmental Public Health Readiness Branch of the National Center for Environmental Health works with federal, tribal, state, and local agencies after natural and technological disasters. CDC's environmental disaster epidemiologists help communities assess the impact of hurricanes, floods, and other extreme weather conditions on health and the water supply (http://www.cdc.gov/nceh/hsb/disaster/default.htm).

CDC's activities may include conducting laboratory tests on water samples to identify toxic contaminants, setting up surveillance programs to monitor the number of people with waterborne diseases or other serious health risks, setting up programs to control the spread of disease, and providing other support and technical assistance.

AIR

Terrorists could release harmful chemical and biological agents into the air, which might not be recognized for several days. An airborne communicable disease can spread through a ventilation system or pass person-to-person through coughing or sneezing before anyone realizes what has happened.

Noncommunicable bioagents, such as anthrax, also spread readily through the air. Technology has not kept pace with the need to detect these agents or remove them from the air by advanced surveillance and filtering techniques. Recognizing these technical gaps, the federal government is exploring several new biosurveillance programs, including new sensor networks and new health-tracking data analysis programs.

FEDERAL PARTNERS IN MONITORING THE SECURITY OF THE AIR WE BREATHE

DHS, through the Interagency Modeling and Atmospheric Assessment Center (IMAAC), is responsible for coordinating scientific cooperation among federal agencies to improve plume modeling and assessment capabilities. IMAAC is responsible for the production, coordination, and dissemination of reliable predictions and consequences for the release of airborne hazardous materials. These predictions will be provided to federal, tribal, state, and local emergency responders and other government officials as necessary to guide decisions and help officials determine the best responses to protect the public health (http://www.nrc.gov/reading-rm/doc-collections/commission/secys/2004/secy2004-0221/2004-0221scy.html).

NIOSH has primary responsibility for research and recommendations on air quality in the workplace, thus protecting the health of the workforce. In 2002, NIOSH issued detailed guidance for defending building environments against airborne chemical, biological, or radiological attacks (NIOSH, 2002).

BIOWATCH

Project BioWatch is an air-monitoring system that aims to provide early warnings of biothreats in urban areas. The initiative is led by DHS, in partnership with EPA and CDC's Laboratory Response Network. This biosurveillance system includes round-the-clock air-monitoring stations that have been operating in more than 30 cities across the nation since 2003.

Technicians collect air samples from BioWatch sensors. The samples are tested at designated state and local labs that are part of the Laboratory Response Network for the presence of specific bioagents, including anthrax, smallpox, and plague.

If lab workers detect a bioagent, the sample is sent to CDC for confirmation and a rapid response protocol goes into effect. This protocol involves state and local officials, DHS, CDC, EPA, and the Federal Bureau of Investigation. Though federal officials have not released the protocol to the public, they have indicated that CDC would notify the other agencies and the designated members of the Rapid Response Team would quickly make decisions and communicate a coordinated response and mitigation strategy (with recommended actions) to local health departments (Marburger, 2003).

If your community is affected by the deliberate release of radiological, nuclear, chemical, or biological agents into the air by terrorists, you will be coordinating your response with the IMAAC, EPA, CDC as well as other federal agencies and state and local officials.

ADDITIONAL INFORMATION

EPA Counter-Terrorism Topic Page: http://www.epa.gov/ebtpages/emercounter-terrorism.html

EPA Emergency Response Program: http://www.epa.gov/superfund/programs/index.htm

EPA Regional Offices: http://www.epa.gov/epahome/locate2.htm

CDC's National Center for Environmental Health: Emergency and Terrorism for Environmental Health Practitioners: http://www.cdc.gov/nceh/ehs/ETP/default.htm

CDC's National Institute of Occupational Safety and Health: Emergency Response Resources: http://www.cdc.gov/niosh/topics/emres/default.html

6. LEADING THROUGH COMMUNICATION: THE ROLE OF RISK COMMUNICATION DURING A TERRORIST ATTACK OR OTHER PUBLIC HEALTH EMERGENCY

SECTION HIGHLIGHTS

This section provides information on how public health officials develop messages and communicate with the public and the media during emergencies, such as terrorist attacks, natural disasters, and other public health emergencies.

Key elements of successful messages in a crisis are described, including:

- **Express empathy and humanity:** Let people know that you know how they are feeling. Let them know you "get it."
- **Clarify the facts:** Tell people what is known and what is not known. Helping people understand that not all the facts are clear (when they are not) at a certain time builds trust.
- **Explain steps being taken by officials:** Provide people with information on what you are doing to learn more facts, take care of people who are injured or sick, and prevent others from being affected.
- **Give a call to action:** Give people things to do. Having something to do helps channel distress and anxiety. Help people take appropriate actions that support the public response to the emergency by telling them what is most helpful for them to do and why.
- **Provide referrals:** Tell people where they can go for more information (e.g., toll-free numbers, Web sites, etc.).

Communication with the public is a critical part of the response to a crisis. In the immediate aftermath of an event, the public will look to public officials and first responders for leadership and answers. The affected public will always rely on local officials first. The quality, timeliness, and credibility of your messages and messengers may make the difference between people staying safe or becoming vulnerable to health risks presented by the emergency.

However, institutional pressures, deeply rooted processes, tremendous uncertainty about what is actually confirmed versus only suspected, and the enormous consequences of what you say and when you say it can get in the way of effective communication during an emergency. To make the challenge even greater, the public receives information and makes decisions about how they will respond differently during emergencies than during nonemergency times.

This section provides information on how public health officials develop messages and communicate with the public. It also offers tips for maximizing the effectiveness of your communication if you ever need to deliver public health messages. The section is based on our lessons learned from previous terrorist attacks, natural disasters, and other public health emergencies, communication research, and the insights of risk communication experts.

"This section conveys two critical points: (1) Risk communication is a fundamentally different approach from communication methods that are used in everyday efforts to inform the public and the news media; (2) If you resort to the standard communication methods during a disaster, your communication efforts will fail. Many have praised Rudolph Giuliani for his communications following the September 11 terrorist attacks, but few have followed his example in responding to local incidents involving community anxiety and outrage."

Ken August, Deputy Director of Public Affairs, California Department of Health Services; former president of the National Public Health Information Coalition (NPHIC)

COMMUNICATION CHALLENGES DURING PUBLIC HEALTH EMERGENCIES

Terrorist attacks and public health emergencies present unique situational characteristics and emotional and psychological dynamics in the general public that affect how we deliver information. Information can become as important as food, water, and shelter. Some of the most significant emotions expressed include:

- Fear and anxiety (e.g., "This is horrifying." "Where can we turn?" "What awful things are ahead?!" "What do I do now?")
- Anger (e.g., "How could they?!")
- Misery, depression, and empathy (e.g., "Poor victims")
- Hurtfulness (e.g., "Why do they hate us so?")
- Guilt (e.g., "How come I survived and they didn't?" "How dare I still care about day-to-day trivia?")

Compounding these emotions are the long time frames within which people may have to engage with crises, such as bioterrorism-based outbreaks or a pandemic. Many of these crises unfold over time and resolve slowly, causing long-term distress and a unique communication challenge. Some of these characteristics and their implications for communication are discussed on the following page.

Lives are at stake. As with many public health issues or natural disasters, information has the power to save lives—possibly many, many lives. People require information to find out what is actually happening and also what they must do to safeguard their own and their family's personal safety. But strong emotional responses to the event—fear, misery, concern, guilt, and anger—make understanding and acting upon that information more difficult.

There is great uncertainty. Almost every instance of terrorism would present a profoundly new and previously unknown set of circumstances—to officials working to manage the situation and to the public at large. Many pathogens considered to be potential weapons are almost never seen in the United States. Even though a lot is known about these agents and how they might present themselves, in reality not everything is known, as one would like it to be, in the event of a terrorist attack. (Such was the case when anthrax was distributed through the mail. Before that time, medical experts were not sure whether anthrax spores could be milled small enough to get through sealed envelopes or whether people could contract anthrax through the mail.) Individuals

and communities will be trying to cope with the situation and take necessary actions to protect their health and safety, while what is known and believed is unfolding with the constantly evolving story.

Individual and community levels of distress peak. Fear and uncertainty lead to unusually high levels of distress. While this distress may be unnerving to some leaders, and is certainly unpleasant for the public, it is appropriate in crisis situations. If properly guided, distress motivates precautions and saves lives. Because of the psychological impact of terrorism—and of many public health emergencies—it is not enough to give the facts of the situation and tell the public what to do and expect that people will actually take these protective actions. High distress levels can keep individuals and communities from engaging in protective behaviors. However, how officials communicate can actually help channel this distress into productive and protective behaviors instead of destructive ones. Distress, if not excessive, leads to information-seeking and precautionary behavior. But great distress or fear can also make it hard for people to process information. People can better bear their fear and make appropriate decisions about safeguarding their health and safety when their fears are acknowledged, as opposed to when they are told not to be fearful. Make it a goal to be respectful of the distress people are feeling.

WHAT ARE THE OBJECTIVES OF THE PUBLIC IN A HEALTH-RELATED EMERGENCY?

Most citizens share five main objectives during public health emergencies, including those caused by acts of terrorism:

- Protect themselves and their loved ones (e.g., children, elderly relatives, pets)
- Get the facts they want and need to protect themselves
- Be able to make choices and take action
- Be involved in the response (e.g., helping victims)
- Stabilize and normalize their lives

HOW PEOPLE FEEL CAN AFFECT THEIR ABILITY TO MEET THOSE OBJECTIVES.

There are many ways people's feelings can affect their responses. Some examples include:

- **Fear.** Fear is one of the single most powerful emotions present during a terrorism emergency. It has the capacity to propel community members to action. Interestingly, in the aftermath of past emergencies, experts noted that people seldom panic (let their fear overwhelm them). People act. Whether that action is helpful or harmful to the community depends on whether the individual can hear, understand, and act on sound guidance from public health authorities. Public health officials have the capacity to help individuals channel their fear and distress into protective actions, rather than irrational behaviors. Effective communication can help people take the most appropriate actions to support the public health response. It is important to erase the word panic from your crisis vocabulary.

- **Denial.** No doubt some members of the community will be in denial. They may choose not to hear or heed warnings or recommended actions. They may become confused by the recommendations or simply not believe that the threat is real or that it is an actual, personal threat. In such cases, people will not act on even the best advice. Denial, in fact, is one of the reasons why panic is rarer than we realize. People go into denial as a coping mechanism when the fear is too great. But there are several important antidotes to denial. The two key ones are: (1) the legitimization of fear—people who feel entitled to be afraid do not have to go into denial; and (2) action—people with something to do have more capacity to tolerate their fear and, therefore, are less vulnerable to denial.

- **Hopelessness, helplessness.** Some people can accept that the threat is real, but it looms so large that they believe the situation is hopeless and so they feel helpless to protect themselves. The resulting withdrawal and inaction can impair their ability to take appropriate protective action in a public health emergency. People who feel powerless to affect the outcome are more likely to retreat into denial and the resulting hopelessness and helplessness that lead to inaction. Therefore, helping people to find ways to affect or change their situation is important. Hopelessness, helplessness, and denial are all reduced by messages of empowerment (not "everything will be fine," but "it's a bad situation, but there are things you can do to make it better, such as...").

- **Stigmatization.** Some members of the community may suffer even greater effects from the attack if the rest of the community stigmatizes them. Fear or isolation of a group may occur if the community perceives it as contaminated or "risky." For example, in some cities, residents avoided Chinatowns and Chinese restaurants out of fear of exposure to SARS. This type of stigmatization can hamper community recovery and affect evacuation, relocation, or when necessary, quarantine efforts. In addition, groups people perceive as related to those who are "to blame," such as Arab-American communities following September 11, can become targets of local violence, even though they are as much victims of the terrorist attack as their neighbors.

- **Vicarious rehearsal.** Interestingly, experience has shown that people farther away (by distance or relationship) may react as strongly as those who are more directly affected. Today's communication environment allows people to participate vicariously in a crisis in which they are not in immediate danger. This psychologically normal response to new risky situations results in people mentally rehearsing the crisis as if they were experiencing it and asking themselves, "What would I do?" In their minds, they imagine that the risk is here (instead of there), now (instead of soon), and definite (instead of maybe). They may believe that they, too, are at immediate risk and demand unnecessary services; as a result, they may go to the emergency room or take medications they do not need. Their stress reactions will be high, even though they are not in immediate danger, often resulting in some of the health consequences of stress. Further, because many of the agents are invisible and difficult to detect, we may not always be able to tell a community with certainty that it has not been exposed. This imaginative leap from there/soon/maybe to here/now/definitely can be beneficial if it is acknowledged and the opportunity is taken to prepare, emotionally and logistically, for a real crisis.

WHAT DOES THIS MEAN FOR COMMUNICATION WITH THE MEDIA AND THE PUBLIC?

In times of emergency, officials will be working hard to deliver the information that answers questions people will ask, such as:

- "What happened?"
- "Am I safe?"
- "Is my family safe?"
- "Who's in charge?"
- "What is being done to protect me, my family, and my community?"
- "What can I do to protect myself?"
- "Why did this happen?"
- "When will it be over?"

However, some things that people need to know are not easy for them to hear: that people are dying, that the risks are not really understood, that it is not known when the emergency will be over, and that decisions may have to be made with imperfect information. Most importantly, people need to know what to do to protect themselves and their families. Sometimes this is easy to hear and easy to act on. But there are times when public health guidelines are not consistent with personal beliefs or instincts. These are times when delivering guidance takes more than printing words on a page or reporting to the viewing and listening audiences what they need to do. It takes more because the public will need to be led toward protective actions.

"During a crisis, leaders may need the public to follow 'negative' instructions, such as 'don't go to the hospital unless...' or 'don't try to pick up your kids at school.' These negative instructions many times go against one's own instincts and therefore require very high levels of trust. Good communication may help build this trust, though frankly, it really needs to be built beforehand. In any case, poor communication will surely undermine any trust that existed beforehand or could have potentially been built during a time of crisis.

The use of proper risk communication principles is vital to the response to a crisis. People WILL exercise initiative whether leaders want them to or not. They will figure out how best to protect themselves and their families, and they will reach out to try to help others.
In order to determine what to do, they will search diligently for information and guidance. If what is available from official sources is scanty or vague, lacks credibility, or provides no real role for them, they will simply turn to unofficial sources to fill the void. Finally, leaders must remember that people can help. Leaders may need not just their compliance but their initiative and even their guidance. Good crisis communication is two-way."

Dr. Peter Sandman, Risk Communication Expert

EXAMPLE OF HOW APPROPRIATE PUBLIC HEALTH GUIDANCE MAY CONFLICT WITH PEOPLE'S INCLINATIONS

If a community is exposed to the smallpox virus, public health guidance will likely include recommending that people not leave the region. A common response might be: "Not leave the region? But why not? I want to take my children to my mother's house in the next state, where they will be safe." However, if a vaccination program starts, the vaccine will be available in the affected region and possibly not near Grandma's house. Similarly, if a radiological or chemical event occurs, public health officials may recommend that parents do not attempt to pick their children up from school. In most cases, emergency plans provide for quicker and surer evacuation of schools than the rest of the population. Therefore, while the inclination of parents to do so will surely be high, removing children from school in a crisis may be moving them from a more protected to a less protected category.

These examples show how public health guidance can conflict with personal inclinations. This conflict can make it difficult for the public to act on such guidance.

Table 6–1 lists the types of critically important information that public health officials strive to deliver to the media and the public during public health emergencies.

TABLE 6–1. INFORMATION THAT PUBLIC HEALTH OFFICIALS MAY PROVIDE IN A PUBLIC HEALTH EMERGENCY

WHAT	WHY	EXAMPLE
Expression of empathy and acknowledgment of fear and uncertainty	Government officials have historically tended to speak about facts, rather than emotions. Therefore, expressing empathy, fear, or uncertainty can be particularly difficult for officials to do. Experts believe that citizens need to know that their feelings are understood and acknowledged by authorities. This helps establish a connection and makes it a little easier for audiences to hear the difficult information that usually follows.	"Whatever it [the loss of lives] is, it will be more than we can bear..." *—Rudolph Giuliani,* September 11, 2001
Clarification of facts	Public health officials will try to provide as much factual information as they can about the situation.	"At ___ *time* today, ___ *number of individuals* in the ___ *location* reported to ___ *hospital* with ___ *symptoms*..."

WHAT	WHY	EXAMPLE
What is not known	Just as expressions of empathy do not always come naturally, discussing the unknown elements of the situation also goes against years of professional training and experience. Many public health officials are used to having confirmation of all of the facts before releasing information. Just as important as what is known is what is not known. There will be many things public health officials do not know, especially when they suspect an illness but have not yet confirmed it. It is also likely that, in the initial stages of the investigation, they will not know the route of exposure or what/who caused the situation. The nature of terrorism is pushing public health officials to change the way they release information to the public. They realize that waiting until they have an answer to every possible question could jeopardize public safety. As their understanding of the situation evolves, they will provide you with updates on what is known and what is not known.	"We will learn things in the coming weeks that we will then wish we had known when we started." *—Jeff Koplan,* former director of the Centers for Disease Control and Prevention, talking about anthrax in 2001
Steps taken to get more facts	Although there is much they may not know, public health officials can tell you the immediate steps taken to get more facts and to begin to manage the public health emergency. Immediate steps might include isolating patients, conducting an epidemiological investigation, alerting the public to signs and symptoms, activating the Health Alert Network, etc. The public can more easily accept high levels of uncertainty when they are aware of the actions taken to find answers.	"We do not know yet how many people have been exposed to the ___ *source of illness*, but we are talking to everyone who was in ___ *location* on ___ *date*. If you were in ___ *location* on ___ date, please call 1-800- ___ - ___ ."
Call to action—giving people things to do	In a crisis where immediate action needs to be taken (e.g., sheltering-in-place due to a radiological incident), this may be a key part of the message. In some cases, even symbolic actions can help channel people's energy and desire to do something.	**Protective actions:** Boil water before drinking, or drink bottled water. **Helpful actions:** Donate time or money to a charity providing assistance; check on elderly neighbors. **Symbolic actions:** Attend a vigil or fly the American flag.
Referrals	Public health officials will tell you when the next update will occur and where you and the public can go for more information, help, or support, such as hot lines or Web sites with more detailed information.	"We expect to get ___ *information* confirmed within the next ___ *timeframe* and will let you know what we are dealing with at that time..."

