TERRORISM PREPAREDNESS:

FEDERAL MEDICAL RESPONSE PROGRAMS AND THE HEALTH WORKFORCE

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Executive Summary

Since the terrorism attacks of September 11, 2001, the United States has been engaged in monumental efforts to develop more effective terrorism prevention and response programs. The President and Congress embraced homeland security as the highest national priority. Substantial funding has been authorized, existing programs have been reorganized, and a new Cabinet-level Department of Homeland Security (DHS) has been created. The President, through the Office of Homeland Security, released the National Strategy for Homeland Security (Strategy) in July 2002, which has served as the blueprint for the Nation’s efforts to develop comprehensive terrorism deterrence and response programs.

Yet it is a widely held consensus that the U.S. remains susceptible to terrorist attacks incorporating a variety of agents and weapons. This situation exists despite extensive efforts to reduce the threat of terrorism and, specifically, to reduce U.S. domestic vulnerability. This susceptibility to attack makes the nation’s medical disaster response system extremely critical. Rapid and effective medical response may impact on the immediate casualties resulting from an attack or disaster. The National Strategy area that most directly engages health and medical systems is the “emergency preparedness and response” mission, which addresses steps to minimize the damage and casualties from attacks and assist with recovery efforts.

The federal emergency medical response to September 11 attacks involved two emergency response systems, the National Disaster Medical System (NDMS) and the Metropolitan Medical Response System (MMRS). These systems remain the core medical response systems for any future terrorist attacks and provide a critical infrastructure and organizational plans for national and local preparedness strategy and efforts. In March 2003, these programs were transferred from the Department of Health and Human Services (HHS) to the DHS, although ongoing involvement of HHS is expected to continue.

The NDMS, established in 1984, was designed as a cooperative program to assist with large numbers of casualties from disasters or terrorism attacks or overflows of military casualties. Key participants in the NDMS are four federal agencies, private sector hospitals, and volunteers organized into about 100 response teams. The NDMS has three functions: 1) to support deployable on-site emergency medical response teams; 2) to secure safe transport of casualties to care destinations; and 3) to maintain voluntary hospital capacity to provide definitive medical care for casualties. The medical response teams include several categories of specialty teams: the largest in number are the 53 locally sponsored Disaster Medical Assistance Teams (DMATs), which have trained health and medical personnel that can be deployed to provide emergent casualty care.

The MMRS supports the coordination of local responders within each of the largest 122 metropolitan areas. This initiative is guided by the expectation that terrorist attacks will be aimed at targets within larger cities. Under the MMRS program, each city must develop a coordinated response plan that brings together fire, police, emergency medical services, hospitals, public health, and state and other relevant stakeholders.

This study took a broad approach to understanding terrorism preparedness. This report begins with a review of federal policy for disaster and terrorism preparedness. Next, the two core
national emergency medical response systems and the health professional involvement with the programs are described. This is followed by a brief review of terrorism preparedness training for first responders and health professionals. The final section discusses key findings.

Key Findings

The key findings of this study are organized under four broad headings: improving planning and coordination, integrating with the medical care system, workforce preparation and readiness, and program evaluation. Additional information on each finding is provided in the following chapters.

1) Improving planning and coordination

Comprehensive and coordinated planning to organize the Nation’s response systems to deal with future terrorism attacks is still in an active developmental phase. The time frame required for full readiness has been estimated at five to ten years, assuming continued financial and other priority support. The overall demands facing the DHS are immense, with a first responsibility to prevent future attacks. Currently, the DHS and HHS, as well as other federal, state, and local, public and private groups, have ongoing programs and efforts to support the emergency medical response and preparedness mission.

Despite having the framework in place for a medical response system (organized under the NDMS) and metropolitan response systems (122 cities under the MMRS) there is need for greater coordination and other efforts to truly create response “systems”. Issues to consider are discussed in Chapters 2 and 4, with selected examples listed below.

- High-risk, large metropolitan areas would be better able to direct and provide casualty care and triage in the first few hours after a massive casualty attack if they had a well trained local disaster medical response team. Since many large cities do not have such teams, the immediate triage and management critical to saving lives in major disasters may not be available.
- Yet these same large cities are likely to have the organizational and personnel resources, such as large health care systems, academic health centers (AHCs), and Veteran’s Administration (VA) Hospitals, which could play a key role in supporting new team development. These institutions would reap a benefit if their interested staff and faculty joined the teams. These individuals could provide their institutions with local expertise and skills that also could be tapped for the educational programs on emergency response for AHC or VA trainees and health professions students.
- The National Strategy and many other analyses have called for greater coordination and integration of federal agency programs that are directed toward terrorism preparedness. There are opportunities for greater linkages to be developed between the NDMS and MMRS components at the local metropolitan and regional levels, which would establish stronger “response systems”.

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Hindsight has revealed a lack of coordination among the federal programs involved with training and preparing first responders, the first personnel groups trained in terrorism preparedness. Current and future planning for new health and medical personnel training programs could place a priority on coordination of various aspects of the training process, where appropriate, to avoid problems found with earlier efforts. Since new training funds are flowing through federal and state agencies, it seems that the sharing of plans and strategies among all relevant parties could be a first step toward encouraging coordination.

2) Integrating the health and medical care systems and health professionals with preparedness planning and implementation

The nation’s preparedness efforts can be strengthened by securing support and engagement from the health and medical care leaders such as the leaders of the nation’s academic health centers (AHCs), major hospitals and health care systems, and professional associations. It is not clear how this issue is currently being considered or what opportunities have been created to involve these and other leaders with preparedness planning and implementation. Many health care leaders and practitioners demonstrated their desire to help respond to the immediate crisis of September 11. These individuals have since worked to become better informed and more involved with terrorism preparedness (e.g., education programs, analyses of their professional or institutional roles, etc). Yet without a strategy for ongoing meaningful engagement, such leadership and staff level commitments can quickly fade.

Disaster preparedness training not only can help in responding to terrorism-caused causalities, but also to causalities resulting from man-made and natural disasters and emerging infectious disease outbreaks (such as the SARS respiratory outbreaks or the West Nile virus, etc). This is the “dual-purpose” strategy, which recognizes that strengthening homeland security can also address other pressing threats and problems. For example, enhanced bioterrorism preparedness can strengthen the public health and medical response to emerging infectious diseases.

There has been limited contact between the disaster medical response systems and personnel within local health care systems and practicing health professionals (other than EMS personnel). Efforts have begun to change this, including programs such as the Medical Reserve Corps, the new special NDMS teams for nurses and pharmacists, hospital and public health preparedness programs, bioterrorism education preparedness for physicians and others, and other activities.

It is beyond the scope of this project to fully explore options to engage health professional leaders and practitioners, although some of the relevant issues and strategies are discussed in Chapter 4.

3) Readiness of the health workforce

Establishing and sustaining a well-trained health workforce that can respond to emergencies and disasters requires national attention and strategic planning and monitoring. There is a need to expand emergency medical response training programs, but the educational task is
mammoth and costly. Another issue to be considered is how to develop a larger number of health professionals that can serve as the leaders and experts in the field of disaster and terrorism preparedness and response. Approaches for this that focus on specific professions and individuals are discussed in Chapter 4.

At the national level, there needs to be discussion and thinking about a long-term strategy to plan for various levels of disaster-response competency and responsibility among the broad health workforce. Currently, there is no national advisory or oversight body charged with this responsibility. This may be an issue that could be addressed jointly by DHS and HHS. A well-constituted advisory group with an appropriate charge and sufficient staffing support could serve as a focal point for considering options and advising on a long-term strategy for health workforce terrorism preparedness. Membership could include leaders from the private health care and professional education sectors, representatives of major health and medical professions, experts involved with terrorism preparedness, and key federal and state agency leaders.

Training programs have a history of developing in isolation from one another, although positive signs have been seen in the creation of some disaster and terrorism educational consortia and collaboratives. Looking forward, some of the most important needs include gaining efficiency with the training process and conducting evaluations to be sure that the training is actually having the desired effect on the target audiences. Sharing proven educational resources could reduce development costs. Support for a multidisciplinary collaborative or multidisciplinary conferences that would bring together health professional groups, educators, with those in the disaster preparedness field (e.g., NDMS, MMRS, Department of Defense [DoD], Centers for Disease Control and Prevention [CDC], DHS staff and others) could be very useful.

4) Program evaluation

Several groups have called for evaluations of the two major disaster medical response system programs (NDMS and MMRS). These are cited in the report. The General Accounting Office (GAO) has called for performance and outcomes based goals that can be used to assess terrorism preparedness programs. The Institute of Medicine, which has substantial experience with terrorism related studies, has suggested one specific approach to assessing the MMRS. As noted, evaluation of terrorism preparedness training programs is also needed, particularly in light of the substantial and long-term investment needed for these programs.

These findings and recommendations present a mixed state of affairs. Much needs to be done to correct weaknesses in the current disaster medical response system, but the nation does have an existing medical response system, there is a commitment to improving that system, and the experience and research of recent years provide the insight needed to guide improvement. It will take significant resources and effective administration, but the process of strengthening the nation’s medical response system is underway.
INTRODUCTION

Since the terrorist attacks of September 11, 2001, the United States has been engaged in efforts to develop more effective terrorism prevention and response programs. The President and Congress have embraced homeland security as a national priority. Substantial funding has been authorized, existing programs have been reorganized, and a new Cabinet-level Department of Homeland Security (DHS) has been created. Yet it is a widely held consensus that the U.S. remains susceptible to terrorist attacks. This exposure exists despite extensive efforts to reduce the global threat of terrorism and to specifically reduce U.S. domestic vulnerability.

This susceptibility to attack makes the nation’s disaster response system all the more critical. Rapid and effective medical response can make the difference between having many or few casualties as the result of an attack or disaster. The system for national disaster medical response that was in place at the time of the 2001 attacks was under the overall leadership of the Federal Emergency Management Agency (FEMA), with responsibility for public health and medical services response residing under the direct control of the Secretary of the Department of Health and Human Services (HHS). On September 11, 2001, HHS Secretary Thompson activated the full National Disaster Medical System for the first time ever, sending in trained disaster medical response personnel, activating the hospital reserve system, transporting medical emergency supplies, and supporting City and State disaster response programs. Follow-up responses to assist at the attack sites included providing support for mental health services, mortuary teams and victim identification efforts, and assistance with arranging services for citizens whose medical care was disrupted by the disaster.

The following federal medical response programs were activated on September 11 2001:

- The National Disaster Medical System (NDMS), which provides and coordinates the medical and hospital care reserve capacity for mass casualties, including transport to a network of voluntarily cooperating hospitals. Rapid response medical assistance teams such as the Disaster Medical Assistance Teams (DMATs), which are part of the NDMS. These teams can be deployed to provide on-site, emergent, multidisciplinary care for casualties resulting from a variety of different types of disasters.

- The Metropolitan Medical Response System (MMRS), which supports medical response efforts in the 122 largest U.S. cities. The MMRS program assists in the local coordination of the public safety sector (police, fire departments), emergency medical services, hospitals, and public health agencies to optimize the response to large-scale disasters.

These two systems remain the core of the federal medical response program for a terrorist attack. These systems had reported to HHS; they were transferred to the Department of Homeland Se-

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curity (DHS) in March 2003.

On September 11, the President and Congress recognized the vulnerability to terrorism and its consequences and initiated sweeping policy responses. Within days, Congress appropriated $40 billion in emergency funding for disaster assistance, recovery efforts, anti-terrorism initiatives, national defense, and related programs. As the October 2001 anthrax outbreaks unfolded, Congress recognized the critical need to strengthen the public health infrastructure. In June 2002, Congress passed a comprehensive bioterrorism bill, the Public Health Security and Bioterrorism Preparedness and Response Act of 2002. The Act laid out a national preparedness plan and provided for specific involvement for the health and medical care sector and for health professionals.

The overall master plan for preventing and responding to terrorist attacks, released by the President in July 2002, is the National Strategy for Homeland Security. The Strategy represents current federal policy and provides a framework for homeland security. The National Strategy has three goals:

- Prevent terrorist attacks within the United States;
- Reduce America’s vulnerability to terrorism; and
- Minimize the damage from attacks that do occur.

The first two goals have begun to be addressed by federal initiatives such as:

- the global war against terrorism,
- criminal justice and intelligence agency efforts to contain and prosecute terrorism,
- investments in border security, aviation and transportation security,
- enhanced protection of physical infrastructures, energy sources, other vital assets,
- protection of cyberspace and communications systems, and
- many other prevention and deterrence efforts.

The third strategic goal—minimizing the damage from attacks that do occur—includes the topics covered in this study, namely the emergency preparedness and medical response programs that would be activated in the event of a terrorist attack or other disaster, providing care to casualties, at-risk individuals, and communities.

The NDMS and MMRS programs provide the framework for a preparedness network. Prior to 2001, these systems were considered to be underdeveloped and inadequately prepared to address major mass casualty or bioterrorism events. How much has that changed over the last two years? Despite the substantial financial and policy support directed at terrorism preparedness since 2001, there have been only limited reported assessments of these systems.

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3 Bush, G.W. President releases national strategy for homeland security, 2002.
A Study of the Federal Disaster Medical Response Programs and the Health Workforce

The purpose of this study was to examine the national disaster medical response systems (NDMS and MMRS) and health workforce related to these systems. The study focuses on the medical and health component of the systems, with special attention directed at policy responses to improve the nations emergency preparedness in the wake of the September 11th attacks and the October 2001 anthrax outbreaks.

The study is based on information drawn from published analyses, studies, reports, professional articles, Internet-based resources, training guides, public testimony, news articles, and various other printed and Web-based information, along with a limited number of key informant interviews conducted to clarify specific issues and provide an overall perspective.

The primary author, aided by a small group of colleagues and research assistants, conducted the analysis and writing. Experts in the field reviewed the major findings. A major challenge for the study was the complexity and distinctive characteristics of the field of terrorism preparedness and the relatively sparse overlap with other health policy and health workforce research.

The report includes the following sections:

- An executive summary with key findings and recommendations
- An overview of federal policy related to disaster preparedness and a description of the 2002 National Strategy for Homeland Security;
- An overview of the two medical response systems, the National Disaster Medical System, including the Disaster Medical Assistance Teams, and the Metropolitan Medical Response System;
- A description of selected training programs for the healthcare personnel in emergency preparedness.
- A summary of key findings.

Appendices that provide more detailed information on the topics covered in each chapter appear at the end of the chapter. The original research proposal was submitted about September 20 2001 and an addendum extended the overall study period into 2003 to allow for coverage of the transfer of medical response programs into the Department of Homeland Security in early 2003. Thus the research presented in this report reviewed information available from September 2001 through about June 2003.
CHAPTER 1. FEDERAL TERRORISM RESPONSE PREPAREDNESS POLICY AND PLANNING

“It is inherently impossible to defend our nation against all conceivable terrorist threats. Our society is far too open, and too dependent on interconnected infrastructure and advanced technologies for such a goal to be feasible.”

--National Research Council, 2002

There have been large-scale disasters throughout human history. For most of that history such disasters resulted from natural occurrences such as earthquakes, floods, volcanic eruptions, and disease pandemics or from man made disaster through war. More recently the human role in causing disasters has expanded, through unintentional disasters resulting from manmade hazards such as chemicals (Bhopal), radiation (Chernobyl), or high-speed travel (jumbo jet crashes). Most recently, human-caused disasters have been further expanded to include intentional acts of destruction, such as the 1995 Oklahoma City bombing and the September 11, 2001 terrorist attacks.

Modern day terrorism is particularly threatening in part because of the availability of advanced technology (chemical, biological, and/or nuclear) to cause widespread death and destruction. Other goals of terrorism include the disruption of critical infrastructures and the creation of widespread fear and societal chaos.

Throughout history, humans have responded to large-scale disasters as best they could, primarily through warnings, flight, quarantine, improved construction, and medical treatment. Such responses have evolved over time based on the lessons of the most recent disasters. As technology has advanced over time, both disaster causes and disaster responses have also advanced. This is certainly happening now as efforts are made to both prevent and respond to today’s heightened threats. Experts agree, however, that no matter how rigorous the preventive measures, some disasters will occur. Thus it is imperative that society be prepared to respond quickly and effectively in order to minimize the consequences of large-scale disasters. Two recent examples of disaster responses to disasters in Baltimore and Oklahoma City are described in Appendix 1.1 at the end of this chapter.

Principles and Policy Concepts for Emergency Response

One of the early principles for disaster response planning in this country was that an initial or frontline response would come from the local jurisdiction, usually with “first responder” units such as police, fire, ambulance, and emergency medical services personnel. Many counties and

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local governments in the United States have emergency management systems (EMS) in place. As defined in the Institute of Medicine’s *Preparing for Terrorism*, an EMS involves:

“… organized analysis, planning, decision-making, and assignment of available resources to mitigate (lessen the effect of or prevent), prepare for, respond to, and recover from the effects of all hazards. The goal of emergency management is to save lives, prevent injuries, and protect property and the environment if an emergency occurs.”

In case of a major disaster such as a terrorist attack, the medical first responders are also considered to include health personnel, such as physicians, nurses, pharmacists, therapists, and others drawn from health departments, hospitals and their emergency departments, private medical offices, and elsewhere.

Federal policy guiding responses to terrorism events have been based on a framework developed for responding to naturally occurring disasters or man-made hazards. A key concept is that local personnel using available local resources will provide the first response.