CRISIS COMMUNICATION LESSONS LEARNED FROM PUBLIC HEALTH EMERGENCIES

Anyone who has been involved with public communication during a crisis knows firsthand that there are many challenges to getting the message out quickly. Here are some tips from risk communications experts for addressing some of the commonly faced obstacles encountered in public health emergencies:

What do you say when your team's experts do not agree? There are likely to be many times during the crisis when experts do not agree with each other. Basic communications training teaches us that consistent messages are critical, but that does not mean keeping everyone in a room until they agree on technical issues—and waiting to act and release information until they agree. Rather than letting disagreements stymie attempts to keep the public informed, risk communications experts suggest:

- Reveal uncertainties, unknowns, and disagreements.
- Avoid overconfidence and explain that as new knowledge about the event surfaces, it may result in changes in public recommendations and actions to contain the situation (use a confident tone, but be tentative in your content).
- Share dilemmas in decision-making.

Paradoxically, this approach builds trust in leadership and protects your credibility in the long run.

What does this sound like? *"There are several possible explanations for what we're seeing today. One is ___, another is ___, and still a third is ___. With the limited confirmed facts we have right now, it is not possible to know for sure which is most correct. Each of these scenarios would suggest slightly different options for how to best minimize the impact to our local residents. We can either wait for the confirmation before acting or make an educated best guess and move forward, taking steps to protect ourselves the best we can. Therefore, we are doing ___ to protect people from harm, and we will adjust our approach if we need to when more facts are known."*

In this example, the various perspectives are revealed without sounding like experts are disagreeing with each other. Because the decision-making dilemmas are shared with the public, you have engaged them in the process. When new facts are revealed during the investigation that may contradict what was thought earlier, people will not question your capabilities or judgment.

What do you say when confirmation tests are not finished yet? It may take days to have complete confirmation of a biological or chemical agent. In the time between something happening and revealing itself to the public (people are sick, for example) and the moment you have confirmation of what is really happening, you cannot afford to remain silent and not take action. Rumor, speculation, and the presence of presumed experts will affect people's reactions. Risk communication experts suggest:

- Address the fact that something is suspected, but not confirmed.

- Be willing to speculate, within limits. But if you have no idea, don't guess. Allow someone who has technical expertise in the area to provide informed speculation, and, most importantly, be sure your audience knows that you are sharing your hypothesis, which may or may not prove to be correct once the test results are in.
- Share what is known, what is not known, and what is being done in the meantime.

What does this sound like? *"In the last ___ hours, several patients have come to area hospitals with symptoms of ___, ___, and ___. Public health officials suspect that these individuals may have ___ due to the nature of their symptoms. It is important to know that we do not have confirmation of this diagnosis, and it will take another ___ hours until the test results come in. In the meantime, these patients are in stable condition and the best available medical care is being provided for them. In addition, public health officials are working with them to identify their family members and close contacts so they can receive the medical care they might need. It is entirely possible that this will be a false alarm, but we will proceed with an abundance of caution until we know one way or the other.*

Where they might have come into contact with the ___ illness is the most important question officials are trying to answer right now so that others who may have been exposed can be identified and treated."

How do you best use your technical resources? How do you best collaborate with subject matter and technical experts at press conferences? Remember to keep your experts nearby, especially when talking with the media. Allow first responders to address safety issues, public health officials to address health questions, and elected and appointed officials to provide leadership to the team and community.

How do you balance timeliness and accuracy? Your message will be judged on both its timeliness and its accuracy. It is a juggling act to make sure that one is not sacrificed for the other. How do you ensure that, by disseminating information quickly, you do not get the message wrong? On the other hand, if you wait until all of the facts are clear and confirmed, you have sacrificed getting information out there quickly. It feels like a no-win situation.

According to risk communication experts, immediate communication with the public is critical to the success of your message and your credibility throughout the duration of the emergency. You cannot wait until you know all of the facts. The same risk communication recommendations apply:

- Be first to respond to the public's need for information.
- Share what is known, what is not known, and what next steps are being taken by officials.
- It is preferable to tell the public that you do not know all the answers yet than to tell them nothing.
- Resist the temptation to reassure the public excessively.

THE NATURE OF CRISIS NEWS: WHEN A LOCAL STORY BECOMES NATIONAL, THEN 24/7

You may have participated in hundreds of press conferences, news briefings, or media interviews. But the media attention given to a national emergency, such as a terrorist attack, may be unlike the coverage of local emergencies you have encountered.

HOW IS IT DIFFERENT?

- National news teams and their equipment will require space near the site of the emergency. Do you have a staging area?
- There will be many new contacts to deal with, in addition to your local news contacts. Do you have national and local media lists?
- Requirements for timely release of information will increase. Are you ready to meet the demand with regular updates and maintain that schedule even if there is no new information to provide? Does your Public Information Officer (PIO) have a contingency plan for prolonged 24/7 operations (e.g., assigning additional PIOs from other parts of your government to assist with the response)?
- The number of reporters seeking nuggets of news, or scoops, is increased. Be prepared for lots of news angles to be pursued and lots of local and national experts and so-called experts to be interviewed.
- Do you know who your local experts are and who would do the best job at a briefing or interview?
- The depth of story coverage is increased. Live news coverage increases. When the story becomes an all-day television event, be prepared for every nuance to be told. Know that news crawlers at the bottom of TV screens are becoming a popular and powerful tool. Have your crawler messages ready! See the box on the next page on the "Language of Live" for a description of 24/7 news coverage.

NEWSROOMS DURING CRISIS

- The first available reporter might get the story—which may not necessarily be his or her "beat." Seasoned or informed reporters will arrive later. Even then, reporters are not subject matter experts, and they will need background information to help them tell the story. A helpful source of information is the U.S. Department of Health and Human Services' "Terrorism and Other Public Health Emergencies: A Reference Guide for Media." This guide can be accessed or ordered at http://www.hhs.gov/emergency.
- The first information out is reported first. Facts are sorted out as the story evolves. If you use the "language of live," your statements can adapt to the evolving situation.
- The media will not wait for you. They will start reporting on the story whether you are talking to them or not. Get into the news cycle as soon as possible—that is better than correcting inaccurate information later.

- Reporters are experiencing the crisis just as you are—in real time. Pressures and emotions will be managed as much as possible, but people are only human.
- Many reporters and news organizations will work closely with you in the early stages of a crisis, but this won't last forever. As the immediate emergency fades, you must be prepared for a more "traditional" relationship.

THE NATURE OF 24/7 NEWS COVERAGE AND THE NEW "LANGUAGE OF LIVE"

"In this environment, events and information play out in real-time; live; 24/7; nonstop. As a result, we get news by increment. Each little development becomes the latest 'breaking news' piece set into the mosaic of the larger story. This can be helpful or it can be a terrible distraction. One of the challenges for news organizations is to make sure incremental news is proportional and provides context.

"The advent of incremental news brings with it the danger of 'information lag.' That is the time between when the media asks a question and a responsible official can answer it. That time lag can be minutes or it can be hours. In some cases—such as with certain types of bioterrorism—it may even be days. This truly is the most precarious time in the story process, when uninformed speculation and rumor can fill the information void. This can be a very dangerous thing. We saw this play out during the anthrax attacks of 2001. It is why news organizations and public officials alike need to learn and appreciate what I call the 'language of live.' The 'language of live' recognizes the realities of the 24/7 world. It is a transparent language that is deliberate and clear. It explicitly states what is and what is not known, confirmed or corroborated. It directly attributes sources of information. It labels speculation as such. It quickly doubles back on bad information to correct the record. The 'language of live' is a language that many journalists employed fluently in the days after 9/11...

"There are some things the 'language of live' should not be—especially when we're talking about the coverage of terrorism. It should not be breathless. It should not be hyped. It does not need to be accompanied by sensational graphics or ominous music. The facts will be ominous enough."

Frank Sesno, University Professor of Public Policy and Communication, George Mason University; former Washington, DC, bureau chief, CNN

Testimony before the House Select Committee on Homeland Security, September 2004

7. LEGAL AND POLICY CONSIDERATIONS

SECTION HIGHLIGHTS

This section describes some of the important legal issues that need to be considered when responding to a severe public health emergency, or when updating local and state public health laws.

- Public health laws vary by state and region.
- Public health laws are currently being updated in many states because they may be outdated, unconstitutional, and/or too specific to provide officials with the powers they need to protect the public during a public health emergency.
- Some of the legal issues surrounding public health emergencies include privacy and due process protection; clarity of jurisdiction; and liability and compensation for those harmed.
- Federal, tribal, state, and—in some cases—local governments have some legal authority to issue isolation and quarantine orders.
- Several resources, such as the Model State Emergency Health Powers Act and the Uniform Emergency Volunteer Health Practitioners Act, are available to guide officials through the process of updating laws. Links to resources are provided.

PUBLIC HEALTH LAWS

Legal preparedness is an important part of comprehensive preparedness for bioterrorism and public health emergencies. The attacks of September 11 and the anthrax mail scare served as a wake-up call to federal, tribal, state, and local governments for the need to review and modernize their public health laws. Many laws relating to quarantine authority, compelled vaccinations, and the commandeering of property have not changed since the early and middle decades of the 20th century (http://www.nga.org/cda/files/0405BIOTERRORISMLAWS.pdf). Currently, public health laws may be:

- **Outdated:** They do not provide adequate powers because they do not reflect modern diseases (e.g., the state of New York had to call an emergency session to change existing laws to address SARS after its emergence within the state).
- **Unconstitutional:** While some laws may be sufficiently broad to be applied to modern health threats, they may be deemed unconstitutional because they violate privacy rights, fair hearing rights, and other rights.
- **Unclear:** Individual laws are often passed on an as-needed basis (such as the New York SARS example above); when reviewed comprehensively, they may be confusing and unclear. Specifically, public health laws are often unclear as to jurisdictional authority across local, state, tribal, and federal governments.

LEGAL QUESTIONS THAT MAY ARISE DURING A PUBLIC HEALTH EMERGENCY

Many legal questions may be asked during a response to a severe public health emergency, which need to be considered when reviewing or updating local and state public health laws. These questions include:

- Who can declare a public health emergency?
- Can we investigate contacts?
- Can we examine and test people?
- Can we share information? With whom? How much information can be shared? Can we decline to share information?
- Can we treat and vaccinate?
- What are the legal issues related to triage and allocation of scarce medications, supplies, and services?
- How do we respond to people who decline treatment?
- Can we isolate and quarantine? (See below for more information on this topic.)
- Can we obtain facilities and supplies? From whom?
- How do we address any liability issues related to using nongovernmental personnel or volunteers? How about health care professionals from other states?
- In what situations are we liable?
- Can the scope of practice for health care providers be expanded?
- Do we have the legal structure to support emergency triage and resource allocation strategies?

(Adapted from Sapsin, J.W. & Teret, S.P. (2002). The Center for Law and The Public's Health at Georgetown & Johns Hopkins Universities. Introduction to public health law for bioterrorism preparedness and response. http://www.publichealthlaw.net/Training/TrainingPDFs/Center%20BT%20Module.ppt)

HIPAA PRIVACY RULE

The Health Insurance Portability and Accountability Act (HIPAA) Privacy Rule recognizes that various agencies and public officials will need protected health information to deal effectively with a bioterrorism threat or other public health emergency. To facilitate the communications that are essential to a quick and effective response to such events, the Privacy Rule permits covered entities to disclose needed information to public officials in a variety of ways. Covered entities include health plans, health care clearinghouses (e.g., billing services), and health care providers who transmit health information in electronic form in connection with certain transactions (http://www.cdc.gov/mmwr/preview/mmwrhtml/m2e411a1.htm). For applications of the Privacy Rule during bioterrorism and other emergencies, see answers 397 and 960 on Health Information Privacy and Civil Rights Questions & Answers found at http://www.hhs.gov/faq/. For more information on the Privacy Rule and public health, see http://www.cdc.gov/mmwr/preview/mmwrhtml/m2e411a1.htm.

LEGAL AUTHORITY RELATED TO ISOLATION AND QUARANTINE

Federal, tribal, state, and—in some cases—local governments have the legal authority to issue orders for isolation and quarantine. Generally, state and local jurisdictions have primary responsibility for isolation and quarantine within their borders. For instance, if an outbreak were to occur within a specific locality, local officials may assume primary responsibility for exercising their quarantine authorities. If an outbreak affects more than one community, there are no relevant local ordinances, or the local outbreak has the potential to spread into other communities, states may take primary responsibility, in conjunction with local authorities. Similarly, if state and local jurisdictions are unable to adequately respond to an outbreak, or if an outbreak becomes widespread, the federal government may exercise its authorities. Because these authorities generally exist at all levels of government, who actually implements the authorities may depend upon a number of factors, including prior planning, resources, and capabilities.

The federal government is primarily responsible for preventing diseases from being introduced and spread in the United States from foreign countries as well as interstate and national outbreaks. The Division of Global Migration and Quarantine at the Centers for Disease Control and Prevention (http://www.cdc.gov/ncidod/dq/mission.htm) enforces regulations that are intended to prevent the introduction, transmission, and/or spread of communicable diseases from foreign countries into the United States. During the SARS outbreak in 2003, federal quarantine officers took a number of actions to protect the health of the public, ranging from distributing health notices to air travelers with information about SARS to boarding planes to see if ill travelers had symptoms of the disease.

DISTINCTION BETWEEN ISOLATION AND QUARANTINE

Isolation removes people who are ill with contagious diseases from the general public and restricts their activities to stop the spread of a disease.

Quarantine separates people who have been potentially exposed and may be infected but are not yet ill to stop the spread of that disease.

FOR FIRST RESPONDERS

First responders may be curious to know whether liability issues are different during severe public health emergencies. If responders do not exceed the scope of practice as defined by the county or agency medical director and do not perform in a grossly negligent or reckless manner, they may, depending on applicable law, be protected from liability. Volunteer first responders are also generally protected from liability in many situations. It is important to note, however, that during a severe public health emergency first responders may be called on to serve other roles than they typically perform, such as enforcing quarantine orders. It is, therefore, advisable for volunteer first responders to research and become familiar with the applicable laws and regulations in their respective states.

For more specifics on these issues and the answers to some common questions, see pp. 7–14 of the "Civil Legal Liability and Public Health Emergencies" checklist found at http://www.publichealthlaw.net/Resources/ResourcesPDFs/Checklist%203.pdf.

RESOURCES FOR UPDATING PUBLIC HEALTH LAWS

To assess legal preparedness, state health departments have made extensive use of the Model State Emergency Health Powers Act (MSEHPA). Developed by the Center for Law and the Public's Health at Georgetown and Johns Hopkins Universities, MSEHPA grants public health powers to state and local public health authorities to ensure a strong, effective, and timely planning, prevention, and response mechanism to public health emergencies (including bioterrorism) while also respecting individual rights. MSEHPA has been used by state and local lawmakers and health officials nationwide as a guide for considering public health law reform in their states. As of July 15, 2006, The Center for Law and the Public's Health reports that the Act has been introduced in whole or part through bills or resolutions in 44 states and the District of Columbia. Thirty-eight states and the District of Columbia have passed bills or resolutions that include provisions from or closely related to the Act. The extent to which the Act's provisions were incorporated into each state's laws varies. For more information, please refer to the specific legislative bills or resolutions referenced in the State Legislative Activity Table (http://www.publichealthlaw.net/MSEHPA/MSEHPA%20Leg%20Activity.pdf) and the MSEHPA Legislative Surveillance Table (http://www.publichealthlaw.net/MSEHPA/MSEHPA%20Surveillance.pdf).

The National Conference of Commissioners of Uniform State Laws has drafted a model act called the Uniform Emergency Volunteer Health Practitioners Act (UEVHPA), which if enacted by states, should assist states in the use and exchange of volunteer health professionals during an emergency. This act, which was finalized in 2006, was developed in response to problems

related to a lack of uniformity in state laws that became evident during the hurricane season of 2005. Health professionals from outside the affected Gulf Coast states who volunteered to provide assistance to disaster victims were delayed, and in some cases prevented, from providing services because they were unable to quickly and clearly obtain authorization to practice within the affected states. UEVHPA establishes a system whereby health professionals may register either in advance of or during an emergency to provide volunteer services in an enacting state through various registration systems. The entire act, as well as additional information including related legislative activity, can be found on the Act's Web site at http://www.uevhpa.org.

Together with the Centers for Disease Control and Prevention's Public Health Law Program, the Association of State and Territorial Health Officials, and the National Association of County and City Health Officials, the Center for Law and the Public's Health prepared Checklists on Legal Preparedness for Public Health Emergencies that public health agencies can use, at their own initiative, to assess the following three important components of their legal preparedness:

- Interjurisdictional legal coordination for public health emergency preparedness
- Local public health emergency legal preparedness and response
- Civil legal liability related to public health emergencies

These checklists are available at http://www.publichealthlaw.net/Resources/BTlaw.htm.

Another resource is the Turning Point Model State Public Health Act, developed by the Turning Point Public Health Statute Modernization Collaborative. This is a tool for state, local, and tribal governments to use in revising or updating public health statutes and administrative rules. Funded by the Robert Wood Johnson Foundation as part of its Turning Point Initiative to strengthen the public health system in the United States, the Collaborative is a multidisciplinary group composed of representatives from five states and nine national organizations and government agencies, assisted by experts in specialty areas of public health. More information on the Collaborative can be found at http://turningpointprogram.org/Pages/ph_stat_mod.html.

Other tools and resources for updating and understanding public health laws include:

- The Center for Law and the Public's Health at Georgetown and Johns Hopkins Universities. http://www.publichealthlaw.net.
- The Center for Law and the Public's Health at Georgetown and Johns Hopkins Universities. Center's short course: Introduction to public health law for bioterrorism preparedness and response. http://www.publichealthlaw.net/Training/Sources.htm.
- Centers for Disease Control and Prevention. Public health law program. http://www2a.cdc.gov/phlp/.
- Centers for Disease Control and Prevention. (2004). Fact sheet—Legal authorities for isolation and quarantine. http://www.cdc.gov/ncidod/dq/sars_facts/factsheetlegal.pdf.
- National Conference of State Legislatures. (2002). The Model State Emergency Health Powers Act: A checklist of issues. http://www.ncsl.org/programs/health/modelact.pdf.

- National Conference of State Legislatures. (2002) Public health: A legislator's guide. http://www.ncsl.org/programs/health/publichealth.htm.
- National Governors Association. Issue brief—Bioterrorism and state public health laws: New challenges. http://www.nga.org/cda/files/0405BIOTERRORISMLAWS.pdf.
- U.S. Department of Health and Human Services. Public Health Guidance on Pandemic Influenza for State and Local Partners. Appendix 1. Checklist of Legal Considerations for Pandemic Influenza in Your Community. http://www.hhs.gov/pandemicflu/plan/part2.html#apd1.

Please note that this section provides only a brief and limited review of the legal issues related to terrorism and other public health emergencies. More detailed information can be found through the resources listed in this section and your other local or state legal resources.