Coordinated disaster policy is built upon the principle that when an event overwhelms local responder capacity, neighboring jurisdictions will be called upon for help (often guided by existing “mutual aid” agreements). If still further assistance is needed, relevant state agencies will be asked to join the response effort. The Institute of Medicine’s report on *Preparing for Terrorism* explains that:

“Local jurisdictions request state assistance to obtain specialized resources, to supplement local resources, or to act as a financial or operational conduit to federal resources. State governors have the legal responsibility to carry out emergency preparedness, response, and recovery actions; and declaration of an emergency provides him or her with additional powers. These powers include the authority to mobilize the National Guard, to order an evacuation, to command and use private property (within prescribed limits), to use emergency funds, and to enter into mutual-aid agreements with other states.”

From the 1970s through the 1990s federal legislation strengthened response systems through establishing regional emergency response services, local trauma care systems and training, and also mandating federal coordination of disaster relief. A chronology of major federal policy for disaster and terrorism response, from 1970 through 2000 is listed in Appendix 1.2. A review of these federal policy initiatives shows that specific policy development frequently followed the occurrence of a crisis or disaster, addressing the problems that surfaced during that particular crisis or disaster.

For a large-scale disaster, federal assistance could be requested through the Federal

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5 Institute of Medicine, *Preparing for Terrorism*, 2002, p. 34.

Emergency Management Agency (FEMA). FEMA was created in 1979 with a mission to “reduce loss of life and property and protect our nation’s critical infrastructure from all types of hazards through a comprehensive, risk-based, emergency management program of mitigation, preparedness, response, and recovery.” FEMA was an independent agency, reporting to the President and responsible for coordinating federal agencies and programs that could assist state and local units during disasters.

All states are required to have a state level emergency management agency (EMA), with high-level reporting within the state (e.g. to the governor or senior staff) and a defined relationship with FEMA. With a disaster so severe as to be beyond the response capacity of state and local governments, FEMA assistance can be requested by the governor or president. FEMA assistance is requested numerous times each year to help respond to major natural or man-made disasters (e.g. floods, hurricanes, tornadoes, forest fires).

In 1992, a comprehensive federal plan was developed to address the challenges of coordinating the federal agencies that had a role in responding to disasters. The Federal Response Plan (FRP) was intended to clearly identify, organize, and assign authority for the federal response and it clearly outlines the procedures and structures for delivering federal disaster assistance. The FRP identified 12 diverse emergency support functions and assigned a lead federal agency for each function, with overall leadership assigned to FEMA (see Table 1).

Table 1 The Federal Response Plan: Emergency Support Functions and Lead Agencies (1992, revised 1999)

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<tr>
<th>Emergency Support Function</th>
<th>Lead Agency</th>
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<td>1. Transportation</td>
<td>Department of Transportation (DoT)</td>
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<tr>
<td>2. Communications</td>
<td>National Communication System</td>
</tr>
<tr>
<td>3. Public works/engineering</td>
<td>US Army Corps of Engineers</td>
</tr>
<tr>
<td>4. Fire fighting</td>
<td>Department of Agriculture (DoA)</td>
</tr>
<tr>
<td>5. Information/planning</td>
<td>Federal Emergency Management Agency (FEMA)</td>
</tr>
<tr>
<td>6. Mass care</td>
<td>American Red Cross (ARC)</td>
</tr>
<tr>
<td>7. Resource support</td>
<td>US General Services Administration (GSA)</td>
</tr>
<tr>
<td>8. Health and medical services</td>
<td>Department of Health and Human Services (HHS)</td>
</tr>
<tr>
<td>9. Urban search and rescue</td>
<td>FEMA</td>
</tr>
<tr>
<td>10. Hazardous material</td>
<td>Environmental Protection Agency (EPA)</td>
</tr>
<tr>
<td>11. Food</td>
<td>Department of Agriculture</td>
</tr>
<tr>
<td>12. Energy</td>
<td>Department of Energy (DoE)</td>
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</table>

Beginning in the mid-1990s, federal and private sector experts voiced concern about U.S. threats and vulnerability to attacks on our homeland (domestic territory) from “weapons of mass destruction” (WMD). WMD attacks involve the intentional use of agents or force that could cause high numbers of casualties, destruction of physical structures and vital infrastructures, and create substantial disruptions in essential societal functions. To address this concern, in 1999 the FRP was revised to specifically include terrorism response planning, with FEMA remaining the lead unit.\(^8\) FEMA carried out this role throughout the 2001 attacks and the ensuing months. As described below, in March 2003, FEMA was transferred to the Department of Homeland Security.

The federal disaster policy expressed by the executive branch that emerged during the last half of the 1990s focused on deterrence of attacks, the protection of infrastructure, and the training and equipping of personnel that would respond to attacks. For example, Presidential Decision Directive (PDD) 39 in 1995 “assigned the Department of Justice, through the Federal Bureau of Investigation, responsibility as the lead federal agency for crisis management, and the Federal Emergency Management Agency responsibility for consequence management of domestic terrorist incidents.”\(^9\) Additional executive efforts to address key terrorism threats included PDD 62, issued in 1998, to establish a National Coordinator for Security, Infrastructure Protection and Counterterrorism position within the National Security Council (NSC) and also, in 1998, PDD 63 which addressed information infrastructures, Internet security, telecommunications, and cyber terrorism. PDD 62 also allowed for the designation of National Special Security Events (high-visibility events that might be targets for terrorism) whereby contingency planning and on-site agency staffing and protection could be carried out.

One of the most important pieces of legislation to be enacted during this period was the Nunn-Lugar-Dominici Defense Against Weapons of Mass Destruction Act of 1996, Public Law (PL) 104-201 and 1997 Amendments. This legislation included provisions for:

- The training of emergency management and first responder personnel;
- Providing equipment for local units, such as personal protective equipment (PPE), decontamination equipment and technologies, and early detection devices for hazardous agents;
- Organizing response groups in metropolitan areas to improve disaster-response coordination;
- Technical assistance for tasks such as local needs or threat assessment, developing local response plans, and training on how to use equipment;
- Planning a limited number of large-scale disaster exercises, as well as some smaller scale (table top) training exercises.

Several appointed groups were asked to review the threat level for WMD attacks and to


assess the Nation’s preparedness to deter or respond to the threats. In 1999, Congress established the Advisory Panel to Assess Domestic Response Capabilities for Terrorism Involving Weapons of Mass Destruction (the Gilmore Commission or Panel, named after the chairman). The Commission was instructed to conduct a study of the country’s preparedness for attacks on U.S. lands and the country’s domestic response capabilities. The Commission issued several annual reports.

- The first report, in 1999, concluded that an attack was likely, that it was not possible to describe the type of attack or agent most likely to be used, and that, therefore, the Nation “must be prepared for the entire spectrum of potential terrorist threats.”  

- The second report, in 2000, found major weaknesses in response capabilities. “While the advisory panel found much to commend, it also found problems at all levels of government and in virtually every functional discipline relevant to combating terrorism.”  

- The third report, in 2001, included a brief discussion of the nation’s health and medical systems, which were found to be “under prepared to address the full scope of potential terrorist attacks.”  

In 2000 the Congress directed the General Accounting Office (GAO) to conduct a study of “the strategies, policies, and programs to combat domestic terrorism, particularly domestic terrorism involving weapons of mass destruction.” The GAO report was released on September 20, 2001. The transmittal letter from the Comptroller General noted, “Given the tragic events of September 11, it is clear that combating terrorism efforts are now at the top of the national agenda. … While this report is a dispassionate and analytical discussion of the progress made and the challenges faced by the federal government and the nation, we recognize the terrible cost of terrorism in human terms.”

This landmark 400-page report pointed out federal program duplications, lack of sufficient leadership authority and agency coordination, and overlap of many functions among federal agencies. The key findings of this study were:

- Overall leadership and coordination need to be addressed;
- Limited progress has been made in developing a national strategy and related guidance and plans;
- Federal response capabilities have improved but further action could be taken;

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• Federal assistance to state and local governments can be consolidated; and
• There has been only limited progress in implementing a strategy to counter computer-based threats.

The three principal recommendations of this GAO study addressed 1) the need for a single point of leadership, authority, and responsibility for coordination of all federal programs to combat terrorism; 2) the need to develop a process to evaluate lessons from experiences and exercises to combat terrorism; and 3) the need to consolidate specific programs of assistance to state and local governments. As will be described below, these recommendations were carried out by subsequent executive and legislative policy actions.

In another major report, the GAO assessed medical response issues related to terrorism.\textsuperscript{14} The GAO noted that several federal agencies sponsored training for first responders in states and metropolitan areas, but that this was done with limited coordination among other federal programs or with state emergency management agencies. (For a listing of this and several related GAO studies, see Appendix 1.3 at the end of this chapter.)