8. TAKING CARE OF YOURSELF AND EACH OTHER

SECTION HIGHLIGHTS

This section provides tips for the physical and emotional care of leaders and responders before, during, and after an emergency.

- Leaders should provide long-term, continuous team support for their teams, because response may take days, weeks, or even months.
- Make sure to consider self-care before the emergency happens, including:
  - Making arrangements for personal responsibilities
  - Assembling a disaster supplies kit for home and workplace
  - Creating a self-care plan
- Staying in touch with colleagues, friends, and loved ones during an emergency may help leaders and responders to stay focused on their jobs.
- It is important for leaders and responders to consider their own emotional care, both for their own well-being and to help them perform their jobs better.
- Managers can support their teams during a response by enforcing shifts, encouraging team members to limit excessive caffeine and junk food consumption, and using other strategies.

THE IMPORTANCE AND CHALLENGE OF SAFETY AND COPING

First responders and public officials deal with emergencies in their communities every day—from weather-related incidents to fires. However, relatively few have worked in an environment devastated by a terrorist attack or a profound public health emergency. During the response to such events, both first responders and public officials have the common goal of protecting their communities. The response to such events may take days, weeks, or even months and will prove to be a stressful experience for even the most seasoned professionals. Leaders must create a response plan that provides for continuous support for their teams—and that requires attention to the physical and emotional well-being of the response teams.

WHY DO MAJOR DISASTERS MAKE THE WORK OF RESPONDERS MORE HAZARDOUS?

"Most emergencies are on a comparatively small scale. One or more specialized local response organizations can handle them effectively. In these situations, steps to ensure responder safety are usually well established and familiar. But the singular nature of a major disaster presents special challenges to safety management. For example, unlike smaller emergencies, a major disaster can cover a wide geographic area, present many highly varied hazards, and take from several days to several months to contain. In short, not only does a major disaster expose emergency workers to a multitude of risks they would not normally face, it requires a complex response operation that can involve many different organizations. In such situations, it is crucial to have effective systems in place for managing the safety of the numerous responders on the scene."

Source: RAND Corporation. (2004). Safeguarding emergency responders during major disasters and terrorist attacks: The need for an integrated approach. http://www.rand.org/pubs/research_briefs/RB9044/index1.html. Reprinted with permission.

Many issues may complicate your response to such events, including:

- Physical and mental trauma or "burnout" that can occur with the extended response that may be needed during a public health emergency.
- Potential exposure to pathogens, poisons, and other health threats, and the fear of bringing illness to your family.
- The challenge of responding to an event when you, your staff, and your loved ones may be part of the "affected public."
- Individual distress responses that may manifest as irritability, depression, anxiety, or other posttraumatic stress symptoms.
- The challenge of dealing with an invisible threat, like an infectious disease, as opposed to crime, fire, floods, explosions, and other threats that are clearly visible.
- Latency effects may be serious (e.g., you may develop a disease even after you're "out" of the dangerous situation).

> The first thing that happens during disaster response is that caffeine intake goes up and sleep and rest go down. This is not a good recipe for long-term response.
>
> *David Kaye, NREMT–P, International Association of EMTs and Paramedics*

The large scale of a public health emergency almost certainly means there is a limitless amount of work to do, and you and your staff may feel the need to push yourself beyond your usual limits. It can be difficult to go home or take a break when you know that your community is at risk. But it is important for you to monitor your needs and well-being as well as those of your staff so you will be able to stay focused and maintain the long-term response that will be needed.

SELF-CARE BEFORE THE EMERGENCY

When an emergency occurs, public officials and first responders are likely to be called on to fill any number of roles and may need to work extended hours for several days, weeks, or months at a time. During this time, it is both natural and healthy to be concerned about personal issues, such as the safety and well-being of loved ones. Without that assurance, it can be difficult to focus on work. To adjust to working in a disaster setting, you can encourage your staff (and yourself) to take the following steps in advance of an emergency:

Make arrangements for personal responsibilities.

- Consider the personal demands that may compete for your attention during a disaster, including children, elderly parents, and financial responsibilities.

IMPORTANCE OF PLANNING AHEAD

In a study on the community reactions to bioterrorism, findings indicated that 26 percent of first responders and 53 percent of their spouses thought that it was essential to reach agreement with their partners on whether to stay at work, seek medicines, and send family members out of town. Encouraging your staff to discuss these issues before an emergency may influence staffing levels and responder job performance in an actual event.

Source: DiGiovanni et al. (2003). Community reaction to bioterrorism: Prospective study of simulated outbreak. Emerging Infectious Diseases, 9(6), 708–712.

Assemble a disaster supplies kit for your home and workplace.

- Prepare a disaster supply kit for your family in case they are required to evacuate or shelter in place while you are at work.
- Assemble a similar kit for taking care of responsibilities from an office location.
- Consider preparing the kit in an easy-to-carry container, such as a duffel bag or small plastic trash can.
- More information on home and office disaster supplies can be found in appendix F (see p. 151). Additional supplies checklists can be found at http://www.ready.gov.

Create a self-care plan.

- Consider how you will take care of personal stress and well-being while doing disaster work.
- Include mental health in preparedness and response planning and cultivate an open and supportive culture.

TIP—PROTECTING IMPORTANT DOCUMENTS

Keep these records in a waterproof, portable container:

- Will, insurance policies, contracts, deeds, stocks and bonds
- Passports, social security cards, immunization records
- Bank account numbers
- Credit card account numbers and companies
- Lists of family members' blood types, medical conditions, and allergies

Note: You may also want to keep copies of these documents in a safe location outside of your home or workplace.

NEW APPROACH TO STRESS

"Traditionally, fire departments have taken a responsive approach rather than a management approach to stress. Often, we're slow to respond until something goes wrong. We send a firefighter to addictions treatment for a drinking problem, or we mandate employee counseling sessions when behavior is problematic. As a result of this strategy, firefighters are forced to resolve their problems in a time of stress while at odds with their employer.

"Instead, a management/prevention approach to stress could better serve the firefighter. The events of September 11 signaled a need to end the reactive approach. Fire service managers no longer have the luxury of waiting for a problem to occur before responding….Firefighters who respond to critical incidents in a lower state of stress have a greater chance of sustaining psychological wellness and avoiding burnout during their career."

Robert L. Smith, Lieutenant, Stress Management Unit, Washington Township Fire Department, Indianapolis, Indiana

Source: Smith, R. (2001). Stress management for firefighters. In R. Kemp (Ed.), Homeland security: Best practices for local government. Washington, DC: International City/County Management Association. Reprinted with permission.

SELF-CARE DURING THE EMERGENCY

PHYSICAL CARE

In the unfamiliar and chaotic environment of a disaster, it may be difficult to follow normal safety procedures. Proper training and preparedness can help with this situation, but how an event unfolds is largely out of the control of responders. While decisions regarding physical safety during an emergency need to be made individually by each organization, it may be helpful to consider the following tips for protection.

Staying In Touch

Stay in touch with colleagues.

- Provide several people, both in the field and back at the office, with a list of emergency contacts for you and detailed instructions on how to get in touch with them.
- Consider making communications arrangements for personal security, such as letting colleagues know arrival and departure times and checking in with a designated contact on a regular, predefined basis.

Stay in touch with friends and loved ones.

- An e-mail or quick phone call can make a big difference for you and your family. Let them know that you are OK and find out if they are OK. According to Sunny Mindel, former press secretary for New York Mayor Rudolph Giuliani, many first responders felt more focused on their work during the response to September 11 after having checked in with loved ones and letting them know that they were OK. A handheld wireless device was passed around the room so staff could send e-mail messages home.

TIP—MONITORING SUBSTANCE USE

It is not uncommon for people who typically use alcohol or drugs to increase their use during stressful situations. It is also common for people who are in recovery to start using substances again. People should be cautious of changes in their alcohol and drug use, because use of these substances may impair their ability to work, as well as their judgment, in potentially hazardous environments. These changes in substance use may be an indication of a need for more support. They are usually temporary; however, if increased use continues, the individual may want to consider seeking professional help.

"If someone has to work for 36–48 hours straight and they can't contact their family, we have an unpublished phone number that the family can call to get information. We believe that we must take care of our own, if we expect them to take care of others. If we have a cop out there worrying about his family, he's not going to be doing his job, so we have to make sure that this is taken care of."

Wayne Shelor, Public Information Officer, Clearwater Police Department (Florida)

DO I NEED PERSONAL PROTECTIVE EQUIPMENT?

The nature of emergency responders' work makes it impossible to completely eliminate all danger. In working on the scene of a terrorist attack or other public health emergency, responders may need to use protective equipment that is different from the equipment they use on a daily basis. Decisions about what type of equipment to use will differ based on the type of responder organization and the specific threats in each local jurisdiction.

Even public officials who do not anticipate being on the front lines of an emergency may have questions about the use of such equipment. There is no easy answer about what type of equipment may be right for you, your organization, or other responders in your community. However, for some general guidance on this topic, please visit the National Institute of Occupational Safety and Health's Web site on personal protective equipment at http://www.cdc.gov/niosh/topics/emres/ppe.html.

EMOTIONAL CARE

Taking emotional care of yourself is particularly important in a public health emergency, because you may also be a survivor of the emergency. Even if you did not experience the same kind or degree of trauma as those to whom you are providing help, you may still be coping with the event. Few people who respond to a mass casualty event remain untouched by it. You or your staff may experience anxiety, sadness, grief, or anger—but postpone rest and recovery while responding to the emergency. This can work up to a point, but such strategies have their limits, and experts recommend that you develop other psychological coping strategies, such as those described in the following sections, both for self-care and possibly in support of colleagues. By taking care of yourself and ensuring that your staff is doing the same, you will be better able to do your job and, for that matter, to return to "normal" personal functioning after the event. Remember that it is important for employers to destigmatize the act of seeking mental health support so that everyone can feel comfortable accessing these services. (See "Ways That Managers Can Help Response Team Members Reduce Stress Levels" on p. 73.)

"Firefighters are trained and socialized to respond to the needs of others, and this mission is an important facet of the firefighters' jobs... We know that job stress and burn out are issues that people in these caretaking professions should pay attention to. Consequently, we must place a higher emphasis on the psychological and emotional health of firefighters so they are physically and mentally prepared to serve the public."

Robert L. Smith, Lieutenant, Stress Management Unit, Washington Township Fire Department, Indianapolis, Indiana

Source: Smith, R. (2001). Stress management for firefighters. In R. Kemp (Ed.), Homeland security: Best practices for local government. Washington, DC: International City/County Management Association. Reprinted with permission.

Setting Boundaries

- Set personal boundaries before the crisis occurs.

- Perform a realistic assessment of your limits and what you and your staff need in order to be effective in responding to the event.
- Keep in mind that it may be harder to maintain personal boundaries in a crisis, because you also may have endured the event to which you are responding, and this can make it harder to remain emotionally detached.
- An example of a personal boundary that you might set is limiting exposure to the event during "off" hours. Although it is natural to want to keep on top of the developments in the situation while at home, constant exposure to a traumatic event takes its toll. A study on psychological responses to the events of September 11 indicated that the number of hours of television coverage an individual watched per day in the days following the attacks correlated with his or her development of posttraumatic stress disorder or symptoms of clinically significant psychological distress (Schlenger et al., 2002).

Self-Monitoring

- Be attentive to your own stress responses through continual self-monitoring.
- In monitoring your and your staff's stress, consider factors such as stamina, expectations, prior traumatic experiences, and eating habits.
- Have each staff member partner with a colleague ("buddy care"), so that they can help monitor each other's stress levels to determine when relief is needed.

> "One young officer leaning on a barricade, telling folks they could not enter this area, said to me, 'What good am I serving here away from the main site?' I told him that keeping these folks away from the center of the rescue effort keeps the rescuers' areas clear so they can do their work. This is a tremendous help to the effort. He wanted to do more. Of course, we all want to do more. The key is to do our job and do it well."
>
> Rickey Hargrave, police chaplain, Police Department, McKinney, Texas
>
> Source: Hargrave, R. (2002). Stress management for police officers. In R. Kemp (Ed.), Homeland security: Best practices for local government. Washington, DC: International City/County Management Association. Reprinted with permission.

Excessive Desensitization

- Be cautious of your and your staff's potentially harmful coping mechanisms, such as desensitization to others' emotional pain and psychological distress. One sign that you are becoming desensitized is projecting negative feelings experienced on the job onto others at home in angry or abusive ways. Compartmentalization can be an effective short-term coping mechanism, but it breaks down after a while.
- Take time, and encourage your staff to take time, to process emotions—to deal with feelings of sadness, anger, horror, or confusion and not repress them (Bull & Newman, 2003).

Talking With Others

- Offer mental health services to your employees after all community tragedies (e.g., through an Employee Assistance Program).
- Create an environment that supports seeking these kinds of services when needed.
- Consider bringing on a mental health consultant or counselor to serve as a resource for disaster mental health questions and to provide names of professionals with expertise in particular areas.
- Seek support from peers when possible and if appropriate.

GROUP DEBRIEFINGS

Be aware that the benefits of group debriefings (voluntary or mandatory and whether facilitated by a certified professional or not) have been debated (Institute of Medicine of the National Academies, 2003; National Institute of Mental Health, 2002).

The Institute of Medicine's Committee on Responding to the Psychological Consequences of Terrorism noted:

"Some workplace environments have a culture that is not conducive to seeking help for psychological issues. Seeking help or publicly sharing fears may be seen as a weakness. Alternative strategies may be necessary in such cases. An easily accessible anonymous service outside the workplace may be preferable to ensure confidentiality, and initiatives, such as group debriefings, may be less useful." (Institute of Medicine of the National Academies, 2003).

COPING WITH FIELD STRESS

The Public Health Training Network provides a useful Webcast on surviving field stress for first responders (http://www.phppo.cdc.gov/phtn/webcast/stress-05/). This Webcast, which first aired on April 28, 2005, provides descriptions and explanations of the following:

- Psychological stress
- Common causes of stress
- Mental and physical health effects of excessive stress
- Social, physical, and emotional causes of first responders' stress
- Methods to cope with field-related stress
- Strategies for assisting members of the public with their disaster-related stress in your role as a first responder

SELF-CARE AFTER THE EMERGENCY

As the response to the event starts winding down, it is important to continue to take steps to ensure that you and your staff are coping as well as possible.

- Continue monitoring your and your staff's behavioral, psychological/emotional, physical, cognitive, and social functioning, especially if you notice that you or they are experiencing challenges returning to the normal routine.
- Be aware of signs indicating that stress reduction strategies are not enough. Research has shown that some changes associated with exposure to trauma may involve a change in brain chemistry and function. The Disaster Mental Health Institute at the University of South Dakota provides the following guidelines (Jacobs, 2003), which may help you decide if your reactions, or the reactions of your staff, may require professional assistance:
    - When disturbing behaviors or emotions last more than 4–6 weeks
    - When behaviors or emotions make it difficult to function normally (including functioning at work or in the family)
    - Any time an individual feels unstable or concerned about his or her behavior or emotions

WAYS THAT MANAGERS CAN HELP RESPONSE TEAM MEMBERS REDUCE STRESS LEVELS

Management of workload	• Clarify the priorities of different tasks and the overall work plan with immediate onsite supervisor. • Recognize that "not having enough to do" or "waiting" is an expected part of crisis response. • Delegate existing "regular" workloads so that workers are not attempting disaster response and their usual jobs.
Balanced lifestyle	• Help team members avoid excessive junk food, caffeine, alcohol, or tobacco by keeping nutritious food, water, and fruit juices accessible to the team. • Provide rest areas for team members, especially on longer assignments. • Encourage team members to engage in physical exercise and gentle muscle stretching, if possible. • Encourage the development of family plans before an emergency and ensure that everyone be given the means (when possible) to send a message home.
Administrative support	• Enforce shift schedules, even if modified for the emergency (e.g., 12 hours on, with 12 hours off). • Rotate workers between high-, mid-, and low-stress tasks. • Encourage and require breaks and time away from the assignment when necessary. • Ensure that necessary supplies are available (e.g., paper, forms, pens, educational materials). • Ensure that communication tools are available (e.g., cell phones, radios).
Team support	• Suggest the use of the buddy system for support and monitoring of stress reactions. • Create a positive atmosphere of support, mutual respect, and tolerance with "thank you" and "good job" said often.
Stress reduction strategies	• Suggest that workers pace themselves between low- and high-stress activities and between providing services alone and with support. • Encourage team members to talk with coworkers, friends, family, pastors, or counselors about emotions and reactions during appropriate times. • Provide individual and group support, defusing, and debriefing, and encourage the use of mental health support for team members. • Create an exit plan for workers leaving the operation: debriefing, re-entry information, opportunity to critique, and formal recognition for service.
Self-awareness	Keep a checklist of stress-overload warning signs posted, and encourage team members to be alert for symptoms among colleagues.

Source: U.S. Department of Health and Human Services. (2004). Mental health response to mass violence and terrorism: A training manual. Rockville, MD: Center for Mental Health Services, Substance Abuse and Mental Health Services Administration, U.S. Department of Health and Human Services.

9. CONDUCTING EXERCISES FOR PREPAREDNESS

SECTION HIGHLIGHTS

This section provides tips for how to conduct useful and successful exercises and how to overcome common barriers.

- Conducting exercises is critical for preparedness.
- There are many public health aspects of emergencies to consider when planning an exercise.
- There are many excellent resources for planning and conducting successful exercises; links to key resources are included in this section.
- Federal agencies provide grants and other resources to state and local organizations to conduct exercises.

Without a doubt, the single most consistent issue among public officials, public health officials, and first responders is the need to plan for and hold drills and exercises. Many federal agencies, including the U.S. Department of Health and Human Services (HHS), have been providing grants and other resources to state and local organizations to help support such exercise programs. All around the country, the capacity for and sophistication of holding such exercises has grown tremendously since September 11. While public health officials, first responders, and other public officials have been conducting exercises, these various sectors have not always come together to plan and implement their exercises. It is the collaboration of these critical sectors that can take what is an excellent local exercise program to a greater level of sophistication and improve its value for enhancing preparedness.

This section provides some suggestions for public health aspects of emergencies that can be incorporated into your exercise program, some basic tips for planning successful exercises, and a wealth of resources to help plan and implement exercises.

PUBLIC HEALTH ASPECTS OF EMERGENCIES TO CONSIDER IN EXERCISE PLANNING

- Requesting, receiving, and distributing medications, supplies or equipment (such as ventilators) from the Strategic National Stockpile
- Distributing pharmaceuticals for treatment and/or prophylaxis
- Implementing ring or mass vaccinations
- Caring for mass casualties
- Providing care for burns or other trauma
- Setting up a mass mortuary

- Decontaminating
- Developing mutual aid networks for your community
- Providing mental health support for responders, survivors, and other community members
- Importing private health professionals from neighboring states (address licensing issues, executive orders, etc.)
- Testing other emergency-related policies
- Coordinating with hospitals and public health clinics (remember these are entirely different systems)
- Activating the Health Alert Network in your area
- Translating epidemiological investigations into policy decisions, operational/management decisions, and public communications messages
- Operating a Joint Information Center with public health and using other ways to ensure ongoing information sharing and collaboration
- Activating emergency health services available from HHS and/or the Federal Emergency Management Agency
- Communicating with the public about health risks and protective behaviors
- Providing for isolation and quarantine measures
- Evacuating and sheltering-in-place

COMMON BARRIERS TO CONDUCTING SUCCESSFUL EXERCISES

Just the thought of planning and implementing exercises can be overwhelming. Today's first responders and public officials are faced with more and more demands on training time and resources. It simply is not possible to spend as much time as one might want planning, implementing, and addressing the issues uncovered by exercises. And yet this is one of the most important challenges for all of us in the emergency response and management community. Some things that often get in the way of success include:

- Overcomplicated scenarios and drills
- The wrong people or too many people at the table
- Unclear objectives
- Time constraints
- Lack of funding
- Competing interests and priorities during the exercise

- Difficulty getting buy-in and/or funding for exercises that address catastrophic issues that would have huge consequences but are of relatively low probability

- Thinking of the exercise as a demonstration that you know what you are doing and that you cannot or should not make mistakes; similarly, thinking that nothing should "go wrong" during the exercise

> "To get to the point where you have coordination and communication among agencies, you have to have meetings months and months in advance, as well as debriefings after the events to see how to make improvements. I think the three most important points are planning, response, and debriefing, as well as making sure you have all the right players at the table. You have to make sure to be prepared for the event before it happens, instead of just reacting."
>
> *Bob DeVries, Chief, Kingman (Arizona) Police Department*

10 TIPS FOR SUCCESSFUL EXERCISES AND OVERCOMING COMMON BARRIERS

There are many ways to plan and conduct useful exercises. They don't have to be full scale, field-based exercises to be useful; they don't have to entail months of planning or expensive outside consultants. What useful exercises do require is the right people at the table, clear objectives that are tied to local threats and concerns, and a practical approach that enables the group to learn and improve plans and skills.

1. **Keep it local.** Be sure to include local issues, threats, and concerns in your scenario.

2. **Keep it simple.** Your scenario doesn't have to be complicated to be effective. To avoid confusion at the beginning, start off with an obvious emergency. A paragraph describing the situation, followed by bulleted facts, next steps, or actions that have been taken, is all that is needed to get the ball rolling. The purpose of the written scenario is to provide a common starting point for everyone involved.

3. **Have specific objectives.** You don't have to test every aspect of emergency response and management at one time. For example, you might want to separately explore:

    - Policy and interagency communications conflicts

    - Roles and coordination among agencies

    - Messages and release of public information

    - Discovery of emergency powers that may be needed to cope with public health emergencies

4. **Invite the right people to participate.** If the objectives are focused on policy conflicts, make sure the people responsible for setting policy are involved. If the objectives are related to messages and public communications, ensure that the public information officers are there.

5. **Include both operations and communications issues and personnel in the exercise.** This will help build bridges for the future.

6. **Make sure to invite public health, public officials, and first responders to the exercise, at a minimum.** The relationships forged will be invaluable for the future, and each will learn more about the others' roles, responsibilities, resources, and approaches to emergencies. Don't forget the private sector (e.g., ambulance services, hospitals) and other officials to improve cross-disciplinary collaboration.

7. **Keep participants focused on the exercise.** Do everything you can to take people away from their desks and cell phones for at least a limited time (start with a 2-hour exercise) to minimize day-to-day distractions.

8. **Keep your eye on the ball.** The purpose of exercises is to explore how you will approach a problem, go through the motions of the response, and discover gaps in procedures, policies, and skills that need to be addressed. Successful exercises are not used simply to demonstrate that your procedures are sound—they are used to continually improve plans, build relationships, and improve infrastructures to address whatever may happen in the future.

9. **Make the actions as real as possible during the exercise, even for small, tabletop exercises.** For example, if someone says, "we'd call so-and-so to take care of this," have them pick up the phone and call that person. Make sure they have the right number, that the person is still in that position, and that he or she would be able to take the expected action.

10. **Follow up on your exercise.** Don't just walk away when it's over. Make a written list of lessons learned and implications for next steps and improvements. Make a plan for getting those things done. Don't allow your debriefing to deteriorate into a rehash of what happened or did not happen. Focus instead on the implications for improving preparedness.

RESOURCES FOR EXERCISING

The following resources are listed alphabetically by organization. Most of these resources are health-oriented, but we have also included a few resources focused more broadly on all hazards or on terrorism.

CENTERS FOR DISEASE CONTROL AND PREVENTION

Smallpox: An Attack Scenario

http://www.cdc.gov/ncidod/EID/vol5no4/otoole.htm

The smallpox scenario is intended to provoke thought and dialogue that might illuminate the uncertainties and challenges of bioterrorism and stimulate review of institutional capacities for rapid communication and coordinated action in the wake of an attack.

FEDERAL EMERGENCY MANAGEMENT AGENCY

Compendium of Federal Terrorism Training for State and Local Audiences

http://www.fema.gov/compendium/course_detail.jsp?id=239

This course consists of five separate scenarios, each using a different terrorist weapon. The objectives of the course are to (1) evaluate a jurisdiction's ability to respond to and recover from terrorist attacks and (2) develop a plan to improve the jurisdiction's ability to respond to and recover from terrorist attacks.

Comprehensive Exercise Curriculum

http://www.training.fema.gov/emiweb/CEC/CECCourses.asp

The Comprehensive Exercise Curriculum provides a comprehensive array of classroom and hands-on experiences designed to improve the individual's ability to manage exercise programs and administer emergency management exercises.

The Comprehensive Exercise Curriculum Job Aids

http://www.training.fema.gov/emiweb/CEC/CECJobaids.asp

This Web site provides resources to help in planning, executing, and evaluating a local exercise.

Emergency Management Master Exercise Practitioner Program

http://www.training.fema.gov/emiweb/CEC/emiopt.asp

Emergency Management Master Exercise Practitioner Program eligibility is open to local, state, territorial, tribal, U.S. Department of Homeland Security, and other federal agency emergency management and emergency services personnel whose responsibilities involve emergency management exercises.

Independent Study Program: Exercise Design

http://training.fema.gov/EMIWeb/IS/is139.asp

This free, online course covers the purpose, characteristics, and requirements of three main types of exercises: tabletop exercises, functional exercises, and full-scale exercises. In addition, this course covers exercise evaluation, exercise enhancements, and design for a functional exercise.

NATIONAL ASSOCIATION OF COUNTY AND CITY HEALTH OFFICIALS

Conducting a BT-Table Top: A "How To" Guide

http://www.naccho.org/toolbox/Conducting%20a%20BT%20Tabletop_a%20how%20to%20guide.pdf

This guide provides state and local officials with information and guidance on the key ingredients to consider when developing and facilitating a tabletop exercise.

NORTH CAROLINA CENTER FOR PUBLIC HEALTH PREPAREDNESS

Tabletop Exercises

http://www.sph.unc.edu/nccphp/training/all_materials/am_tabletop.htm

This Web site provides information and links to various tabletop exercises dealing with bioterrorism agents.

NORTHWEST CENTER FOR PUBLIC HEALTH PRACTICE

Bioterrorist Attack on Food: A Tabletop Exercise

http://www.nwcphp.org/training/courses-exercises/courses/bioterrorist-attack-on-food

This exercise will enable participants to identify the communication, resources, data, coordination, and organizational elements associated with an emergency response. Although the primary goal of this exercise is to address agencywide policies and issues, it also offers participants an opportunity to assess their own preparedness for responding to the scenario and to identify individual needs for information or training.

U.S. DEPARTMENT OF HOMELAND SECURITY

First Responders—Resource Links

http://www.dhs.gov/xfrstresp/

This resource for first responders supplies links to grants, training and exercises, information sharing tools, and the U.S. Department of Homeland Security standards and guidelines.

Homeland Security Exercise and Evaluation Program

https://hseep.dhs.gov/

This resource provides a standardized policy, methodology, and terminology for exercise design, development, conduct, evaluation, and improvement planning. It also facilitates the creation of self-sustaining, capabilities-based exercise programs by providing tools and resources such as guidance, training, technology, and direct support.

Lessons Learned Information Sharing

https://www.llis.dhs.gov/

The Web site acts as a national network of lessons learned and best practices for emergency-response providers and homeland security officials.

10. POST-EVENT: LEADING YOUR COMMUNITY TOWARDS RECOVERY AND RESILIENCY

SECTION HIGHLIGHTS

This section helps community leaders understand the wide range of reactions people might have to an emergency and offers resources for recovery.

- Leadership is a key factor in helping communities recover from an event and develop resiliency.
- The psychological effects of traumatic events can be widespread and can occur far from the actual event.
- The intensity of reactions can vary depending on the magnitude of the disaster, the level of trauma experienced, and other factors.
- A variety of materials and services are available to help all members of your community, including older adults and children.

As a leader, it is likely that your role will include helping your community cope with the impact of terrorism or a public health emergency and return to a regular routine. When the dust settles, you, your community, colleagues, and family might experience a wide range of reactions. This section describes those reactions and offers a list of resources that can help you lead your community down the road to recovery and resiliency.

One dictionary defines resiliency as a human ability to recover quickly from disruptive change, illness, or misfortune without being overwhelmed or acting in dysfunctional ways. However, in the context of public health emergencies, it can also be understood as not just struggling through from one crisis to another, but developing skills to learn how to become a stronger person along the way (adapted from: Houghton Mifflin Company. 1982. American Heritage Dictionary: 2nd College Edition).

As the frantic immediacy of the event passes, the issues and questions that community members are dealing with will become more complex and difficult to resolve. Depending on the type of event that occurred, there may be long-term physical health effects, economic problems, and infrastructure issues for the community as a whole. In addition, as on September 11, first responders may be among those most seriously affected, and there may need to be considerable reinforcement of those forces in order to fully restore the community services needed for a full recovery. Specific segments of the community may also be disproportionately affected.

A strong leader can help community members not only muster the stamina for the long road ahead but also help people learn from the event and transform negativity into resiliency for the future. As the days after September 11 demonstrated, America is a resilient society, but leadership plays a big part of fostering continued resiliency.

Because some issues a community will face may be unique, this section focuses on the psychological reactions and issues that a community is likely to face regardless of the type of event.

UNDERSTANDING THE REACTIONS OF THE COMMUNITY

RECOGNIZING THE RIPPLE EFFECT

Terrorism and disasters erode our sense of safety and sense of security—two of the most basic human needs. The physical impact of a terrorist or other public health emergency involving mass trauma and casualties is concrete and visible. The psychological impact, however, is much more subtle in nature, sending waves of shock and distress throughout the community, state, and nation. As such, the psychological suffering from an act of terrorism or a disaster may be more extensive than the physical injuries (Institute of Medicine of the National Academies, 2003). Even a widespread disease outbreak, such as an influenza pandemic, can cause trauma and suffering in those who have not been physically affected.

THE RIPPLE EFFECT

The basic law of terrorism is that even the smallest threat can ripple out to touch people a thousand miles away. The basic goal of psychological interventions is to understand the traumatic impact of terrorism and to use that understanding to minimize and contain the ripple effect within the individual, community, and our nation (Helping to Heal, American Psychological Association Report on the Oklahoma City Bombing, 1997).

Source: Community Resilience Project of Northern Virginia, Commonwealth of Virginia Department of Mental Health, Mental Retardation, and Substance Abuse Services. (2004). Helping to heal: A training on mental health response to terrorism. Washington, DC: American Institutes for Research.

RANGE OF REACTIONS

People who are exposed to traumatic events may experience a variety of reactions. These responses may be very different from reactions they have had to other stressful events in their lives in the past, and that difference itself can be unsettling and even frightening. Nevertheless, the majority of people's reactions are ordinary reactions to extraordinary events.

For most people, the resumption of everyday activities after a crisis and the resolution of stress reactions is an automatic process requiring little or no intervention other than "tincture of time." But for others, the return to a regular routine is much more challenging. Any person, regardless of existing coping skills or psychological strength, may be particularly moved by a specific event. This is a sign of being human, not of being weak.

Table 10-1 lists some reactions common to people who experience traumatic stress. Although these cognitive, emotional, behavioral, and physical reactions can be upsetting, they are normal reactions to extreme stresses (Jacobs, 2003).

TABLE 10–1. REACTIONS COMMON TO PEOPLE WHO EXPERIENCE TRAUMATIC STRESS

COGNITIVE REACTIONS	EMOTIONAL REACTIONS	BEHAVIORAL REACTIONS	PHYSICAL REACTIONS
Recurring dreams, nightmares, or thoughts about the event	Feeling frightened or anxious when reminded of the event	Avoiding activities or places that bring back memories of the event	Stomach upset/nausea
Having difficulty concentrating or remembering	Feeling numb, withdrawn, empty, or depressed	Isolating oneself from or having increased conflict with others	Diarrhea and cramps
Questioning one's spiritual or religious beliefs	Feeling bursts of anger or intense irritability	Startling easily, being tearful for no apparent reason, and having trouble sleeping	Elevated heart rate, blood pressure, or blood sugar

A person experiencing any of these reactions may need to seek assistance from a mental health or medical professional if the reaction interferes with daily functioning. In addition, the following reactions may indicate the need for medical intervention or a mental health evaluation:

- Disorientation
- Inability to care for oneself
- Inability to manage the activities of daily living
- Persistent flashbacks that do not diminish over time
- Suicidal or homicidal thoughts or plans
- Problematic use of alcohol or drugs
- Domestic violence, child abuse, or elder abuse
- Posttraumatic stress disorder

PHYSICAL EFFECTS OF STRESS

Numerous studies have found that trauma has negative effects on physical health. People who are exposed to traumatic events may be at increased risk not only for posttraumatic stress disorder but also major depression, panic disorder, generalized anxiety disorder, and substance abuse. They may also have physical illnesses, including hypertension, asthma, and chronic pain syndromes (Yehuda, 2002). One study found that adults who reported traumatic experiences as children had higher rates of serious medical conditions, including cancer, heart disease, and chronic lung disease (Felitti et al., 1998).

> "The aim of terror is to break a society's resolve, to separate a society from its traditional values, to cause it to break internally. The result of ongoing terror is that people in Northern Ireland have experienced rising rates of alcoholism, domestic violence, suicide, smoking, drug abuse, and a general hollowing out of society. The violence has stopped, but we still don't know how deeply the poison has run."
>
> *Conor Brady, former editor, The Irish Times*
> *From Reporting on Terrorism: The News Media and Public Health*

FACTORS THAT INFLUENCE INTENSITY OF REACTIONS

In an emergency, stress reactions often surface after people have grappled with their immediate physical situations. The intensity of the reaction is determined by the magnitude of the disaster, the level of trauma experienced, and individual coping and stress management abilities. The intensity of the reaction may also be influenced by certain characteristics of the emergency, such as:

- Threat to life
- Severe physical harm or injury
- Suffering intentional injury or harm
- Exposure to images of the grotesque
- Violent or sudden loss of a loved one
- Witnessing or learning of violence toward a loved one
- Exposure or fear of exposure to a noxious agent
- Intentional death or harm caused by others
- A large number of deaths, especially the deaths of children

People experience emergencies through their own individual lenses. The meaning that a person assigns to the emergency and their personality, world view, and spiritual belief all contribute to how each person will perceive, cope with, and recover from the event (DeWolfe, 2000).

COMMUNITY MEMBERS WITH SPECIAL NEEDS

Children, adolescents, and older adults may react differently to a traumatic experience. Terrifying events can cause overwhelming and unfamiliar physical and emotional reactions that can traumatize children, whereas older adults' reactions to terrorism may be greatly affected by their physical needs. When an older adult already feels vulnerable due to changes in health, mobility, or cognitive ability, the feelings of powerlessness that may result from a terrorist event can be overwhelming. For more information on how to help community members with special needs, please see the additional resources at the end of this section.

ACTIVITIES THAT CAN HELP COMMUNITIES RECOVER

Officials and leaders can take important steps to promote societal post-crisis recovery. Here are a few suggestions:

- Provide memorials and opportunities to grieve.
- Celebrate heroes and acknowledge victims.
- Recognize anniversaries.
- Create opportunities for those who suffered badly or continue to suffer.
- Take effective post-crisis actions, including improving local preparedness.

WORKING WITH LOCAL VOLUNTEER ORGANIZATIONS AND COMMUNITY PARTNERS

Some of your best resources for helping your community recover from a traumatic event are local organizations and institutions in the community, including the American Red Cross, the faith community, social service organizations, and schools. These types of local organizations can reach all sectors of the community—including those that are most vulnerable to trauma. Although you may already have relationships and partnerships with some of these organizations, consider branching out to other organizations or strengthening existing relationships before a disaster happens.

HELPING THE COMMUNITY COPE: ADDITIONAL RESOURCES

You might want to consider making these materials, Web sites, and other resources available to your community members and/or staff. They may be helpful resources as you develop emergency plans and plan how to restore your community once the response to an emergency is over.

SERVICES AND TRAINING

Substance Abuse and Mental Health Services Administration and Federal Emergency Management Agency

http://www.samhsa.gov

http://www.fema.gov

Through a collaborative agreement with the Federal Emergency Management Agency, the Substance Abuse and Mental Health Services Administration (SAMHSA), an agency within the U.S. Department of Health and Human Services, administers crisis counseling, training programs, and community outreach after presidentially-declared disasters. The SAMHSA Emergency Response Grant (SERG) program also provides limited resources for communities needing mental health and substance abuse emergency response services when a presidential declaration of disaster has not occurred.

Emergency Management Institute

http://www.training.fema.gov/

The Emergency Management Institute offers many courses for first responders and public officials. The course "Recovery from Disaster: The Local Government Role," which comes in a 4-day version taught at the Emergency Management Institute and a one-and-a-half day version that is taught in the field, is one that may be particularly useful in helping public officials help their communities recover. Other courses from the 2006–07 catalogue can be found at http://www.usfa.dhs.gov/downloads/pdf/publications/fa-273-508.pdf.

State and Local Health Departments

Contact your state or local health department for more information on federal and/or state grants, disaster response plans, and mental health services that might be offered in your community to assist in the preparation for, or aftereffects of, a public health emergency or terrorist event.