Both before and since the 2001 attacks, the Institute of Medicine (IOM) was commissioned to study various aspects of the medical and public health response to terrorism.\textsuperscript{15} A 1999 IOM study of chemical and biological terrorism threats, including research on early detection methods and treatments for exposed individuals, concluded that bioterrorism incidents would require very different handling techniques than chemical agent incidents. In contrast to military planning and preparedness, an attack on civilians would lack any warning. The study concluded that rather than develop de novo systems, the federal government should direct new support toward existing response systems for chemical and biological hazards or attacks.\textsuperscript{16}

In 2001 and 2002 the IOM released reports on a study to assess the effectiveness of the Metropolitan Medical Response System (MMRS).\textsuperscript{17} The second report identified a comprehensive approach for self-assessment of the local preparedness of MMRS cities and of central management. (Discussed further in Chapter 2 below.)

A different 2002 IOM report addressed preparation for outbreaks of pathogens that might be used in bioterrorism and covered topics such as ways to monitor, prevent, and respond to such incidents.\textsuperscript{18} A framework for considering bioterrorism was articulated as follows:

“The most powerful strategy may be to cast bioterrorism defense as a national security issue first and foremost. Indeed, it was suggested that the only way to acquire the resources needed to develop the capacity that bioterrorism defense

\textsuperscript{15} Institute of Medicine, \textit{Terrorism and Security Collection}, 2003.
\textsuperscript{16} Institute of Medicine, \textit{Chemical and Biological Terrorism}, 1999. Also see Institute of Medicine & National Research Council, \textit{Improving Civilian Medical Response to Chemical or Biological Terrorist Incidents}, 1998.
\textsuperscript{17} Institute of Medicine, \textit{Tools for Evaluating the Metropolitan Medical Response System Program: Phase I Report}, 2001. Also see Institute of Medicine, \textit{Preparing for Terrorism}, 2002.
\textsuperscript{18} Institute of Medicine, \textit{Biological Threats and Terrorism}, 2002.
requires is to equate these tools with other weapons defense tools. Although most people do not know the details of how much money or research and development are required to sustain our country’s armed forces, nonetheless they are able to express the essential role of such capabilities in our national security.”

Assessment of the Terrorism Threat and U.S. Vulnerability

By the end of the Twentieth Century, a body of intelligence and analyses had been assembled to support two sobering conclusions regarding the threat of terrorism:

- the United States was vulnerable to terrorist attacks with weapons of mass destruction, and
- the United States was inadequately prepared to deter or respond to such attacks.

Efforts to develop an enhanced federal policy framework for crisis management and consequence management became the framework that guided much of the subsequent terrorism response planning. The events of September 11th transformed these issues into a matter of dire urgency. The President and Congress took immediate steps through executive actions and a series of legislative enactments. A chronology of major federal policy responses following the September 11th attacks is listed in Appendix 1.4.

Post-September 11 Policy Responses

The first post-September 11 federal legislative response, enacted in October 2001, was an Emergency Supplemental Appropriations Act (PL 107-38) which provided $40 billion in emergency funding for disaster assistance, recovery efforts, anti-terrorism initiatives, national defense, and other programs. The first $10 billion was made immediately available and the remainder required further Congressional approval and was to be distributed over the next two years.

Another immediate action was the executive order establishing the Office of Homeland Security reporting to the President. Within two months, other major legislation was passed to grant broad authority for various U.S. agencies to combat terrorism. The U.S. Patriot Act (PL 107-56) addressed issues of intelligence operations, financial access by terrorist groups, and border security. The Aviation and Transportation Security Act (PL 107-188) enhanced security for all transport modes and established a new agency, the Transportation Security Administration (TSA).

The October 2001 anthrax outbreaks raised public and policy-makers awareness to the consequences of a bioterrorism attack, and the need to strengthen the public health infrastructure at state, local, and federal levels. The concept of public health infrastructure has been described as consisting of four components: workforce capacity and development, information and data systems, organizational capacity, and financial resources. Although Congress had passed bioterror-
rorism preparedness legislation in November 2000 (PL 106-505), funding was not authorized until 2001.21

The anthrax attacks, which targeted federal offices (the Senate, Supreme Court, and the U.S. postal system), mobilized Congress to pass sweeping bioterrorism legislation with authorized funding. Thus in June 2002, a comprehensive bioterrorism bill was passed, the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (PL 107-188).22 This legislation provided for:

- developing a national bioterrorism preparedness plan coordinated with the states;
- public health surveillance and reporting; expansion of laboratory capacity; and training and equipping of personnel (emergency response, public health, medical personnel);
- developing drugs, vaccines, and other products to combat biological terrorism agents, including smallpox vaccine development and procurement;
- grants for state, local, and hospital preparedness for bioterrorism, training for health professionals, and efforts to address relevant health personnel shortages;
- maintaining a Strategic National Stockpile of drugs, vaccines and other supplies (replacing the National Pharmaceutical Stockpile program); and assuring the safety of food, drug, and water supplies.

**Bioterrorism and State-Level Policy for Public Health Emergencies**

The anthrax bioterrorism outbreaks brought attention to the inadequacy of state-level public health laws to deal with a public health emergency such as bioterrorism. In 2002, a group of legal scholars, public officials, and others worked to develop a Model State Emergency Health Powers Act (MSEHP).23 Much of the public health law that serves to protect the health and safety of the population falls under State legal jurisdiction. The model act addresses issues related to the “police power” of officials to take actions to protect the public’s health and safety. The scope of this authority is substantial, as noted by an author of the model act,

“In summary, MSEHP requires the development of a comprehensive plan to provide a coordinated, appropriate response in the event of a public health emergency. ... During a public health emergency, state and local officials are authorized to use and appropriate property as necessary for the care, treatment, and housing of patients and to destroy contaminated facilities or materials. They are also empowered to provide care, testing, treatment, and vaccination to persons who are ill or who have been exposed to a contagious disease and to separate affected individuals from the population at large to interrupt dis-

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23 Gostin, L. O., 2002
ease transmission. At the same time, the act recognizes that a state’s ability to respond
to a public health emergency must respect the dignity and rights of persons.”

As of late 2002, 19 states had enacted a version of the MSEHP. States addressed many other
policy issues in the wake of the September 11th attacks and the anthrax outbreaks, but these ex-
tend beyond the scope of this report.

National Strategy for Homeland Security

In July of 2002 the President released the National Strategy for Homeland Security, which
had been prepared by the Office of Homeland Security under director, Governor Tom Ridge.
The purpose of the National Strategy was

“To mobilize and organize our Nation to secure the U.S. homeland from terrorist attacks…
an exceedingly complex mission that requires coordinated and focused effort from our
entire society – the federal government, state and local government, the private sector,
and the American People.”

The National Strategy called for the establishment of a Cabinet-level Department of Homeland
Security and presented the framework to guide and coordinate federal efforts. There were six
critical mission areas that would together be directed at preventing further attacks, protecting vital
assets, and preparing for and responding to attacks. These mission areas were:

1. Intelligence and warning
2. Border and transportation security
3. Domestic counterterrorism
4. Protecting critical infrastructure and key assets
5. Defending against catastrophic threats

The last mission area (emergency preparedness and response) engages health and
medical systems to help in “minimizing the damage and recovering from attacks that do occur.”
This mission would be based on existing programs but envisioned a more coordinated national
system.

“Many pieces of this national emergency response system are already in
place. America’s first line of defense in the aftermath of any terrorist attack
is its first responder community. … Yet multiple plans currently govern the
federal government’s support of first responders during an incident of na-

24 Ibid, p. 84.
tional significance. … The Department of Homeland Security will consolidate federal response plans and build a national system for incident management in cooperation with state and local government.”27

Several specific initiatives listed under this mission would engage health and medical care personnel. These include

- “prepare health care providers for catastrophic terrorism response;
- augment America’s pharmaceutical and vaccine stockpiles;
- prepare for chemical, biological, radiological, and nuclear decontamination;
- build a national training and evaluation system; and
- enhance the victim support system. “

The importance of properly training and protecting (equipping) personnel was noted:

“Our federal, state, and local governments would assure that all response personnel and organizations are properly equipped, trained, and exercised to respond to all terrorist threats and attacks in the United States.”