SPECIFIC PUBLICATIONS

Center for Mental Health Services

http://mentalhealth.samhsa.gov/

- **Care Tips for Survivors of a Traumatic Event: What to Expect in Your Personal, Family, Work, and Financial Life,** available at http://mentalhealth.samhsa.gov/publications/allpubs/KEN-01-0097/default.asp.
  Covers things to remember when trying to understand disaster events, signs that adults need stress management assistance, and ways to ease stress

- **Mental Health Aspects of Terrorism,** available at http://mentalhealth.samhsa.gov/publications/allpubs/KEN-01-0095/default.asp.
  Describes typical reactions to terrorist events and provides suggestions for coping and helping others

- **Anniversary Reactions to a Traumatic Event: The Recovery Process Continues,** available at http://mentalhealth.samhsa.gov/publications/allpubs/NMH02-0140/default.asp.
  Describes anniversary reactions among victims of traumatic events and explains how these reactions can be a significant part of the recovery process

National Institute of Mental Health

http://www.nimh.nih.gov

- **Helping Children and Adolescents Cope with Violence and Disasters,** available at http://www.nimh.nih.gov/publicat/violence.cfm.
  Describes the impact of violence and disasters on children and adolescents and offers suggestions for minimizing long-term emotional harm

National Mental Health Association

http://www.nmha.org/

- **How to Cope with the War & Threats of Terrorism: Tips for Older Adults,** available at http://www1.nmha.org/reassurance/olderadulttipsWar.cfm.
  Outlines some common responses of older adults following a disaster and provides tips for coping

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No additional resources.

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APPENDICES

APPENDIX A. RESOURCE LIST

FIRST RESPONDER RESOURCES

Crisis and Emergency Risk Communication: By Leaders for Leaders Course Book and Training Materials
Centers for Disease Control and Prevention
http://www.bt.cdc.gov/erc/

After-Action Report on the Response to the September 11 Terrorist Attack on the Pentagon
Arlington Office of Emergency Management
http://www.arlingtonva.us/Departments/fire/edu/about/docs/after_report.pdf

Responding to Incidents of National Consequence: Recommendations for America's Fire and Emergency Services Based on the Events of September 11, 2001, and Other Similar Incidents
Federal Emergency Management Agency
http://www.usfa.fema.gov/downloads/pdf/publications/fa-282.pdf

Project Responder Interim Report: Emergency Responders' Needs, Goals, and Priorities
Hicks & Associates, Inc.
http://www.mipt.org/pdf/projectresponderneeds.pdf

Lessons Learned Information Sharing
U.S. Department of Homeland Security Office for Domestic Preparedness (ODP)
https://www.llis.dhs.gov/

Homeland Security Exercise and Evaluation Program, Volume I: Overview and Doctrine
U.S. Department of Homeland Security Office for Domestic Preparedness (ODP)
http://www.ojp.usdoj.gov/odp/docs/HSEEPv1.pdf

Fire and Emergency Services Preparedness Guide for the Homeland Security Advisory System
Emergency Management and Response Information Sharing and Analysis Center (EMR-ISAC)
http://www.emergency.com/2004/hsas-guide.pdf

Model Procedures for Responding to a Package with Suspicion of a Biological Threat
International Association of Fire Chiefs (IAFC)
http://www.iafc.org/associations/4685/files/suspicious_packages.pdf

Law Enforcement Officers Guide for Responding to Chemical Terrorist Incidents
U.S. Army Soldier and Biological Chemical Command (SBCCOM), Homeland Defense Business Unit
http://www.mipt.org/pdf/leofficersguideChemicalIncidents.pdf

IACP Project Response—Leading from the Front: Law Enforcement's Role in Combating and Preparing for Domestic Terrorism
International Association of Chiefs of Police (IACP)
http://www.theiacp.org/documents/pdfs/Publications/Terrorism.pdf

Emergency Responder Guidelines
U.S. Department of Homeland Security Office for Domestic Preparedness (ODP)
http://www.mipt.org/pdf/emergencyresponderguidelines.pdf

Guidelines for Responding to a Chemical Weapons Incident
U.S. Army Soldier and Biological Chemical Command (SBCCOM), Domestic Preparedness Chemical Team
http://www.au.af.mil/au/awc/awcgate/army/sbccom_chem_response.pdf

Hazardous Materials Guide for First Responders CD-ROM
United States Fire Administration (USFA)
Can be ordered at no cost from:
http://www.usfa.fema.gov/applications/publications/display.cfm?id=&mc=33&sc=16&ol=&it=&st=&sp=&sr=1&rp=5&sp=

Guide to Managing and Emergency Service Infection Control Program
United States Fire Administration (USFA)
http://www.usfa.fema.gov/downloads/pdf/publications/fa-112.pdf

Guidelines for Haz Mat/WMD Response, Planning and Prevention Training
United States Fire Administration (USFA)
http://www.usfa.fema.gov/downloads/pdf/publications/hmep9-1801.pdf

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http://www.hhs.gov/emergency/

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Disaster Readiness and Response: ICMA InfoPak
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APPENDIX B. BIOLOGICAL AGENTS

This section provides basic information on six biological agents that may potentially be used by terrorists as weapons:

- Anthrax
- Botulism
- Plague
- Smallpox
- Tularemia
- Viral Hemorrhagic Fevers

These agents are classified as Category A (highest concern) by the Centers for Disease Control and Prevention (CDC) because they have the potential for major public impact and are known to have been studied by some countries for use in biological warfare.

Information on other possible biological agents can be found in the reference guide at http://www.hhs.gov/emergency or at http://www.bt.cdc.gov.

Please note that the descriptions of signs and symptoms in this section are not meant to be used to self-diagnose illness—they are for informational purposes only. Contact a health care provider if you suspect that you have been exposed to one of these agents or if you feel sick.

BIOLOGICAL AGENTS QUICK REFERENCE CHART

AGENT	DESCRIPTION	FIRST SIGNS AND SYMPTOMS	FIRST ACTIONS	MEDICAL RESPONSE
Anthrax	Skin, intestinal, or inhalational infection that is caused by bacteria. Signs and symptoms begin within 7 days. Not contagious.	**Skin:** blisters with black center. **Intestinal:** nausea, loss of appetite, like stomach flu. **Inhalational:** flu-like signs and symptoms that progress to severe breathing problems.	Contact your health provider.	Antibiotics should be started as soon as possible.
Botulism	Muscle-paralyzing disease caused by exposure to a bacterial toxin. Could be released in air, water, or food. Not contagious.	Blurred/double vision, slurred speech, drooping eyelids. Can lead to paralysis.	Immediately seek medical care.	Antitoxin and/or supportive care and/or ventilator.

AGENT	DESCRIPTION	FIRST SIGNS AND SYMPTOMS	FIRST ACTIONS	MEDICAL RESPONSE
Pneumonic Plague	Lung infection caused by bacteria. Could be released into the air. Signs and symptoms generally begin within 2–4 days of exposure. Contagious through coughing.	Rapidly developing pneumonia with fever, cough, and chills.	Immediately seek medical care.	Antibiotics must be started within 24 hours of signs and symptoms. Isolation for infected persons.
Smallpox	Severe illness with rash caused by a virus. Officially eradicated worldwide in 1980, but has resurfaced as a potential bioterrorist agent. Signs and symptoms begin within 7–17 days of exposure. Contagious.	High fever and aches followed by a severe rash of round lesions.	Contact your health provider.	Vaccines should generally be given within 3 days of exposure to prevent infection or lessen illness. Isolation for infected persons.
Tularemia	Disease caused by bacteria, which could be released in air, food, or water. Signs and symptoms generally begin within 3–5 days of exposure. Not contagious.	Sudden fever, chills, coughing, aches.	Contact your health provider.	Antibiotics.
Viral Hemorrhagic Fevers	Diseases contracted from viruses such as Ebola. Could be transmitted via bodily fluids of infected animals or humans. Contagious.	Fever, vomiting, diarrhea, heavy bleeding.	Immediately seek medical care.	Isolation for infected persons. Supportive care.

BASIC FACTS FOR BIOLOGICAL AGENTS

INFECTIOUS DISEASES

Infectious diseases are caused by the invasion of the body by harmful microorganisms. These microorganisms multiply and make the person sick by attacking organs or cells in the body. They include viruses and bacteria, as well as certain other microscopic organisms, and are sometimes called pathogens. All of the diseases discussed in this section are considered infectious diseases.

CONTAGIOUS DISEASES

A **contagious disease** is an infectious disease that can be "caught" by a person who comes into contact with someone who is infected. Not all infectious diseases are contagious. Exposure to a contagious disease usually happens through contact with the infected person's bodily fluids or secretions, such as a sneeze.

TOXINS

Toxins are the poisonous, usually protein-based substances produced by microorganisms (bacteria, mold, virus) in certain infectious diseases. Microorganisms use these toxins as the specific weapons for attacking organs or cells in the body. Although toxins are usually classified as being biologically produced, common language often refers to the poisons created by nonliving chemical agents as chemical toxins.

BACTERIA AND VIRUSES

Bacteria

- One-celled microorganisms that contain several components within the single cell.
- Some bacteria can also exist as spores that help them survive harsh conditions. Spores can germinate to become full-fledged bacteria; this is the case with anthrax.
- Antibiotics can be used to kill bacteria.

Viruses

- Bits of deoxyribonucleic acid (DNA) or ribonucleic acid (RNA).
- Viruses need to infect living cells to survive and multiply.
- Antibiotics do not affect viruses; some antiviral medications exist.

DELIVERY OF BIOLOGICAL AGENTS

- The ability to successfully deliver a biological attack depends on:
    - The type of agent or organism
    - The method of dissemination
    - The weather (e.g., wind speed, humidity, time of day, precipitation, temperature)

- Biological agents can enter the body through absorption, inhalation, ingestion, and injection.
- Biological weapons can be delivered by:
  - Wet or dry aerosol sprayers
  - Explosive devices
  - Transmission through insects, animals, or humans
  - Introduction into food, water, or even medications
  - In or on objects, in some cases (e.g., anthrax in envelopes)

BIOLOGICAL TESTING

Quick diagnosis and treatment of a patient exposed to a biological agent are key to saving that patient's life. A biological attack may go unnoticed until large groups of people begin exhibiting signs and symptoms. But currently there is no single test that can diagnose whether a person has been exposed to biological agents. It is likely that a combination of tests will be used. In the absence of immediate results, physicians who suspect bioterrorism may begin a preliminary course of treatment until the lab results are in. There is no single answer to the question of how long testing will take. The testing of biological agents is complicated by several factors, which can affect timing. These factors include:

- Identifying the Agent: Actual incidents of bioterrorism have been rare, leaving today's physicians with limited experience in identifying these agents in the lab or treating affected patients. The first patients who become sick may be mistaken for having other illnesses, thus causing a delay in the effort to test for biological agents.
- Presumptive vs. Confirmatory Diagnoses: Not all tests are conclusive. Some tests can give a presumptive diagnosis that an agent is present, but followup tests are needed. In general, presumptive diagnosis of an agent can usually be made in about a day. Confirmatory diagnosis can take 2–3 days.
- Viral, Bacterial, or Toxin Load: The "load" refers to how much of the agent is present in a patient. If relatively large amounts of an agent are present in a patient, cultures designed to grow the bacteria or virus could take as little as a few hours. If smaller amounts of the agent are present in a patient, these same culture tests could take up to 2 or 3 days.
- Lab Capabilities: Can the needed tests be done in local labs, near a suspected attack, or do the samples need to be shipped out to more advanced labs, thus affecting the overall timeline? Shipping samples to more advanced labs can tack on an extra day or two to the wait time. CDC's Laboratory Response Network (http://www.bt.cdc.gov/lrn) helps facilitate this process.
- The Kind of Test That Is Used: Numerous tests are employed to detect the presence of bioterror agents. Blood cultures can take up to 3 days, in some cases for example, but Gram

stains can be ready within an hour. However, some of these quicker tests will only give preliminary information, which must be confirmed with more comprehensive tests.

More information on testing can be found in the media reference guide at http://www.hhs.gov/emergency.

You may notice that specific guidance on food and water safety after a terrorist attack is not included in this guide. The effect of an attack or other public health emergency on food and water supplies is very situation specific. As a result, public health officials will provide specific information on food and water safety as needed.

ANTHRAX

BASIC FACTS

- Rod-shaped bacteria (not a virus) that can be treated with antibiotics if diagnosed early.
- Anthrax is the disease that develops after exposure to spores produced by these bacteria.
- The spores can remain dormant for long periods but are still capable of causing infection when someone comes in contact with them by touching or breathing them in.
- The anthrax illness is not contagious.
- A new vaccine is currently being produced for the Strategic National Stockpile (SNS) in case of an attack. An older anthrax vaccine exists but is not in widespread use.

ANTHRAX ILLNESSES

- Anthrax spores can cause three types of illness, depending on how a person is exposed:
  - Inhalational (respiratory)—most lethal
  - Cutaneous (skin)
  - Gastrointestinal (digestive)

Inhalational Anthrax

Exposure

- Victims breathe in spores floating through the air; the spores then lodge in their lungs.
- Certain cells take the spores to the lymph nodes surrounding the lungs. Once the spores enter the lymph nodes, they germinate into bacteria and cause inflammation and enlargement of these lymph nodes.
- Anthrax bacteria then spread from the lymph nodes to sites throughout the body and produce a toxin that can be destructive to organs and is difficult to treat.

Signs and Symptoms

Signs and symptoms can occur within 7 days of infection or can take up to 42 days to appear. These signs and symptoms include:

- Fever (>100°F)
- Flu-like signs and symptoms
- Cough, chest discomfort, shortness of breath, fatigue, or muscle aches
- Sore throat, followed by difficulty swallowing; enlarged lymph nodes; headache; nausea; loss of appetite; abdominal distress; vomiting; or diarrhea

Recovery/Mortality Rate

The survival rate for inhalational anthrax victims depends on quick diagnosis and treatment with antibiotics. The mortality rate is approximately 75 percent even with antibiotics, while untreated inhalational anthrax has a 90 percent mortality rate.

Cutaneous Anthrax

Exposure

Anthrax spores or bacteria enter the body through an open wound or cut or microscopic breakdowns of the skin.

Signs and Symptoms

- Signs and symptoms appear within 1–7 days after exposure.
- A small sore quickly develops into a blister, which becomes a skin ulcer and ultimately develops a black scab in the center.
- The sore, blister, and ulcer do not hurt and initially look like a spider bite.

Recovery/Mortality Rate

The survival rate is 80 percent without treatment and more than 99 percent with treatment.

Gastrointestinal Anthrax

Exposure

Gastrointestinal anthrax occurs when anthrax is ingested, usually through meat from anthrax-infected animals.

Signs and Symptoms

- First signs and symptoms of the infection appear within 2–5 days of exposure, including initial signs and symptoms of nausea and loss of appetite and later signs and symptoms of bloody diarrhea, fever, and severe stomach pain.
- Signs and symptoms mirror those for stomach flu, food poisoning, and appendicitis.

Recovery/Mortality Rate

If untreated, at least 25 percent of gastrointestinal anthrax cases lead to death.

DIAGNOSIS

Early diagnosis is the key to successful treatment of anthrax. However, there is no single screening test to confirm anthrax illness.

- Blood tests may be used, but can take up to 72 hours.
- If inhalational anthrax is suspected, physicians typically obtain a chest X-ray and a CAT scan.
- Nasal swabs can detect the presence of spores, but are not a diagnostic tool. A positive swab does not mean a person will develop an anthrax illness, and a negative swab does not mean a person will not develop an anthrax illness. A nasal swab is only an indicator of whether anthrax spores are present in an area.

TREATMENT

- All three types of anthrax can be treated with antibiotics. Ciprofloxacin may be used, but doxycycline is now the preferred antibiotic. Antibiotics are prescribed for 60 days.
- Treatment must begin as soon as possible after exposure to be successful, because the bacteria produce a toxin in the body that poisons the system quickly and sometimes irreversibly. Antibiotics kill the bacteria but cannot remove the toxin or lessen the effects of any toxin already in the body. There is no antitoxin for the anthrax toxin.
- Those with inhalational anthrax may need hospitalization and a ventilator to help with breathing.

BOTULINUM TOXIN

BASIC FACTS

- Botulism is a muscle-paralyzing disease that develops after a person is poisoned with botulinum toxin, which is produced by the bacterium Clostridium botulinum (not a virus).
- The toxin is colorless, odorless, and tasteless and can be disseminated via air, water, or food.
- Botulism is not contagious.
- A rare form of botulism, wound botulism, will not be discussed here.

BOTULINUM TOXIN ILLNESSES

Foodborne Botulism

Exposure

- This form of botulism is typically caused by eating improperly preserved or cooked food; it could also occur if food were contaminated deliberately with the toxin.
- Contaminated food may be discolored or have a bad odor or taste.

Signs and Symptoms

- Generally begin 18–36 hours after eating contaminated food but can occur as early as 6 hours or as late as 10 days afterwards.
- Initial signs and symptoms include blurred or double vision, slurred speech, drooping eyelids, difficulty swallowing, dry mouth, and muscle weakness.
- Botulism toxin spreads throughout the body and predominantly affects the nervous system.
- Within hours, a facial paralysis begins and spreads to the rest of the body.
- Botulism can result in respiratory failure.

Recovery/Mortality Rate

If treated, ingested botulism has a survival rate of over 90 percent.

Inhalational Botulism

Exposure

- Does not occur naturally and only three cases (from a laboratory accident) have ever been reported
- Would be caused if people inhaled refined botulinum toxin disseminated through the air

Signs and Symptoms

- Similar to those of foodborne botulism.
- Signs and symptoms may begin several hours to several days after an airborne attack.

Recovery/Mortality Rate

Because there are so few recorded cases, the fatality rate is unclear.

DIAGNOSIS

Botulism is a rare disease. Whether it is naturally occurring or the result of terrorism, a single case of the illness may be difficult for physicians to diagnose. However, if several or many cases appear together, it is likely that the diagnosis would be made quickly.

- There is no single test to detect botulinum poisoning. Blood tests and stool sample tests may be useful.
- Suspected foods may also be tested.
- Special tests (e.g., brain scan) may be needed to exclude similar conditions from botulism.

TREATMENT

Prompt medical attention is the key to successful treatment for a botulism illness.

- Treatment should begin as soon as botulism is suspected and may include use of an antitoxin.
- This antitoxin reduces the spread of paralysis but will not reverse paralysis that has already set in.
- With treatment, most paralysis will eventually go away, but in severe cases, patients may need long-term care, including a ventilator.

PLAGUE

BASIC FACTS

- Plague is the disease that develops after infection with the bacterium yersinia pestis (not a virus).
- Humans contract plague by inhaling it or from the bite of an infected flea.
- Plague infection takes three primary forms:
    - Bubonic
    - Pneumonic
    - Septicemic
- Only pneumonic plague is contagious through respiratory droplets with direct close contact (within 6 feet).
- Plague is highly lethal if untreated but can be treated with antibiotics if caught early.
- Some plague infections occur naturally each year (usually bubonic).

PLAGUE ILLNESSES

There are three common forms of illness caused by the plague bacteria:

Bubonic

Exposure

- Bubonic plague is caused when infected fleas bite humans or through a break in the skin.

- This form of plague illness is not contagious.

Signs and Symptoms

- Bubonic plague infects the lymphatic system and causes severe swelling.
- The first signs and symptoms appear 2–6 days after infection and include weakness, high fever, and chills.
- If bubonic plague is not treated, bacteria can spread through the bloodstream, causing septicemic plague or a secondary case of pneumonic plague.
- Later signs and symptoms include muscular pain, swelling of lymph glands, and seizures.

Recovery/Mortality Rate

If untreated, bubonic plague is fatal in over 50 percent of cases.

Pneumonic

Exposure

- This form of the disease infects the lungs. It is caused by breathing in aerosolized plague.
- This illness can be transmitted from person to person through respiratory droplets with direct close contact (within 6 feet).

Signs and Symptoms

- Signs and symptoms usually appear 2–4 days (range of 1–6 days) after exposure.
- Initial signs and symptoms include high fever, cough, and chills similar to the flu.
- Later signs and symptoms include pneumonia and bloody sputum (coughing up blood).

Recovery/Mortality Rate

Without early detection and treatment, the mortality rate from pneumonic plague is nearly 100 percent. If treated, the mortality rate from pneumonic plague is still 50 percent.

Septicemic

Exposure

- Septicemic plague may be a secondary illness caused by complications from bubonic or pneumonic plague, or it can occur by itself.
- Plague bacteria enter the bloodstream.
- This form of the disease is not contagious.

Signs and Symptoms

- Signs and symptoms appear 2–6 days after infection.

- Initial signs and symptoms include nausea, vomiting, fever, and chills.
- Later signs and symptoms include low blood pressure, abdominal pain, shock, and, finally, internal bleeding.

Recovery/Mortality Rate

Death occurs rapidly if this form of plague is untreated, but even with treatment, the recovery rate is only 50 percent.

DIAGNOSIS

Plague can be difficult to diagnose because its initial signs and symptoms are flu-like and the disease progresses so rapidly. A bioterror attack involving plague could go undetected until large groups of people begin exhibiting signs and symptoms.

- If bubonic plague is suspected, physicians check for the presence of a painful, swollen lymph node called a bubo, which occurs no more than 24 hours after initial signs and symptoms.
- Blood cultures, a sputum sample, or examination of a lymph node sample can confirm plague.
- Physicians will ask for a travel history from the patient to see if he or she has traveled to a known outbreak area.

TREATMENT

- Antibiotic treatment for pneumonic plague must begin within 24 hours after the first signs and symptoms to be successful.
- Antibiotics, such as streptomycin, gentamicin, the tetracyclines, and chloramphenicol, are all effective against plague and may be provided to those exposed or with a suspected diagnosis.
- Patients with pneumonic plague should be isolated to prevent disease spread.

SMALLPOX

BASIC FACTS

- The smallpox virus (*Variola Major*) is moderately contagious; direct, face-to-face contact is usually required to spread the disease.
- Characterized by skin lesions and high fever, smallpox historically has killed approximately 30 percent of those infected.
- Officially eradicated in nature in 1980, smallpox has more recently been of concern as a potential bioterrorism threat.
- Routine vaccinations in the United States ended in 1972. At present, a large portion of the population is considered vulnerable to infection should a bioterrorism incident occur.

SMALLPOX ILLNESS

Exposure

- The incubation period is typically 7–17 days following exposure.
- Typically, people with smallpox are not contagious until lesions start appearing and they are obviously ill.
- The virus is usually spread by droplets, however, having it spread by aerosol or contaminated objects (e.g., bedding) is also possible.
- Smallpox is not known to be transmitted by insects or animals.

Signs and Symptoms

- Initial signs and symptoms of smallpox may include high fever, fatigue, headache, and backache.
- *Two to three days* after the onset of signs and symptoms: A rash of round lesions develops on the face, arms, and legs. At the same time, lesions in the mouth are also present and release large amounts of the virus into the saliva.
- *Seven days* after the onset of signs and symptoms: The lesions become small blisters and, by the seventh day, are filled with pus.
- *Twelve days* after the onset of signs and symptoms: Lesions begin to crust over. Severe abdominal pain and delirium can occur in the later stages of the disease.
- *Three to four weeks* after the onset of signs and symptoms: Scabs develop and fall off. A patient who survives is no longer contagious after the final scab falls off.

Recovery/Mortality Rate

Death is likely in 30 percent of all smallpox cases, usually during the first or second week of illness.

DIAGNOSIS

- Smallpox is most commonly identified by the distinctive rash it causes, although the rash can sometimes be confused initially with chicken pox.
- The smallpox lesions are painful (as opposed to chicken pox lesions) and the distribution of lesions on the body is different than chicken pox.
- Patients with smallpox are typically much sicker than those with chicken pox.
- Testing of the fluid from the lesions can confirm smallpox.

TREATMENT

- There is no way to fight the virus once patients become sick. Antibiotics are not effective.

- Patients with smallpox are isolated to prevent disease spread.
- Patients with smallpox may require supportive care, such as intravenous (IV) fluids and medication to control fever or pain.

VACCINE

There is now enough vaccine available in the SNS for every American in case of an attack.

- The vaccine contains a live virus (vaccinia) which is related to the smallpox virus but entirely different from it; it cannot give someone smallpox.
- The vaccine provides a high level of immunity from infection for 3–5 years after vaccination and decreasing immunity thereafter. It is unclear how long the vaccine provides some protection against the disease. If a person is vaccinated again later, immunity lasts even longer. However, if a person actually has had smallpox and survives, he or she then has lifelong immunity.
- The vaccine prevents disease in 95 percent of those vaccinated.
- Given within 3 days after exposure to the smallpox virus, the vaccine will prevent or significantly modify smallpox in the majority of persons. Vaccination 4–7 days after exposure likely offers some protection from disease or may modify the severity of the disease.
- The smallpox vaccine is currently not administered to the general public because the likelihood of an attack is not known, and vaccination can result in complications for some people.
- The vaccine is effective after one dose, so it could easily be given to many people if a smallpox event or outbreak takes place.
- Vaccination of only those people who might have been exposed to the smallpox virus and their contacts (ring vaccination) was used successfully in the past to eradicate smallpox. However, mass vaccination might be necessary in the aftermath of a terrorist attack.
- More information on smallpox vaccination can be found in the media reference guide at http://www.hhs.gov/emergency.

TULAREMIA

BASIC FACTS

- Tularemia is the disease caused by the bacterium *Francisella tularensis* (not a virus); it is also known as Rabbit Fever or Deer Fly Fever.
- Tularemia can spread to humans from infected animal tissue, contaminated food and water or the air.
- Tularemia is not contagious.

- There are three types of tularemia:
  - Ulceroglandular
  - Inhalational
  - Typhoidal

TULAREMIA ILLNESSES

The tularemia infection takes several forms, depending on the strength of the bacteria and how they enter the body.

Ulceroglandular

Exposure

People can contract this disease from the bite of an infected tick or fly or when an open wound comes in contact with infected meat.

Signs and Symptoms

- Signs and symptoms typically appear between 3 and 5 days, but sometimes as late as 14 days after exposure.
- Skin ulcers appear at the infection site. Lymph nodes in the area become swollen.

Recovery/Mortality Rate

The disease is treatable with antibiotics and, with treatment, fewer than 2 percent of victims die from this form of tularemia.

Inhalational

Exposure

The disease is contracted by inhaling the bacteria.

Signs and Symptoms

- Signs and symptoms typically appear within 3–5 days, but sometimes as late as 14 days after exposure.
- Early signs and symptoms include sudden fever, chills, coughing, joint pain, weakness, and headaches, similar to the flu.
- Later signs and symptoms include inflamed eyes, oral ulcers, severe pneumonia, chest pain, and respiratory failure.

Recovery/Mortality Rate

This form of the disease is treatable by antibiotics, but inhalational tularemia has a 60 percent mortality rate if untreated.

Typhoidal

Exposure

This is a secondary form of tularemia that develops after a victim has contracted inhalational tularemia.

Signs and Symptoms

- This form of tularemia attacks the circulatory system as well as the respiratory system.
- Signs and symptoms include fever, extreme exhaustion, and weight loss.

Recovery/Mortality Rate

This form of tularemia is treatable with antibiotics. The recovery rate is similar to that for inhalational tularemia.

DIAGNOSIS

All forms of tularemia are difficult to diagnose because early signs and symptoms resemble those of the cold and flu.

A rapid diagnostic test for tularemia does not exist. Chest X-ray and/or blood tests may be used.

TREATMENT

All forms of tularemia can be successfully treated with antibiotics, including streptomycin, gentamicin, or doxycycline.

VIRAL HEMORRHAGIC FEVERS

BASIC FACTS

- Viral hemorrhagic fevers (VHFs) are a class of diseases, contracted from viruses, that include:
    - Ebola
    - Marburg virus
    - Other illnesses (e.g., Lassa, Machupo)

The following are general characteristics of VHFs:

- They are naturally occurring in mosquitoes, ticks, rodents, and other animals.
- They cause massive internal and external bleeding.
- The fatality rate can be as high as 90 percent.
- With the exception of yellow fever and Argentine hemorrhagic fever, no vaccines exist.

- No drugs are available to combat the viruses that cause VHFs.

VIRAL HEMORRHAGIC FEVER ILLNESSES

Ebola

Of all the VHFs, Ebola is probably the best known due to outbreaks in Africa.

Exposure

- Ebola can be passed to humans through infected animals.
- Once a person becomes ill, the virus can be transmitted to others through exposure to blood or bodily fluids, including airborne droplets from coughing.

Signs and Symptoms

- Patients usually become sick 4–6 days after exposure.
- The disease attacks blood vessels and organs, particularly the liver, spleen, and kidneys, causing heavy bleeding.
- Signs and symptoms include fever, vomiting, diarrhea, and heavy bleeding from multiple sites.

Recovery/Mortality Rate

The fatality rates range from 50–90 percent within 1–2 weeks of illness onset.

DIAGNOSIS

- Specific laboratory tests exist to detect the virus in a blood sample, but the handling of the virus is a biohazard, so tests need to be performed in a biosafety level 4 laboratory.
- Diagnosis is usually made by monitoring signs and symptoms and by tracking a patient's exposure to the virus.

TREATMENT

- Physicians treat the patient with fluids to prevent dehydration and try to control bleeding.
- Patients and people who have had close physical contact with patients will need to be isolated and closely monitored.
- Hospital workers and caregivers must wear gowns, gloves, and masks and practice extreme caution while treating patients.

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APPENDIX C. CHEMICAL AGENTS

LESSENING THE IMPACT OF EXPOSURE FOR ALL CHEMICAL AGENTS

- Follow the instructions of emergency workers, if possible.
- Move away from the site of release (if known) during an outdoor release, or go indoors.
- Shelter-in-place if indoors near an outdoor release.
- Evacuate the affected building during an indoor release.
- If exposed, remove contaminated clothing and place in a plastic bag.
- Wash with soap and water (when appropriate).
- Flush eyes with water (when appropriate).
- Seek medical attention if you have breathed in chemical fumes or if chemicals have touched your skin.
- Patients should be decontaminated if they have chemicals on their clothes and/or skin (when appropriate).
- If medically indicated and available, get appropriate antidote(s).
- Consider using protective masks and clothing to minimize exposure.
- Whenever possible, get emergency personnel in protective gear to assist in the removal of contaminated clothing.

This section provides basic information on four major categories of chemical agents that could be used by terrorists, grouped according to how they affect the human body. These categories are:

- Blister (e.g., mustards)
- Blood (e.g., cyanides)
- Choking (e.g., chlorine)
- Nerve (e.g., sarin, VX agents)

Information on other kinds of chemicals can be found in the media reference guides at http://www.hhs.gov/emergency and at http://www.bt.cdc.gov.

Please note that neither of the media reference guides provides detailed information on toxic industrial chemicals because there are thousands that could potentially be used by terrorists. However, the public health response to a toxic industrial chemical attack or accident would be very similar to the response to an incident involving the chemicals discussed in these guides.

Please note that the descriptions of signs and symptoms in this section are not meant to be used to self-diagnose illness—they are for informational purposes only. Contact a health care provider if you suspect that you have been exposed to one of these agents or if you feel sick.

CHEMICAL AGENT QUICK REFERENCE CHART

AGENT	DESCRIPTION	FIRST SIGNS AND SYMPTOMS	FIRST ACTIONS	MEDICAL RESPONSE
Blister Agents (e.g., mustard gas, lewisite)	Group of agents that cause blistering or burns on the skin or lungs. Could be transmitted by inhaling, or contact with skin or eyes.	Skin and eye burning, coughing, severe respiratory irritation.	Leave the affected area. Immediately remove clothing, place in a plastic bag, and shower or wash. Seek medical care if exposed.	**Mustard gas:** treatment for blisters as burns, supportive care. **Lewisite:** same treatment; antidote available.
Blood Agents (e.g., cyanide, arsine)	Group of agents depriving cells and tissues of oxygen. Could be released in air, water, or food.	Rapid breathing, nausea, convulsions, loss of consciousness.	Same as for blister agents.	**Cyanide:** antidote. **Arsine:** supportive care; blood transfusions and intravenous fluids may be needed.
Choking Agents (e.g., chlorine, phosgene)	Group of agents attacking the respiratory system. Most likely to be released in air.	Coughing, burning eyes or throat, blurred vision, nausea, fluid in lungs, difficulty breathing.	Same as for blister agents.	Monitoring for delayed signs and symptoms; supportive care (e.g., oxygen as needed).
Nerve Agents (e.g., sarin, soman, tabun, VX)	Group of agents that affect the nervous system. Released in air, water, or food.	Seizures, drooling, eye irritation, sweating or twitching, blurred vision, muscle weakness.	Same as for blister agents.	Antidote; supportive care (e.g., oxygen as needed).

BASIC FACTS FOR ALL CHEMICAL AGENTS

- Chemical agents can be poisonous gases, liquids, or solids.
- Most of these agents are usually fast-acting and toxic to people, animals, or plants.
- Chemical agents can be deployed in five ways:
  - Spraying with wet or dry aerosol sprayers (e.g., crop dusters, handheld spraying devices)
  - Using a heat source to vaporize the chemical for release
  - Using an explosive device to disperse the chemical

  - Pouring the chemical on a specific site (e.g., floor, sidewalk, subway platform)
  - Contaminating food, water, or pharmaceuticals
- Weather factors (e.g., temperature, wind speed and direction, humidity, and air stability) have an impact on the effectiveness of an open-air release.
- A chemical release may result in environmental clues, including:
  - Dead plants, animals, or insects
  - Pungent odor
  - Unusual clouds, vapors, or droplets
  - Discoloration of surfaces
- Some common immediate physical signs and symptoms from an airborne attack may include:
  - Tightness in chest and difficulty breathing
  - Nausea and vomiting
  - Watery eyes, blurry vision

You may notice that specific guidance on food and water safety after a terrorist attack is not included in this guide. The effect of an attack or other public health emergency on food and water supplies is very situation specific. As a result, public health officials will provide specific information on food and water safety as needed.

BLISTER AGENTS

(Examples: mustards, lewisites/chloroarsine, phosgene oxime)

Also called vesicant agents, mustards and lewisites cause blistering on the skin after exposure. Mustard gas is the best known example. A lesser-known but possible threat is lewisite.

MUSTARD GAS

Mustard Gas Basic Facts

- Can be a colorless, oily, odorless liquid
- Can be vaporized to form a gas, if heated
- In some quantities, may have a slight garlic odor and a yellowish-to-brownish tint

Mustard Gas Illness

- Enters the body through inhalation or contact with skin or eyes.

- Causes skin damage on contact, especially on hot, humid days or in tropical climates.
- Typically, signs and symptoms do not occur immediately. It may take 2–24 hours for signs and symptoms to develop.
- Signs and symptoms include:
    - Skin burns, then blisters within a few days; blisters become large and may be yellowish-brown in color.
    - Eyes burning and swelling, which can cause blindness (lasting up to 10 days).
    - If gas is inhaled, may result in coughing, bronchitis, long-term respiratory disease, and cancer in the airways and lungs later in life.
- Exposure is usually not fatal.

INSTRUCTIONS TO SHELTER-IN-PLACE AND SEAL THE ROOM DUE TO CHEMICAL INCIDENTS

If you have been exposed:

- Remove contaminated clothing if coming from outside and seal it in a plastic bag.
- Shower and wash with soap, if possible.

To shelter-in-place and seal the room:

- Find a room with as few windows and doors as possible.
- Go to the highest level possible.
- Turn off the air conditioner, heater, and fans.
- Close the fireplace damper.
- Tape plastic over windows and doors; seal with duct tape.*
- Tape over vents and electrical outlets (and any other openings).
- Fill sinks and tubs with water.
- Turn on the radio for instructions.
- Keep a telephone handy.

*Note: Within a few hours, the plastic and tape may need to be removed to allow fresh air to enter the room to prevent suffocation. Follow the instructions of emergency workers and/or public health officials.

Mustard Gas Diagnosis and Treatment

- No effective medical test exists.
- Urine tests can be inconclusive.
- No known specific antidote or treatment exists.
- Supportive medical care is helpful.
- Blisters should be treated as burns.
- If swallowed, do not induce vomiting. Give milk to drink.

LEWISITE

Lewisite Basic Facts

- Oily liquid that can be colorless or can appear amber to black
- Smells like geraniums and could be confused with the smell of ammonia
- Can be vaporized and released into the air, or released into the water or food supply as a liquid

Lewisite Illness

- Exposure occurs by breathing in or ingesting it, or contact with skin or eyes.
- Causes immediate damage to the skin, eyes, and respiratory (breathing) tract.
- Effects are similar to those of arsenic poisoning, including stomach ailments and low blood pressure.
- Signs and symptoms include (all health information was gathered from animal studies, since there are no known cases of human exposure):

  Seconds to minutes:

  - Skin pain and irritation
  - Immediate eye irritation, pain, swelling, and tearing
  - Runny nose, sneezing, hoarseness, bloody nose, sinus pain, shortness of breath, and cough

  15–30 minutes:

  - Skin redness

  Within hours:

  - Blisters

- Diarrhea, nausea, and vomiting
- Low blood pressure or "lewisite shock"

Within days:

- Blisters form lesions

Within weeks:

- Discoloration of the skin

- Long-term health effects after prolonged exposure or in the case of exposure to high doses:
  - Skin burning
  - Chronic respiratory disease
  - Permanent blindness

Lewisite Diagnosis and Treatment

- Smell of lewisite may signal a release.
- Diagnosis is confirmed from people's signs and symptoms.
- British-Anti-Lewisite is the preferred antidote and is most effective if given immediately after exposure.
- If swallowed, do not induce vomiting or drink fluids.