One of the guiding principles of the National Strategy was a concept that has been called a “dual purpose strategy,” which simply means that the steps taken to improve homeland security may also provide other benefits to society. The National Strategy report noted, “We will build a medical system that is not simply better able to cope with bioterrorism but with all diseases and all manner of mass-casualty incidents.” This dual-purpose concept could help justify the costs and other challenges of sustained terrorism preparedness. As a 2002 National Research Council report explained:

“Sustaining a long-term national effort against terrorism will require minimizing the costs of security efforts and avoiding as much as possible placing extra burdens on accustomed conveniences or constraints on civil liberties. Most of the recommendations in this report, if acted on, will not only make the nation safer from terrorist attacks but can also make it safer from natural disasters, infectious diseases, hackers disrupting the Internet, failures in electric power distribution and other complex public services, and human error causing failures in such systems. This promise will help sustain the public’s commitment to addressing the terrorism threat, and suggests that it is not inappropriate that many of the research and development programs to counter terrorism should be pursued in close coordination with similar efforts to improve the quality of life in civil society.”28

27 Ibid.
The Department of Homeland Security (DHS)

The National Strategy called for the establishment of a cabinet-level Department of Homeland Security (DHS), which would represent the largest federal reorganization in 50 years. When fully implemented, it was expected that the DHS would employ almost 170,000 personnel and have a $37 billion budget.\(^{29}\) Congress passed the authorizing legislation, *Homeland Security Act of 2002* (PL 107-296) in November 2002.\(^{30}\) The two sections of the law that relate to public health and medical care are Title III: Science and Technology and Title V: Emergency Preparedness and Response. Title III addressed the transfer of research and development activities for biological, chemical, radiological, and nuclear defense programs to the DHS from the Department of Energy (DoE) and the Chemical Biological Defense Program of the Department of Defense (DoD). Title V addressed the transfer of response and preparedness programs from the Department of Health and Human Services (HHS) and other agencies to the DHS.

The DHS organization was to be implemented over several months, beginning in January 2003, and was to include the formation of five major divisions (or “directorates”) with Undersecretary’s appointed to manage the federal programs transferred to DHS.\(^{31}\) The Divisions are listed below and one can see the close relationship to the National Strategy blueprint.

- Information Analysis and Infrastructure Protection,
- Science and Technology,
- Border and Transportation Security,
- Emergency Preparedness and Response, and
- Management.

The DHS Undersecretary for Emergency Preparedness and Response (EPR) is charged with consolidating existing federal emergency response plans into a single, coordinated national response plan. This includes overseeing FEMA, the National Disaster Medical System (NDMS), the Metropolitan Medical Response System (MMRS), and other programs. There is expected to be an ongoing relationship between DHS EPR and relevant HHS units and administrators.

Chapter Conclusion

Implementation of the nation’s new emergency preparedness plan is underway. But it is not an easy process. A GAO study of the management challenges facing DHS noted, “Transitioning new agencies into a new department will be challenging, with the implementation of a fully integrated department expected to take 5 to 10 years.”\(^{32}\)

As will be seen in the two chapters that follow, much has been done to improve the nation’s disaster medical response capability, both in terms of the organization of that capability and in terms of the training needed to make that capability effective. But much more remains to be done. There are weaknesses and inefficiencies in the system that need to be addressed; improvements need to be designed, implemented, and maintained.
Appendix 1.1 Two Examples of Disaster Response


“In July 2001, a 60-car freight train derailed in a 1.5-mile-long tunnel near the heart of Baltimore, Maryland. The train was carrying several containers of hazardous materials, some of which ignited an extremely hot fire. The incident triggered a response from five fire departments. Shortly thereafter a hazardous materials task force was also called in from South Baltimore. The disaster was complex because the responders were combating a mixture of hazardous materials. In addition, the fire was located in a confined space. Smoke and liquid runoff affected a wide area. To protect public health and safety, Baltimore police shut down area roads, including interstate highways, and the U.S. Coast Guard blocked access to portions of Baltimore’s Inner Harbor. Health officials monitored air quality. Members of the Baltimore Fire Department went door to door to warn residents to shelter in place and keep windows closed.”

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Oklahoma City Bombing of Federal Building, 1995

“The response to the 1995 bombing in Oklahoma City illustrates the practice of a local jurisdiction that provided immediate resources and whose efforts were supplemented, but not supplanted, by state and federal resources. On April 19, 1995, the Alfred P. Murrah Federal Building was the target of a massive terrorist bomb. The Murrah Building partially collapsed, and many surrounding structures were severely damaged by the explosion. The Oklahoma City Fire Department (OCFD) responded to the scene to provide immediate rescue efforts, establish incident command, and coordinate the interagency response throughout the disaster under a local incident commander.

A total of 759 people were injured or killed in the blast. Health and medical issues were handled by a number of organizations. Government agencies and private businesses all reported to the same command system. Emergency Medical Services Authority, a private ambulance service, transported victims to hospitals. Fire, emergency medical, and police departments in surrounding areas provided mutual aid by performing services at the bombing site and by responding to baseline emergencies in other areas of the jurisdiction while city resources were busy at the scene. The state medical examiner’s office tracked missing persons, identified recovered victims, and notified families. The state office of emergency services interfaced with the FEMA urban search-and-rescue teams, which assisted OCFD with the rescue of victims and the recovery of bodies.

Local, state, and federal resources provided security on the scene and carried out investigations. The Oklahoma City Police Department (OCPD) established perimeters, identified the evidence recovery area, and maintained control of the surrounding streets. OCPD worked with the Federal Bureau of Investigation in criminal investigations and the recovery of evidence and also directed state and federal military personnel resources. Public works personnel were essential to scene safety and maintenance; they cut off electric power and natural gas to affected buildings, established sanitary facilities for rescue workers and lighting for nighttime operations, and picked up refuse. The local telephone company installed an emergency cellular phone system to assist with communications. Fire, police, emergency medical services, and other resources from surrounding jurisdictions responded through re-established mutual-aid agreements to assist at the scene and to cover public safety functions in areas of Oklahoma City unaffected by the bombing.”

33 Institute of Medicine, Preparing for Terrorism, 2002, p. 38.
34 Ibid, p. 36-37.

<table>
<thead>
<tr>
<th>Year</th>
<th>Legislation or Presidential Action</th>
<th>Areas Addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974</td>
<td>Stafford Disaster Relief and Emergency Assistance Act (PL 93-288)</td>
<td>Authorized governors to request federal assistance when disaster needs go beyond state’s capacity to respond.</td>
</tr>
<tr>
<td>1990</td>
<td>Trauma Care Systems Training and Development Act 1990 (PL 101-590)</td>
<td>Supported development of model and comprehensive trauma systems at the state and local level.</td>
</tr>
<tr>
<td>1995</td>
<td>United States Policy on Counterterrorism Presidential Decision Directive (PDD 39)</td>
<td>Identified federal agency responsibilities for combating domestic terrorism. FEMA as lead agency for managing the consequences of terrorist attack and the FBI as lead agency for crisis management and law enforcement.</td>
</tr>
<tr>
<td>1996</td>
<td>Anti-Terrorism and Effective Death Penalty Act (PL 104-32)</td>
<td>Authorized FEMA and DoJ to develop terrorism training for fire, emergency medical services, and public safety personnel in 120 large cities.</td>
</tr>
<tr>
<td>1998</td>
<td>Critical Infrastructure Protection (PDD 63)</td>
<td>Addressed developing a strategy to combat cyber- or computer-based attacks.</td>
</tr>
<tr>
<td>2000</td>
<td>Public Health Threats and Emergency Act of 2000 (PL 106-505)</td>
<td>Authorized HHS to respond to public health emergencies, including procedures for strategic stockpiles of vaccines and medical supplies for deployment after a bioterrorist attack.</td>
</tr>
</tbody>
</table>
Appendix 1.3 Selected General Accounting Office (GAO) Studies Relevant to the Medical Response to Terrorism

Capitol Hill Anthrax Incident: EPA's Cleanup Was Successful; Opportunities Exist to Enhance Contract Oversight. GAO-03-686, June 4, 2003.


Source: U.S. General Accounting Office, Special Collections, 2003
### Appendix 1.4 Selected Federal Policy Responses Following the September 11th Attacks

<table>
<thead>
<tr>
<th>Year</th>
<th>Legislation or Presidential Action</th>
<th>Areas Addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 2001</td>
<td>Office of Homeland Security (Executive Order 13288)</td>
<td>Established OHS to develop and coordinate a national strategy to secure the U.S. from terrorist attacks and coordinate the executive branch efforts.</td>
</tr>
<tr>
<td>October 2001</td>
<td>USA Patriot Act of 2001 (PL 107-56)</td>
<td>Granted federal authority to track and intercept communications for law enforcement and foreign intelligence purposes. Provided regulatory powers over foreign money laundering. Secured borders against foreign terrorists.</td>
</tr>
<tr>
<td>November 2001</td>
<td>Aviation and Transportation Security Act (PL 107-71)</td>
<td>Established new Transportation Security Administration within Department of Transportation, in charge of security for all modes of transportation.</td>
</tr>
</tbody>
</table>
Chapter 2: Medical Response Programs

“With the growing number of terrorist attacks, the United States has come to realize it is no longer possible to anticipate or thwart all terrorist activity. However, it is possible and prudent to undertake a campaign to improve bioterrorism response in order to minimize the consequences of any attack…”

-- U.S. Department of Homeland Security

“Therefore, we need a comprehensive national system to bring together and coordinate all necessary response assets quickly and effectively. We must plan, equip, train, and exercise many different response units to mobilize without warning for any emergency.”