BLOOD AGENTS

(Examples: arsine, cyanide)

These agents deprive the blood and organs of oxygen.

ARSINE

Arsine Basic Facts

- Colorless toxic gas
- Has a mild garlic odor that can be detected only at levels greater than those necessary to cause poisoning

Arsine Illness

- Severity of poisoning depends on the amount and duration of exposure.
- Enters the bloodstream and damages red blood cells.

- Exposure to low or moderate doses causes signs and symptoms within 2–24 hours, including:
  - Weakness
  - Fatigue
  - Headache
  - Drowsiness
  - Confusion
  - Shortness of breath
  - Rapid breathing
  - Nausea, vomiting, and/or abdominal pain
  - Red or dark urine
  - Yellow skin and eyes (jaundice)
  - Muscle cramps
- Exposure to high doses can cause:
  - Loss of consciousness
  - Convulsions
  - Paralysis
  - Respiratory failure possibly leading to death
- Long-term side effects of exposure include:
  - Kidney damage
  - Numbness and pain in the extremities
  - Memory loss or confusion

Arsine Diagnosis and Treatment

- Release is confirmed when people start exhibiting signs and symptoms.
- Only during a large release will the garlic odor be prevalent.
- No known antidote.

CYANIDE

Cyanide Basic Facts

- The following four types are most likely to be seen:
  - Hydrogen cyanide
  - Cyanogen chloride
  - Potassium cyanide
  - Sodium cyanide
- In gas form, is colorless and may have a slight almond odor
- Can be released into the air, soil, drinking water, or food supply
- Fast acting
- Evaporates quickly in open areas

Cyanide Illness

- Prevents the body's cells from using oxygen.
- Breathing and ingesting are the most harmful routes of exposure.
- Most harmful to the heart and brain which rely heavily on oxygen.
- Signs and symptoms include:
  - Rapid breathing, restlessness, dizziness, weakness, and headache
  - Nausea, vomiting, and convulsions
  - Loss of consciousness, injury to the lungs, and respiratory failure
  - Permanent heart and brain damage
  - Rapid progression to coma and death

Cyanide Diagnosis and Treatment

- Environmental testing can confirm a release.
- Blood tests can confirm individual exposure.
- Immediate medical attention is recommended.
- Preferred antidotes are a nitrite or a thiosulfate compound.

CHOKING AGENTS

(Examples: ammonia, chlorine, hydrogen chloride, phosgene, phosphine, phosporous [certain forms])

These agents attack the respiratory system, making it difficult to breathe.

CHLORINE

Chlorine Basic Facts

- Used in industry and found in bleach and other common household products.
- Can take a gas form (most likely) or a yellow-green liquid form.
- Emits a strong odor, like bleach, and can become explosive and flammable when mixed with other chemicals.
- Can be released into the air and spreads rapidly.
- Settles close to the ground.
- Liquid form can be released into the water or food supply.

Chlorine Illness

- Signs and symptoms of exposure include:
  - Coughing and tightness in the chest
  - Burning eyes, nose, and throat
  - Blurred vision, nausea, and vomiting
  - Blistered skin
  - Shortness of breath and fluid in the lungs
  - Long-term complications including pneumonia and chronic bronchitis

Chlorine Diagnosis and Treatment

- Air sampling is conducted to confirm a release.
- No known antidote exists.
- Supplemental oxygen should be given as needed.
- Immediate medical treatment is essential.
- If ingested, do not induce vomiting or drink fluids.

PHOSGENE

Phosgene Basic Facts

- Industrial chemical used to make plastics and pesticides.
- Poisonous gas at room temperature that could be released in the air.
- When cooled, is converted into liquid form.
- In a liquid release or spill, changes to gas and stays close to the ground.
- Colorless or a white or pale yellow cloud.
- In low concentrations, smells like newly mown hay.
- In high doses, has a strong unpleasant odor.
- Can cause flammable substances to burn but is not flammable itself.
- Not found naturally in the environment.
- Liquid could be released into food or water.

Phosgene Illness

- In gas or liquid form, can damage the skin, eyes, nose, throat, and lungs.
- Proximity to a release and the length of exposure determine how serious illness is.
- Signs and symptoms may occur immediately after exposure if doses are extremely high. These include:
    - Coughing
    - Burning sensation in the throat and eyes
    - Watery eyes
    - Blurred vision
    - Difficulty breathing or shortness of breath
    - Nausea and vomiting
    - With skin contact, possible development of lesions like those from frostbite or burns
    - Within 2–6 hours after exposure to high doses, possible development of fluid in the lungs (pulmonary edema)
- Exposure to low or moderate concentrations of phosgene may have few early clinical findings. Development of worsening signs and symptoms may occur 12–24 hours after the

initial exposure. Delayed signs and symptoms may surface up to 48 hours after exposure. These include:

- Difficulty breathing
- Coughing up white- to pink-tinged fluid and pulmonary edema
- Low blood pressure
- Heart failure
- Severe respiratory distress

Phosgene Diagnosis and Treatment

- No known antidote.
- Quickly moving away from the source of exposure is most important.
- Supplemental oxygen should be given as needed.
- People should be monitored for up to 48 hours for delayed signs and symptoms.
- Most people exposed recover, but high doses can result in chronic bronchitis and emphysema.
- If ingested, do not induce vomiting or drink fluids.

NERVE AGENTS

(Examples: sarin, soman, tabun, VX)

Affecting the nervous system of victims, these agents are of the greatest concern because of the low amounts needed to produce significant signs and symptoms and even death.

SARIN

Sarin Basic Facts

- Manufactured compound that is colorless, odorless, and tasteless.
- Gas or liquid form and is highly volatile and lethal.
- Absorbed through the skin or respiratory tract and causes severe respiratory damage.
- Even very small amounts can kill people.
- Vaporized sarin stays near the ground.
- Remains deadly in warm, dry temperatures but can degrade in humidity.

Sarin Illness

Signs and symptoms include:

- Difficulty breathing, tightness in chest, and respiratory arrest
- Nausea, drowsiness, vomiting, and diarrhea
- Confusion and seizures
- Drooling, runny nose, eye irritation, and tearing
- Severe muscle weakness

Sarin Diagnosis and Treatment

- With large doses, death can occur within seconds to minutes after exposure.
- Rapid recognition after a suspected attack is the key to successful treatment.
- Atropine and pralidoxime are the preferred antidotes, but must be used quickly to be effective.
- Oxygen should be administered to those having difficulty breathing.
- If ingested, do not induce vomiting or drink fluids.

SOMAN

Soman Basic Facts

- Clear, colorless, tasteless liquid that can smell fruity or like oil of camphor
- Can be heated into a vapor form

Soman Illness

- Can get sick after inhaling or absorbing it through skin or eye contact.
- Can get sick by drinking poisoned water or swimming in contaminated water.
- Can get sick by eating contaminated food.
- Signs and symptoms will appear within a few seconds after exposure to the vapor form.
- In liquid form, produces signs and symptoms within a few minutes or up to 18 hours after exposure.
- Even a tiny drop on the skin can cause sweating and muscle twitching at the site of contact.
- Low or moderate doses cause the following signs and symptoms:
    - Runny nose

  - Watery eyes
  - Small, pinpoint pupils
  - Eye pain
  - Blurred vision
  - Drooling and excessive sweating
  - Cough
  - Chest tightness
  - Rapid breathing
  - Diarrhea
  - Increased urination
  - Confusion
  - Drowsiness
  - Weakness
  - Headache
  - Nausea, vomiting, and/or abdominal pain
  - Slow or fast heart rate
  - Abnormally low or high blood pressure
- Exposure to a large dose may result in these additional health effects:
  - Loss of consciousness
  - Convulsions
  - Paralysis
  - Respiratory failure, possibly leading to death
- Vapors can be trapped on a person's clothing and can expose others.

Soman Diagnosis and Treatment

- Odor may be a signal of a release.

- Treatment with antidotes (atropine and pralidoxime) is recommended as soon as possible (ideally within minutes).
- Long-term supportive health care may be necessary.
- Mild or moderately poisoned people who are treated both rapidly and adequately usually recover completely.
- Severely exposed people or those victims who are ineffectively treated may not survive.
- If ingested, do not induce vomiting or drink fluids.

TABUN

Tabun Basic Facts

- Clear, colorless, tasteless liquid with a faint fruity odor
- Can become a vapor if heated

Tabun Illness

- Can become ill after breathing, ingesting, or through contact with skin or eyes.
- Can get sick by eating contaminated food or water.
- After exposure to vapor form, signs and symptoms should appear within a few seconds.
- Exposure to liquid form produces signs and symptoms within a few minutes or up to 18 hours later.
- Can remain active on a person's clothing, leading to exposure of others.
- A tiny drop on the skin can cause sweating and muscle twitching at the site of contact.
- People exposed to low or moderate doses may experience some or all of the following signs and symptoms within seconds to hours after exposure:
    - Runny nose
    - Watery eyes
    - Small, pinpoint pupils
    - Eye pain
    - Blurred vision
    - Drooling and excessive sweating
    - Cough

  - Chest tightness
  - Rapid breathing
  - Diarrhea
  - Increased urination
  - Confusion
  - Drowsiness
  - Weakness
  - Headache
  - Nausea, vomiting, and/or abdominal pain
    Slow or fast heart rate
  - Abnormally low or high blood pressure
- Exposure to a large dose may result in:
  - Loss of consciousness
  - Convulsions
  - Paralysis
  - Respiratory failure, possibly leading to death

Tabun Diagnosis and Treatment

- Treatment with antidotes (atropine and pralidoxime) is recommended as soon as possible.
- Other supportive health care may be necessary.
- Mild or moderately poisoned people who are treated both rapidly and adequately usually recover completely.
- Severely exposed people or those victims who are ineffectively treated may not survive.
- Repeated exposure can result in long-term damage to the body.
- If ingested, do not induce vomiting or drink fluids.

VX

VX Basic Facts

- VX is an odorless and tasteless amber-colored oily liquid that is very slow to evaporate.
- Can be heated to create a vapor form, but only in small amounts.
- The agent is stable in the environment.
- In average weather, can last on objects for days.
- In extremely cold weather, can sustain its potency for months.
- Can be a long-term hazard on surfaces.
- Considered more toxic than other nerve agents.

VX Illness

- Can ingest it, breathe it in, or come into contact with it through skin or eyes.
- Vapor form can produce signs and symptoms within seconds after exposure.
- In liquid form, produces signs and symptoms within a few minutes or up to 18 hours after exposure.
- Unless washed off immediately, liquid on the skin can be lethal.
- Even a tiny drop on the skin can cause sweating and muscle twitching at the site of contact.
- Remains potent on a person's clothing, meaning that others can be exposed.
- Within seconds or hours of moderate exposure, signs and symptoms include:
    - Runny nose
    - Watery eyes
    - Small, pinpoint pupils
    - Eye pain
    - Blurred vision
    - Drooling and excessive sweating
    - Cough
    - Chest tightness
    - Rapid breathing

  - Diarrhea
  - Increased urination
  - Confusion
  - Drowsiness
  - Weakness
  - Headache
  - Nausea, vomiting, and/or abdominal pain
  - Slow or fast heart rate
  - Abnormally low or high blood pressure
- Exposure to a large dose may cause:
  - Loss of consciousness
  - Convulsions
  - Paralysis
  - Respiratory failure possibly leading to death

VX Diagnosis and Treatment

- A release may not be easy to detect, because it has no odor.
- A release is confirmed by the signs and symptoms of those exposed.
- Atropine is the preferred antidote and must be given quickly after exposure.
- People can recover completely from mild or moderate poisoning that is both rapidly and effectively treated.
- Those exposed to large doses or those people ineffectively treated may not survive.
- Prolonged exposure can result in long-term damage to the body.
- If ingested, do not induce vomiting or drink fluids.

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APPENDIX D. RADIATION EMERGENCIES

LESSENING THE IMPACT OF EXPOSURE TO RADIOLOGICAL AND NUCLEAR AGENTS

- Follow the instructions of emergency workers, if possible.
- The most important concepts to minimize exposure are time, distance, and shielding.
  - **Time:** Decrease the amount of time spent near the radiation source.
  - **Distance:** Increase your distance from the radiation source.
  - **Shielding:** Increase the shielding between you and the radiation source. Shielding is anything that creates a barrier between people and the radiation source.
- Stay indoors and shelter-in-place to reduce exposure. Being inside a building (particularly basement), inside a vehicle, or behind a wall would provide some protection.
- Close doors and windows and shut off ventilation systems using outside air.
- If outdoors, cover mouth and nose with a scarf, handkerchief, or other type of cloth to avoid inhaling radioactive dust.
- If near the site of an attack and dust or debris is on your body or clothing, decontaminate (remove outer layer of clothing and bag it, shower without harsh scrubbing, and wash hair) before leaving to avoid spreading contamination.
- Treatment of life-threatening injuries should not be delayed in order to perform decontamination. Seek medical attention if injured by the explosion.
- Do not eat potentially contaminated foods or drink potentially contaminated water.
- Federal agencies have developed real-time models to predict how a nuclear or radiological attack would affect a given area. This information can be used to quicken response efforts and limit the number of people affected by an attack.

This section provides basic information on four types of radiation emergencies:

- Nuclear power plant attack
- Radiological dispersal device (e.g., dirty bomb)
- Improvised nuclear device (e.g., suitcase bomb)
- Nuclear weapon

Please note that the descriptions of signs and symptoms in this section are not meant to be used to self-diagnose illness—they are for informational purposes only. Contact a health care provider if you suspect that you have been exposed to one of these agents or if you feel sick.

RADIATION EMERGENCIES QUICK REFERENCE CHART

AGENT	DESCRIPTION	FIRST SIGNS AND SYMPTOMS	FIRST ACTIONS	MEDICAL RESPONSE
Nuclear Power Plant Attack	Attack on a nuclear power plant using explosives, hacking into computers, or crashing a plane into a reactor or other structures.	Radiation release unlikely—power plants are built to sustain extensive damage. Possible traumatic injuries if there is an explosion.	As a precaution, seek shelter or stay indoors if near the plant. Tune in to local radio and television for further instructions from public health authorities. Immediately seek medical care for blast injuries.	Care for blast injuries.
Radiological Dispersal Device (e.g., dirty bomb)	Dirty bomb: explosive device laced with radioactive materials. Radioactive materials may also be spread as aerosol or liquid.	Traumatic injuries caused by the explosion. Radiation sickness not likely with dirty bomb, but shrapnel could be highly radioactive.	Seek shelter or stay indoors. Immediately seek medical care for blast injuries. Cover nose and mouth with mask or cloth. If exposed, remove clothing, place in a plastic bag, and shower or wash.	Care for blast injuries. Possible decontamination if radioactive material is present.
Improvised Nuclear Device/ Nuclear Weapon	Powerful bomb involving splitting of atoms. Comes in various sizes and types, producing various levels of destruction.	Severe thermal burns, lung and ear drum damage, blindness or retinal burns, injuries from flying objects. Radiation sickness may follow.	Do not look toward the explosion. Seek shelter behind any shield or in a basement. Lie on the ground and cover your head.	Wide range of medical response depending on severity of exposure.

BASIC FACTS

The first step in understanding radiation emergencies is to draw the distinction between a **nuclear event** (like the bomb dropped on Hiroshima, Japan) and a **radiological event**, such as a nuclear power plant incident or a radiological dispersal device (e.g., dirty bomb).

NUCLEAR EVENT

- Produces a nuclear detonation involving the joining (fusion) or splitting (fission) of atoms to produce an intense pulse or wave of heat, light, air pressure, and radiation
- Highly destructive explosion that instantly devastates people and buildings because of extreme heat and impact of the blast
- Leaves large amounts of radioactivity and fallout behind

RADIOLOGICAL EVENT

- May involve explosion and release of radioactivity, but no nuclear fission.
- Typically, less radioactivity is released than in a nuclear event.

In both cases, wind direction and weather patterns can spread radioactivity beyond the immediate incident site.

RADIOACTIVE CONTAMINATION

- The deposition of radioactive material (e.g., dirt, dust, debris, liquid) on the surfaces of structures, areas, objects, or people. It can be airborne, external, or internal.

RADIATION EXPOSURE

- Exposure occurs when radiation penetrates the body and deposits its energy. For example, when a person has a chest X-ray, that person is exposed to radiation, but not contaminated.

For more details on the difference between radioactive contamination and exposure, see http://www.bt.cdc.gov/radiation/contamination.asp.

INSTRUCTIONS TO SHELTER-IN-PLACE AND SEAL THE ROOM DUE TO RADIATION EMERGENCIES

If you have been exposed:

- If coming from outside, remove outer layer of clothing and seal it in a plastic bag.
- Shower and gently wash with soap, if possible.

To shelter-in-place and seal the room:

- Find a room with as few windows and doors as possible.
- Go to the lowest level possible.
- Turn off the air conditioner, heater, and fans.
- Close the fireplace damper.
- Tape plastic over windows and doors; seal with duct tape.*
- Tape over vents and electrical outlets (and any other openings).
- Fill sinks and tubs with water.
- Turn on the radio.
- Keep a telephone handy.

*Note: Within a few hours, the plastic and tape needs to be removed and fresh air should be allowed to enter the room to prevent suffocation.
Follow the instructions of emergency workers and/or public health officials.