--National Strategy for Homeland Security

The terrorist attacks of September 11, 2001, were a test of the nation’s ability to respond quickly and effectively to an unpredictable, terrorizing, and high-fatality disaster. Unfortunately, more such “tests” are likely; the threat of future attacks seems very real. These could take any form, with large populations potentially exposed to the dangers of chemical, biological, radiological, and/or explosive assaults. The Nation now knows, had it not known before, that it must be prepared to deal with such horrendous destruction. Critical to any system of defense is the ability to mount an effective emergency medical response in the face of casualties numbering in the thousands or even tens of thousands.

The federal medical response programs that were activated on September 11 remain the core of the federal medical response to future terrorist attacks. Each program addresses a different aspect of response to a mass casualty or other terrorist attack. In consort, the programs provide the critical infrastructure, guiding organization, and personnel for the nation’s medical response and preparedness strategy.

Organizational structure, names, oversight, and the like are evolving with the administrative transfer of key programs into the DHS. Healthcare professionals—including healthcare leadership—planning to participate in emergency response and preparedness will need to become familiar with the functions and strategies of these programs and with their local organization. As background and a starting point, this study identified assumptions that have appeared to guide federal program strategies and planning. These assumptions are listed below.

1. A terrorist attack may use any type of destructive and lethal agents (biological, chemical, radiological, nuclear or conventional weapons). Therefore, an all-hazards approach needs to guide planning.

2. The local first responders, civilian volunteers, and health care providers will be the key response groups in the first several hours after an attack. These groups will aid and assist the injured, search for and rescue others, and provide immediate medical care. Thus strong local response planning, coordination, systems, and resources are essential.

3. Immediate medical care needs may overwhelm local first responder capacity, so qualified emergency medical disaster assistance and supplies must be deployable to the attack scene quickly.

4. Large numbers of casualties may overwhelm the capacity of local medical care systems, making safe and organized transport to other facilities necessary. Experts have estimated that no metropolitan area could handle more than 1,000 serious casualties.

5. High-risk terrorist targets would likely be in large metropolitan areas. It is in such areas that a high level of casualties and physical destruction or incapacitation could readily be achieved and where societal disruption would be more marked.

6. Protecting the health and safety of the first responders and health care providers (and their families) is an essential planning step.

7. The mental health needs of first responders, victims, and their families, will be significant, and early interventions to deal with them will be needed.

8. Planning should consider the “dual purpose” concept: to plan so that resources can be used not only for the rare event (terrorist attack) but also for more likely threats such as outbreaks of naturally occurring or newer infectious diseases, e.g. influenza, West Nile virus, Severe Acute Respiratory Syndrome (SARS), or Ebola virus.

9. The nature of an attack will define whether major public health efforts must be launched to prevent further cases and casualties (e.g., an outbreak of a contagious illness such as smallpox, continued new cases from lingering anthrax spores, radiological exposures after a dirty bomb or nuclear event).

The remainder of this chapter will elucidate these planning assumptions in the course of describing the current major federal disaster and terrorism medical response systems.
National Disaster Medical System (NDMS)

The NDMS was originally established in 1984 as a coalition of four federal agencies (FEMA, HHS, Department of Defense [DoD] and the Department of Veterans Affairs [DVA]) working with private sector health care providers and local resources. The NDMS is intended to provide "a single, integrated national medical response capability for assisting state and local authorities in dealing with the medical and health effects of major peacetime disasters," as well as providing backup resources in caring for casualties from overseas armed conflicts if the DoD and the Veterans Administration (VA) treatment capacity is exceeded.\(^\text{37}\) The HHS Office of Emergency Preparedness (OEP) provided organizational support for the NDMS until the transfer to DHS. Funding support through OEP was modest and reported at $1.5 million for each fiscal year from 1999 through 2001.\(^\text{38}\)

The DHS has described the NDMS as "a cooperative asset-sharing program among Federal government agencies, state and local governments, and the private businesses and civilian volunteers to ensure resources are available to provide medical services following a disaster that overwhelms the local health care resources."\(^\text{39}\) The major functions of the NDMS in response to mass casualties are:

- Emergent medical response to a disaster area in the form of teams, supplies, and equipment.
- Patient evacuation from the disaster site and transport to safe and resourced areas of the country.
- Definitive medical care at participating hospitals in the transport areas.\(^\text{40}\)

These functions are carried out by three different NDMS components, with the following services expected to be provided. The *emergent medical response* function is carried out on site by deployable rapid medical response teams. These include a variety of different types of voluntary medical response teams, including DMATs, other specialized teams sponsored by the federal government (e.g. the Public Health Service Commissioned Corps, the Veterans Administration), and various other specialty teams (e.g. for burn care, children’s care, mental health care, immunization and medication distribution).

The *patient evacuation function* is managed and supported by the DoD. While the DoD may use any type of transport needed, from land vehicles to helicopters and other air transport, the aero-medical units (medical equipped transport units) are expected to be used for this support. In addition to arranging for safe patient transport, patient evacuation includes coordination with various receiving hospitals and personnel on-site at the disaster.\(^\text{41}\)

\(^{39}\) Ibid.
\(^{41}\) Alen, J., 2001.
The definitive medical care function is carried out by private hospitals that are voluntarily enrolled in NDMS. These collaborating hospitals provide bed capacity and their own staff to care for patients. The scale of hospital reserve capacity has been estimated at 1,500 - 2,000 hospitals with a combined total of close to 110,000 available beds. The costs of patient care services are a responsibility of the NDMS. The responsibilities of participating hospitals include providing updated information on bed availability, treating patients evacuated to their hospital during a disaster, and participating in NDMS training and exercises.

NDMS operations are organized under geographically dispersed regional Federal Coordinating Centers (FCCs), which are directed by DoD or VA staff. In 2002, there were 65 FCCs, located near military airfields or VA hospitals. Each FCC and collaborating hospital must be located within 50 miles of an airfield to allow for timely patient transport. The FCCs play a critical role in the operation of the NDMS. They recruit hospitals and inventory beds and staffing, assist with local planning, work with local agencies, and sponsor training and exercises. The FCCs are also expected to work with state and local emergency management agencies (EMAs), public health and safety officials, and hospitals. During a disaster, the FCCs organize and coordinate the medical care for any patients transferred to hospitals in their catchments area. For a map of FCC locations, see Appendix 2.1 at the end of this chapter.

The first full-scale and national activation of the NDMS occurred on September 11th, 2001. The NDMS lists about eight to ten NDMS activations over each of the last several years, although these have been regional activations. The most common activations have a limited scale (one or more DMATs) and have occurred during naturally occurring local disasters, as well as during high profile events. An illustrative list of local or regional NDMS activities were those that occurred with

- Hurricane Brett (1999),
- California forest fires (1999),
- Egypt Air crash (1999),
- Y2K (1999),
- State of the Union Address (2000),
- North Dakota floods (2000),
- Special Olympics - Alaska (2001),
- Tropical storm Allison (2001),
- anthrax prophylaxis NY/DC (2001), and the
- Salt Lake City Olympic Games (2002).

Assessing the Capacity of Collaborating Hospitals and Their Staff

The actual numbers and readiness of NDMS collaborating hospitals, beds and staffing are critical issues. In 2001, an advisory group noted “It has been more than five years since a comprehensive inventory of medical capabilities under the NDMS has been conducted. It is by no means certain that ‘current’ information on surge capacities developed under the NDMS agree-

ments, such as available bed space, is valid." The GAO reported that the numbers of collaborating hospitals and available beds need to be verified and those figures need to be kept current. Hospitals join NMDS voluntarily, committing to receive and provide needed care to patients during a disaster, and to be reimbursed for the costs of care. Based on information gathered for this report, we learned that the current process of monitoring hospitals and beds is managed through signed annual memorandums of understanding (MOUs) between collaborating hospitals and the NDMS. Collaborating hospitals are to provide monthly reports of bed counts (or more often if needed) to their FCC. An estimate of beds and hospitals available in September 2003 was 106,145 beds in about 2,000 hospitals.

Another GAO study noted that, "It was not until after September 11, 2001, that government and hospital officials came to view hospitals as an integral component in local planning for responding to a terrorist event." Despite the recent availability of federal funding, the readiness of U.S. hospitals to handle casualties from terrorist attacks may be underdeveloped due to the relatively brief time they have had to consider and organize their involvement. Further information on the feasibility and planning steps needed to make these beds available and staffed to accept large numbers of casualties is another aspect of this monitoring, for which we found no details.

The adequacy of hospital staffing, in terms of the numbers of staff and their competency and training to handle casualties with various injuries related to chemical, biological, radiological or nuclear (CBRN) agents is an important issue. The current national shortages of key hospital personnel, particularly nurses, but also pharmacists and technologists, suggest that hospitals may have great difficulty staffing these designated beds. Moreover, despite federally sponsored programs to train and equip hospital staff to care for casualties from biological and chemical terrorism agents (described in the next chapter), the process to prepare hospitals is expected to extend over many years. A recent study of over 1,500 responding urban hospitals found that hospitals had taken steps to improve their bioterrorism planning and coordination with local and state groups. Some training is being offered to staff. However, many hospitals have reported insufficient medical equipment to treat large numbers of ill patients and only half of the hospitals studied had participated in drills or exercises for bioterrorism events. The urban hospital study noted that the American Hospital Association reviewed the study report and generally concurred with the findings.