TYPES OF POTENTIAL EMERGENCIES

	NUCLEAR POWER PLANT ATTACK	RADIOLOGICAL DISPERSAL DEVICE (RDD)	IMPROVISED NUCLEAR DEVICE (IND)	NUCLEAR WEAPON
Type of Event	Radiological	Radiological	Nuclear	Nuclear
Examples of Radiation Dispersal	• Possible escape of radioactive material from attack on plant • Attack could include using explosives, hacking into computers, or crashing a plane into the reactor or other structures	• May be conventional explosives laced with radioactive material (e.g., dirty bomb) • Aerosols or sprays • Could include hiding radioactive material in a populated area (radiation-emitting device [RED])	Smaller nuclear weapon (e.g., suitcase bomb)	Nuclear weapon developed for strategic military purposes
Nuclear Blast	No	No	• Smaller nuclear explosion of varying size • Can be as large as the bomb dropped on Hiroshima	• Highly destructive nuclear explosion • Can be in the order of 100 times the bomb dropped on Hiroshima
Amount of Radiation Exposure	• Less than a nuclear event • Although unlikely, radioactive materials could escape/ contaminate the area and environment	• Limited • Dirty bomb blast could spread contamination around area the size of several city blocks • Exposure from a RED would depend on the size of the source and speed of detection	• Varying • May or may not include fallout	• Considerable • Creates a large fireball that would vaporize everything within it to form what is known as a “mushroom cloud.” When materials cool, they condense, form particles and fall back to earth (fallout) • Radioactive particles from the fallout could be carried long distances

	NUCLEAR POWER PLANT ATTACK	RADIOLOGICAL DISPERSAL DEVICE (RDD)	IMPROVISED NUCLEAR DEVICE (IND)	NUCLEAR WEAPON
Consequences	• Death toll could be limited • Plants are built to sustain extensive damage without releasing radioactive material • Psychological impact could be severe	• Limited death toll • In the case of a dirty bomb, initial explosion could kill or injure people in the immediate area • RED would depend on size of source, how it early it is detected and other factors • Psychological impact could be severe	• Depends on the size of the blast, whether there is fallout, and population of area • Psychological impact could be severe	• Catastrophic damage to people, buildings, and the environment • Psychological impact could be severe

You may notice that specific guidance on food and water safety after a terrorist attack is not included in this guide. The effect of an attack or other public health emergency on food and water supplies is very situation specific. As a result, public health officials will provide specific information on food and water safety as needed.

THE IMPACT OF RADIATION EMERGENCIES

RADIATION INJURIES

- Could result from the aftermath of a nuclear blast—less likely after a radiological incident.
- May not be apparent for months or years after exposure to radiation.
- The type and extent of injury may depend on:
  - The amount (dose) of radiation to which a person is exposed
  - The type of radiation (alpha, beta, gamma) to which a person is exposed (more information on this topic can be found in the media reference guide at http://www.hhs.gov/emergency)
  - Whether exposure is external (e.g., skin) versus internal (e.g., inhaled)
- Internal contamination occurs if radioactive materials are ingested or inhaled and the materials are incorporated by the body.

- If the radiation dose is large enough, victims can develop acute radiation syndrome or radiation sickness (more information is available at http://www.bt.cdc.gov/radiation/ars.asp). Signs and symptoms, not all of which develop at the same time, include:
  - Nausea
  - Vomiting
  - Diarrhea
  - Fever
  - Loss of appetite
  - Skin damage (e.g., redness, itching, swelling, blisters)
  - Seizures
  - Coma

  Signs and symptoms are nonspecific and may be indistinguishable from those of other injuries or illness.
- If radiation dose is small, no immediate health effects will be observed. In the long term, there may be an increased risk of developing cancer.
- In general, the higher the radiation dose the greater the severity of immediate health effects and the greater the possibility of long-term health effects.
- Children exposed to radiation may be more at risk than adults. Radiation exposure to unborn children is of special concern—the human embryo is very sensitive to radiation.

TREATMENT

- Many victims would likely need treatment for injuries associated with the explosion (e.g., burns, wounds).
- If contaminated, people should decontaminate themselves by removing the outer layer of clothing, placing the clothing in a bag and sealing it, taking a shower without harsh scrubbing, and washing hair. Exposure may be reduced by removing external contamination.
- Treatment for radiation sickness would depend on the severity of the signs and symptoms. Physicians will treat signs and symptoms, provide supportive care, and try to prevent infections. The worst cases may require blood transfusions and bone marrow transplants.
- There are different classes of drugs that can help:
  - Blocking agents prevent absorption of certain radioactive material in the body (e.g., Potassium iodide).

  - Decorporation agents speed up elimination of certain radioactive materials from the body (e.g., Prussian blue, diethylenetriaminepentaacetate).

  - Other drugs are used to help recovery from radiation sickness (e.g., Neupogen®).

- Potassium iodide, when taken before or soon after exposure to radioactive iodine, can protect the thyroid gland from absorbing radioactive iodine and developing thyroid cancer, but this does not help against other forms of radioactivity that may come with an attack. In addition, not all attacks will involve the release of radioactive iodine.

- There is no vaccine or drug that can make people immune to the effects of radiation.

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APPENDIX E. THE THREAT OF PANDEMIC INFLUENZA

Influenza or flu viruses routinely cause epidemics of disease every winter that can cause illness in about 10–20 percent of the population in the United States. Although these routine influenza epidemics cause an average of 36,000 deaths and 200,000 hospitalizations per year in the United States, healthy adults are usually not at high risk for complications. The groups that are at risk for complications include the very young, pregnant women, older adults, and those with chronic medical conditions. Typically, flu shots are available and effective against these types of influenza outbreaks, although persuading people most at risk to get annual vaccinations remains a challenge. Flu viruses are continually circulating around the world and mutate or change over time. This is the reason that the vaccine is updated to include current viruses each year, and that people who want to be protected against the flu need to get a new flu shot each year.

Pandemics of influenza are explosive global events in which most, if not all, persons worldwide are at risk for infection and illness. In past pandemics, influenza viruses have spread worldwide within months. With increased globalization, a new pandemic could circle the globe within weeks, or perhaps even days. Pandemic viruses have historically infected one-third or more of large populations and have led to tens of millions of deaths.

Pandemics occur when there is a major change in an influenza virus, resulting in a new strain that most of the world has never been exposed to, therefore leaving most individuals susceptible to infection. Unlike the gradual changes that occur in the influenza viruses that appear each year during flu season, a pandemic influenza virus is one that represents a major, sudden shift in the virus structure that increases its ability to cause illness in a large proportion of the population. This kind of change is called an “antigenic shift.”

There are two types of influenza viruses: type A and type B. Type A viruses can be found in many types of animals, while type B viruses circulate only among humans. While a routine epidemic can involve either type of virus, antigenic shift can only occur with type A influenza viruses. One way that an antigenic shift can occur is through pigs. Pigs can be infected with both avian and human influenza viruses. If pigs are infected with viruses from different species at the same time, it is possible for the genes of these viruses to mix and create a new virus. Humans would not have any immune protection to such a virus and could be infected in large numbers (CDC, 2004d). The rare appearance of a flu pandemic virus would likely be unaffected by currently available flu vaccines that are modified each year to match the strains of the virus that are known to be in circulation among humans around the world.

During previous influenza pandemics, large numbers of people were ill, sought medical care, were hospitalized, and died. Three major influenza pandemics occurred during the 20th century. The most deadly influenza pandemic outbreak was the 1918 Spanish flu pandemic, which caused illness in roughly 20–40 percent of the world’s population and more than 50 million deaths worldwide. Between September 1918 and April 1919, approximately 675,000 deaths from the Spanish flu occurred in the United States alone (HHS, 2004a). In 1957, the Asian flu pandemic resulted in about 70,000 deaths. The most recent influenza pandemic occurred in 1968 with the Hong Kong Flu outbreak, which resulted in nearly 34,000 deaths in the United States. Although

the virus involved in the 1968 outbreak was a dangerous virus, experts believe that fewer deaths occurred in the United States than in previous outbreaks for several reasons:

- The virus was similar to the virus that appeared in the 1957 outbreak, and some people already had immunity.
- The peak of the outbreak occurred during December when children were out of school, so the virus was not widely transmitted among school-aged children.
- Medical care and available treatments for complications had improved since the 1957 outbreak (HHS, 2004b).

Although no one can predict when the next pandemic will occur, public health scientists believe that the risk of an influenza pandemic is greater now than it has been in decades.

AVIAN INFLUENZA

One type of influenza A virus that is of concern to many public health officials is often called avian flu or bird flu. Both the 1957 and 1968 pandemics are thought to have had avian origins. Avian flu is caused by a group of influenza viruses that circulate among birds. Avian flu is highly contagious among birds, particularly domesticated birds, such as chickens. It is thought that most human cases have resulted from contact with infected birds. In the past, quarantine and depopulation (or culling) and surveillance of affected flocks have contained outbreaks. Among humans, symptoms range from conjunctivitis to a flu-like illness that includes severe respiratory distress and pneumonia. As of early 2007, there has been no evidence of sustained human-to-human transmission of avian flu, although there have been a few cases of transmission between family members. However, because influenza viruses have the potential to change and gain the ability to spread easily between people, monitoring for human infection and person-to-person transmission is important.

A growing number of people have been infected with avian flu since 1997. The first documented human case was identified in 1997 in Hong Kong. Both humans and chickens were infected. Eighteen people were known to be infected, and six died. To prevent further spread of the disease, public health authorities killed more than a million chickens. A second outbreak occurred in Hong Kong in 1999; two children were infected, and both recovered. Three outbreaks occurred during 2003. Two separate cases occurred in Hong Kong and a third outbreak occurred among poultry workers and their families in the Netherlands. Eighty-four people were infected, and one died.

Between 2004 and early 2007, more than 200 cases of avian influenza were reported in a number of countries in Asia, the Near East, Africa, and Europe. All of these cases have involved the strain called H5N1. Most of these cases are believed to have been caused by exposure to infected poultry. More than half of the people reported to be infected with H5N1 have died (HHS, 2007).

So far, the spread of H5N1 virus from person to person has been limited and has not continued beyond one person. Nonetheless, because all influenza viruses have the ability to change, scientists are concerned that H5N1 virus one day could be able to infect humans and spread easily from one person to another (HHS, 2007). An additional reason for the current heightened concern about influenza viruses is that avian influenza has become endemic in many species of

birds throughout Asia. Therefore, the threat of an avian flu pandemic is not diminishing. Scientists will need to continue to monitor avian flu epidemics carefully to make sure that they remain contained and that the virus has not transformed into a virus that can be easily transmitted from person to person.

The threat to the United States specifically is considered uncertain at this time. Although poultry imports from Asia are limited (mostly feathers or processed or cooked products, which are considered to be low risk), it is possible that, in the future, an individual infected with a new avian influenza virus that is able to spread from person to person could travel to the United States (Center for Emerging Issues, 2004).

PREPARING FOR A PANDEMIC

Prepandemic planning is essential to minimize the effects should an influenza pandemic occur. Although some of the planning activities for terrorism and other public health emergencies are relevant to an influenza pandemic (e.g., strengthening surveillance systems), planning is also underway that is more specific to influenza. HHS' current Pandemic Influenza Plan (http://www.pandemicflu.gov) provides guidance to national, state, and local policymakers and health departments for public health preparation and response in the event of a pandemic influenza outbreak. Pandemicflu.gov is also the primary Web site portal to a variety of resources for governments at all levels, individuals and families, businesses, health care providers, and community organizations.

At the federal level, health officials are also conducting a number of other activities in preparation for the next pandemic, including international surveillance activities, vaccine development and research, and antiviral drug stockpiling and research. Among other activities, resources are being allocated to expand vaccine production as needed and add influenza antiviral drugs to the Strategic National Stockpile (SNS). Research is also being conducted on new influenza vaccines, more effective antiviral drugs, and ways to rapidly sequence the genes of influenza viruses.

If a pandemic were to occur, the federal response activities would depend, to an extent, on the stage of the pandemic. For example, the activities would be different if scientists discover a new influenza strain in one person in another country than if a number of people in the United States were ill with a new strain of influenza. The kinds of activities in which the federal government might be involved include:

- National and international surveillance to identify people who have the virus and where outbreaks are occurring
- Rapid development, licensure, and production of new vaccines
- Implementing programs to distribute and administer vaccine
- Determining how antiviral drugs could be used to combat the current flu strain and target drug supplies
- Implementing control measures to decrease the spread of the disease (e.g., infection control in hospitals, screening travelers from affected areas)

- Communicating with the public, health care providers, community leaders, and the media about the status of the pandemic and the response

States have developed their own plans to deal with the local aspects of planning for and response to a potential influenza pandemic. Some examples of what these plans include are the state and local perspective on:

- Surveillance activities
- Vaccine management (distribution and administration)
- How to acquire and use antiviral agents
- How to implement community control measures (e.g., school closings, isolation and quarantine)
- Emergency response (e.g., delivery of medical care, maintenance of essential community services)

Local preparedness will be an essential determinant of how communities do in the early months of a pandemic. Communities are encouraged to plan now for the crucial period when a pandemic has struck, but when there are not yet adequate supplies of vaccines or antivirals. The following tasks should be considered by communities in this process:

- Reducing social contact to slow the spread of the virus
- Treating those who become ill
- Sustaining civic life in the face of greatly increased morbidity, mortality, and fear

Examples of the many issues a community should consider are: how to use volunteers, especially people who have recovered and are, therefore, immune; how to educate children if schools were closed; and how essential businesses would operate.

SOME DIFFERENCES BETWEEN TYPICAL INFLUENZA OUTBREAKS AND PANDEMIC INFLUENZA OUTBREAKS

TYPICAL INFLUENZA	PANDEMIC INFLUENZA
Yearly occurrence.	Rare occurrence (last one was in 1968).
Virus undergoes gradual change from previous years.	Major, sudden shift in virus structure (antigenic shift).
Previous exposure to similar viruses may provide some protection.	Little or no previous exposure in the population to similar viruses.
Healthy adults usually not at high risk for complications.	Entire population may be at risk for complications.
Vaccines may be developed in advance to combat the virus.	Vaccines cannot be developed until virus strain appears. Some antiviral medications may be effective.
Approximately 5–20 percent of Americans get the flu each year and approximately 36,000 die from the disease.	Percentages of the population that would be infected by a pandemic influenza virus and die from it are hard to predict ahead of time but would be significantly higher than a typical flu season.
Symptoms include fever, cough, runny nose, and muscle pain.	Symptoms could be more severe, including shortness of breath, acute respiratory distress, pneumonia, and organ failure.

More detail on federal and state preparedness and response activities, as well as information on all aspects of pandemic flu and avian influenza, can be found at http://www.pandemicflu.gov.

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APPENDIX F. DISASTER SUPPLIES KIT

There are six basics that you should stock for your home: water, food, first aid kit, clothing and bedding, tools and emergency supplies, and special items. Keep the items that you would most likely need during an evacuation in an easy-to-carry container—suggested items are marked with an asterisk (*) in the list below. Possible containers include a large, covered trash container; a camping backpack; or duffel bag.

WATER

Store water in plastic containers, such as soft drink bottles. Avoid using containers that will decompose or break, such as milk cartons or glass bottles. A normally active person needs to drink at least 2 quarts of water each day. Hot environments and intense physical activity can double that amount. Children, nursing mothers, and ill people will need more.

- Store 1 gallon of water per person per day. (2 quarts for drinking, 2 quarts for each person in your household for food preparation/sanitation).*
- Keep at least a 3-day supply of water per person.

*FOOD**

Store at least a 3-day supply of nonperishable food. Select foods that require no refrigeration, preparation, or cooking and little or no water. If you must heat food, pack a can of portable cooking fuel, such as Sterno. Select food items that are compact and lightweight. Include a selection of the following foods in your disaster supplies kit:

- Ready-to-eat canned meats, fruits, and vegetables
- Canned juices
- Staples (salt, sugar, pepper, spices, etc.)
- High energy foods
- Vitamins
- Food for infants and elderly
- Comfort/stress foods

*FIRST AID KIT**

Assemble a first aid kit for your home and one for each car.

- Twenty adhesive bandages, various sizes
- One 5" x 9" sterile dressing
- One conforming roller gauze bandage

- Two triangular bandages
- Two 3" x 3" sterile gauze pads
- Two 4" x 4" sterile gauze pads
- One roll 3" cohesive bandage
- Two germicidal hand wipes or waterless alcohol-based hand sanitizer
- Six antiseptic wipes
- Two pairs of large medical grade nonlatex gloves
- Adhesive tape, 2" width
- Antibacterial ointment
- Cold pack
- Scissors (small, personal)
- Tweezers
- Cardiopulmonary resuscitation (CPR) breathing barrier, such as a face shield

NONPRESCRIPTION DRUGS

- Aspirin or nonaspirin pain reliever
- Antidiarrhea medication
- Antacid (for stomach upset)
- Syrup of Ipecac (use to induce vomiting, if advised by the Poison Control Center)
- Laxative
- Activated charcoal (use if advised by the Poison Control Center)

CLOTHING AND BEDDING

Include at least one complete change of clothing and footwear per person.*

- Sturdy shoes or work boots*
- Rain gear*
- Blankets or sleeping bags*
- Hat and gloves
- Thermal underwear

- Sunglasses

TOOLS AND EMERGENCY SUPPLIES

- Mess kits, or paper cups and plates, and plastic utensils*
- Emergency preparedness manual*
- Battery-operated radio and extra batteries*
- Flashlight and extra batteries*
- Cash or traveler's checks and change*
- Nonelectric can opener and utility knife*
- Fire extinguisher: small canister ABC type
- Tube tent
- Pliers
- Tape
- Compass
- Matches in a waterproof container
- Aluminum foil
- Plastic storage containers
- Signal flare
- Paper and pencil
- Needles and thread
- Medicine dropper
- Shutoff wrench (to turn off household gas and water)
- Whistle
- Plastic sheeting
- Map of the area (for locating shelters)

SANITATION

- Toilet paper and towelettes*
- Soap and liquid detergent*

- Feminine supplies*
- Personal hygiene items*
- Plastic garbage bags and ties (for personal sanitation uses)
- Plastic bucket with tight lid
- Disinfectant
- Household chlorine bleach (may also be used for purifying drinking water—see http://www.redcross.org for instructions)

SPECIAL ITEMS

Remember family members with special requirements, such as infants and elderly or disabled persons.

FOR BABY*

- Formula
- Diapers
- Bottles
- Powdered milk
- Medications

FOR ADULTS*

- Heart and high blood pressure medication
- Insulin
- Prescription drugs
- Denture needs
- Contact lenses and supplies
- Extra eyeglasses

ENTERTAINMENT

- Games, playing cards, and books

IMPORTANT FAMILY DOCUMENTS

Keep these records in a waterproof, portable container:

- Will, insurance policies, contracts, deeds, stocks and bonds

- Passports, social security cards, immunization records
- Bank account numbers
- Credit card account numbers and companies
- Inventory of valuable household goods and important telephone numbers
- Family records (birth, marriage, and death certificates)

STORAGE

- Store your kit in a convenient place known to all family members. Keep a smaller version of the supplies kit in the trunk of your car.
- Keep items in airtight plastic bags. Change your stored water supply every 6 months so it stays fresh. Also, replace your stored food every 6 months. Rethink your kit and family needs at least once a year. Replace batteries, update clothes, etc.
- Ask your physician or pharmacist about storing prescription medications.

Based on the "Your Family Disaster Supplies Kit" developed by the Federal Emergency Management Agency (http://www.fema.gov) and the American Red Cross (http://www.redcross.org). Additional supply checklists can also be found at http://www.ready.gov, http://www.redcross.org/preparedness/cdc_english/home.asp and http://www.bt.cdc.gov/.

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