**Disaster Medical Response Teams**

Over the years, several federal departments have organized special response teams to

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45 Jake Jacoby, MD, FACP, FACEP, Team Leader, DMAT San Diego CA-4, Personal communication, September 04, 2003.
assist with specific aspects of terrorism incidents or other disasters. In 2001, 24 different teams from eight federal agencies were identified.48 These teams could be deployed to disasters and assist local and state responders with managing the specific consequences for which they had special expertise and personnel. For example, the Department of Energy (DoE) supports radiological assistance program teams; the Environmental Protection Agency (EPA) supports an environmental response team and a radiation emergency response team; the Department of Transportation has Coast Guard strike teams; and the Department of Defense has several technical advice and response teams that may assist with civilian efforts in the areas of chemical-biological incidents and radiological or nuclear events. HHS managed the NDMS, which coordinated the disaster medical response teams.

The NDMS manages and directly provides organizational support and helps secure training for several types of rapid response disaster assistance teams that are based across the country. 49 These voluntary and federal multidisciplinary medical teams have specific expertise and personnel that can be deployed to nearby or distant locations to provide emergent casualty care. Most teams are staffed with volunteer disaster medical personnel. All of the teams listed below (except the NNRT and NPRTs) were in place on September 11, 2001. The number of personnel registered with the NDMS in late 2001 was estimated at about 7,000, although the personnel database had not been examined for duplicates or inactive personnel.

The response teams that are part of the NDMS are listed below.

- **Disaster Medical Assistance Teams (DMATs)** are rapid response teams of 35 or more specified members, including physicians, nurses, pharmacists, physical therapists, respiratory therapists, dentists, environmental health staff, engineers, and other healthcare and support personnel (53 teams with 29 Level 1 teams and 24 Level 2 & 3 teams).
- **National Nurse Response Teams (NNRTs) and National Pharmacist Response Teams (NPRTs)** are located in ten national regions to assist with bioterrorism events and provide mass immunizations, medication distribution for prophylaxis, and counseling of the public (10 teams for each discipline).
- **National Medical Response Teams (NMRTs)** are select teams that respond to attacks involving weapons of mass destruction (WMD), with expertise in handling hazardous materials and nuclear and bioterrorism threats (four teams).
- **Veterinary Medical Assistance Teams (VMATs)** include multiple specialties in veterinary medicine that provide disaster site veterinary services (four teams).
- **Disaster Mortuary Operational Response Teams (DMORTs)** consist of multiple specialties that can provide victim identification and mortuary services (11 teams).
- The specialty medical care teams consist of five burn teams, two pediatric teams, one crush medicine team, three mental health teams, and one international surgery and medical team.


Management Support Teams (MST) organize the on-site response at disasters (one team).

Geographic distribution and location vary by category of teams. For example, most existing DMATs were developed in communities where interested and committed disaster personnel led efforts to organize team personnel and recruit sponsors. Thus the distribution of DMAT teams does not appear to have been based on an assessment of community risk status or any type of overall plan (See Appendix 2.2 for maps showing locations of Level 1 and Levels 2 and 3 DMAT teams). One reported exception to this statement is the DMAT in New Jersey, which was developed when community leaders recognized that they were at high risk for attack and had no response team.

The medical specialty teams appear to have had more systematic location planning with regional coverage and proximity to large regional metropolitan areas. For example, burn teams are located so as to serve large geographic regions of the country (See Appendix 2.2 for burn team regions and locations).

The next sections provide further details on the major medical response teams (DMATs) and the newer specialized and more limited scope teams for nurses and pharmacists (NNRTs and NPRTs).

**Disaster Medical Assistance Teams (DMATs)**

Each team has a local sponsoring organization, which could be a major medical center, public health or safety agency, or other public or private non-profit organization. The teams recruit members, train together, secure equipment, and commit to providing emergency care during a disaster or other critical event. DMATs are required to provide four services: search and rescue, triage and initial stabilization, definitive medical care, and evacuation.

Teams may be activated to serve their community, but fully prepared teams (Level 1) must be deployable to travel and serve at events within their state or elsewhere across the country. The Level 1 teams are the most prepared level of team and they must be capable of being deployed to a local or distant site for up to two weeks. Level 1 teams must be deployable within twelve hours and must carry supplies and equipment to be self sufficient for at least 72 hours. A Level 2 team can back-up a Level 1 team, but does not have full equipment. Members of a Level 3 team are not trained to be deployed as a team, but qualified members can be deployed as back-up personnel for other teams.

The required staffing for a Level 1 team includes at least 35 individuals with specified professional backgrounds; however, teams may staff to 75 or more to assure filling all vital positions during emergency call-ups. DMATs can modify the composition of the deployed team somewhat depending on the nature of the event. As an example, the Iowa DMAT staffing for a response is listed below, with the number of staff in each position indicated in parentheses.

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Comprehensive Iowa DMAT Staff Composition and Numbers for a Field Response Team

<table>
<thead>
<tr>
<th>Position</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Director</td>
<td>1</td>
</tr>
<tr>
<td>Deputy Team Leader</td>
<td>1</td>
</tr>
<tr>
<td>Physician Medical Officers</td>
<td>4</td>
</tr>
<tr>
<td>PA-Cs or Advanced Practice Nurses</td>
<td>4</td>
</tr>
<tr>
<td>Emergency/Trauma Nurses</td>
<td>6</td>
</tr>
<tr>
<td>Paramedics</td>
<td>6</td>
</tr>
<tr>
<td>Pharmacist</td>
<td>1</td>
</tr>
<tr>
<td>Pharmacist Assistant</td>
<td>1</td>
</tr>
<tr>
<td>Support Officers</td>
<td>5</td>
</tr>
<tr>
<td>Administrative/Record Officer</td>
<td>1</td>
</tr>
<tr>
<td>Logistics Officer</td>
<td>1</td>
</tr>
<tr>
<td>Communication Officer</td>
<td>1</td>
</tr>
<tr>
<td>Equipment Officer</td>
<td>1</td>
</tr>
<tr>
<td>Home Base (non deployed) Officer</td>
<td>1</td>
</tr>
<tr>
<td>Additional positions determined by DMAT based on incident/event type</td>
<td>5</td>
</tr>
</tbody>
</table>

Responsibilities of individual voluntary DMAT members are substantial and include the following:

- Maintain an active license as a health professional in their home state or possess a special skill needed in a support volunteer (e.g., communications, accounting, logistics).
- Be physically able to train, be deployed, and serve at a disaster site; maintain required immunizations; complete an application and be approved.
- Attend regular team meetings and obtain required training; secure their own personal protective equipment and other personal gear.
- Have made arrangements with their employer and families such that they can serve at distant sites for periods up to one week or more.
- Maintain communications with the team.

If deployed on a federal request, the DMAT members are considered temporary federal employees and are compensated for their duty time. Many DMAT personnel take this time away from their usual work as vacation or leave time.

Many DMATs maintain a Web site or newsletter as a means of sharing information on day-to-day activities, team relationships, trainings, meetings, and team deployments. The diversity of team sponsorship and many team Web site links are listed in Appendix 2-C at the end of this chapter.

National Nurse Response Teams and National Pharmacist Response Teams

In September 2002, two new categories of rapid response teams were established. Both involve single profession and a limited scope of training and response. The American Nurses Association (ANA) is the national sponsor for regional National Nurse Response Teams (NNRTs) to assist with public health emergencies or bioterrorist attacks. The national sponsor for the

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51 Iowa Disaster Medical Assistance Team (IA-DMAT), 2002.

National Pharmacist Response Teams (NPRT) is the Joint Commission of Pharmacy Practitioners Working Group on Emergency Preparedness and Response, which includes six large pharmacist organizations. 53

These teams are to have about 200 members and be ready to serve their local or regional area for shorter periods of time than do the DMATS. One team is to be located in each of ten regions of the U.S. The teams are to provide assistance with public education and counseling, mass vaccination, emergency medication distribution, and biological terrorism threats. Their training requirements are more limited than other rapid response teams.

Each NNRT recruits registered nurses. Training is provided through an online continuing education course and team members must meet ongoing educational requirements. The ANA serves a national recruitment function and works with state nurses associations and national nursing organizations to support the NNRT. HHS is to provide support for development and organization, administrative management, training, and program development and delivery. The NPRTs teams have the same general plan as the NNRT. These teams would also assist with public education, immunizations, and medication distribution for prophylaxis to exposures.

Commentary on the National Disaster Medical System and Medical Assistance Teams (DMATs)

The NDMS and its DMATs have played an important medical role in major national disasters, most notably the September 11th attacks, and the NDMS remains a vital part of the nation’s homeland security and emergency response program. Yet, there are aspects of the program that call for improvement and our analysis describes concerns about various components and functions of the NDMS.

1. The NDMS hospital capacity in terms of their emergency departments and reserve bed and staffing capacity need further evaluation.
   - It appears that extra hospital capacity (often called hospital surge capacity) is in fact very limited. Community hospitals do not appear to have hospital bed and emergency department surge capacity that would be sufficient to handle large numbers of casualties. An analysis by a major national healthcare organization noted in 2003, “Overcrowded emergency departments are a clear and visible symptom of a destabilized health care environment, and raise clear and compelling questions as to whether any real surge capacity exists in these communities.” 54 Many commentators have estimated that no metropolitan area in the country could handle 1,000 or more serious casualties.
   - The concept of “graceful degradation” of care, which involves keeping order and function within hospitals and other facilities, in part through “degrading” the level of service that could be provided, has not been adequately discussed and planned for. 55 This care planning, which is necessary, would set aside many of the standards with which patients and

54 Joint Commission on Accreditation of Healthcare Organizations, Health Care at the Crossroad, 2003, p. 20
55 Ibid, p. 26
staff have become accustomed. It could violate the current emphasis on patient privacy, safety and quality, and may require special explicit dispensation planning among hospital administrators and staff. This may involve planning for triage to ration certain services, equipment, pharmaceuticals, and supplies, and placing patients in non-traditional sites for triage, convalescence, or terminal care.

- There is no clear sense of the commitment, engagement or even level of awareness of local health and medical care systems and their leaders when it comes to the reserve hospital capacity concept. Anecdotal evidence suggests at best a mixed picture, and clearly a serious lack of awareness and engagement among some participants.

2. **Bioterrorism planning and concepts need to be fully considered and integrated into the NDMS programs.**

- Collaborating hospitals are not likely to be adequately prepared for bioterrorism casualties. While readiness of hospitals and their staff to treat bioterrorism patients may have improved, it remains a daunting challenge. As described below, bioterrorism training has been a key focus of federal and private training efforts; however it is not clear that training programs have given priority to NDMS collaborating hospitals.

- Under the evacuation planning, there must be consideration of alternatives to patient transport to remote hospitals for victims of bioterrorism patients exposed to contagious lethal bioterrorism agents (e.g. smallpox). Contingency planning for local care of these patients is quite complex, yet must be addressed.

3. **Coordination between the NDMS and MMRS programs should be evaluated.**

- An advisory panel recommended a thorough review of both the NDMS and the MMRS.\(^{56}\)

- It is not clear how NDMS has coordinated its planning with the MMRS so as to adequately handle the large numbers of potential casualties in high-risk metropolitan areas.

4. **DMAT team location has not been planned in a way to assure that Level 1 teams are located in key high-risk metropolitan areas.**

- Few of the DMATs are located in major metropolitan areas. Since large metropolitan areas are considered high-risk targets and the immediate response to an attack must come from local providers, the absence of highly trained teams in metropolitan areas is a significant flaw in the DMAT program design.

- Following the September 2001 attacks, the NDMS received many inquiries from groups interested in starting a DMAT in their community. However, NDMS had not accepted applications for new DMATs throughout 2002 and 2003. There is no published information on which metropolitan areas have considered and now wish to develop and sponsor a DMAT.

- One approach worth considering is to encourage the nation’s 125 academic health centers (AHCs), which are located in most large metropolitan areas, to become involved.

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with leading or helping organize at least one Level 1 DMAT near each key metropolitan area. Many of the largest cities in the country have two or more AHCs and extensive medical care resources. The AHCs have multidisciplinary specialists and experts and also sponsor large numbers of education and training programs for health professionals. The Association of Academic Health Centers (along with other key groups with members located in AHCs) has already taken on a leadership role in informing members about terrorism preparedness.\(^{57}\)

5. A comprehensive review of the staffing of the overall DMAT programs is required. These volunteer teams form a key part of the country’s emergency disaster response capability, yet there has been limited assessment of their capacity to adequately cover major disasters.

- Some estimates indicate that there were as many as 7,000 health care personnel involved with these teams. More recent NDMS reports and Web sites list 5,000 personnel (not counting the NNRT and NPRT members). However, there has been no centralized review of the composition and adequacy of these groups.
- Team and individual training for bioterrorism response should be evaluated.
- Since many DMAT Web sites indicate an interest in recruiting more members to their teams, there would appear to be both a need and the ability to expand personnel in the existing teams.
- Any evaluation should consider opportunities to enhance the benefits or recognition of the voluntary work of these health professionals.

6. New team development or team expansions could engage federal personnel and programs.

- The Surgeon General has discussed plans to expand the size of the Commissioned Corp Readiness Force (CCRF), which would seem to be an advisable step.
- The DVA and the VA health system already have many roles and resources to commit to the NDMS program and overall federal homeland security plans. VA hospitals are distributed across the country and in many metropolitan areas. Thus they could play a major role in organizing and staffing new or expanded DMAT and other teams.

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\(^{57}\) Association of Academic Health Centers, 2003.
Metropolitan Medical Response System (MMRS)

In 1996, Congress authorized HHS to contract with the nation’s largest cities to develop a program that became the Metropolitan Medical Response System (MMRS). A rationale that guided the MMRS design was the expectation that terrorist attacks would likely be aimed at targets within larger cities and that, while large cities had resources to respond, they often lacked the necessary organization and coordination of these resources. Analysts report that the 1995 terrorist attack with a fatal nerve gas (sarin) in the downtown Tokyo subway system was a major influence on the MMRS concept. This led to plans to protect Washington DC from a chemical attack. The original plan engaged surrounding Maryland and Virginia county resources and personnel to have a new medical strike team that could be trained and equipped to respond.\(^{58}\) However, further consideration led to plans to use an all-hazards approach including preparation for attacks using biologicals, chemical, radiological, and nuclear agents.

The MMRS program was designed to build upon existing local response systems.\(^{59}\) Key concepts of efficiency and local flexibility guided this strategy. As reported in an IOM study, “Strengthening existing systems not only improves the emergency response to terrorist incidents, but also improves the emergency response to other disasters.” Also noted was the lack of standards for designing local response systems, “No universal standard currently exists to define the concept of an ’adequate’ capacity of municipal emergency management, and the U.S. metropolitan areas have a wide range of capabilities.”

The IOM report described the basic strategy of the MMRS program as federal support to strengthen local systems. Ideally, MMRS support was to be used “to enhance local capabilities by organizing, equipping, and training local fire, rescue, medical, and other emergency management personnel to deal with the consequences of a terrorist attack with CBR agents….Perhaps the most important component of the program is the planning and organizing that is required to identify and involve all local, state, and federal offices and agencies with relevant resources…”\(^{60}\)

The MMRS system has developed through contracts with new cohort groups of cities selected by population rankings. Twenty-seven cities were funded in the 1996 and 1997 rounds. New cohorts of cities were added almost yearly to have 122 cities designated by 2002, with plans to expand this number to 200 cities by 2005. (For a map and list of MMRS locations, see Appendix 2.4 at the end of this chapter.)

Each new MMRS city has to develop a coordinated response plan that brings together five key components (fire, police, emergency medical services, hospitals, and public health) and other relevant local and state groups. The plan must cover core response functions such as identification of attack agents, decontamination of exposed persons or control of infectious conditions, emergency treatments, triage and patient transport, definitive care, mass immunization or prophylaxis, mass fatality management, and environmental assessment of residual health risk.

Thus the key functions of each MMRS program were to encompass:

\(^{58}\) Institute of Medicine, Preparing for Terrorism, 2002. p 23  
\(^{59}\) Ibid, p. 6  
\(^{60}\) Institute of Medicine, Preparing for Terrorism, 2002.
• A plan for terrorist incidents (all hazards approach, nuclear/biological/chemical agents)
• In the event of such incidents, the capacity to provide initial on-site emergency medical services, patient transport to hospitals, management and decision making for evacuation and disease containment, hazardous materials (HAZMAT) handling and decontamination, sheltering people, and needed post-event follow-up.

Federal funding support for the MMRS cities has been modest and insufficient for the broad tasks and responsibilities involved with these plans. Total funding for the program from HHS OEP was $14.5 million in 1999 and grew to $17.4 million in 2001.\(^ {61} \) Each new MMRS city in 2002 received only about $400,000. The IOM study reported that with earlier funding contracts, cities were paid as specified deliverables were produced, with an estimated average of about $500,000 per metropolitan area over 18 months.\(^ {62} \) There is little systematic information available on how each city organizes their MMRS. Anecdotal information suggests that cities may have focused on preparation and handling of events of greater likelihood of occurrence, such as chemical hazards and spills and decontamination resulting from these events.

Commentary on the Metropolitan Medical Response System

The MMRS program provides a framework for a preparedness network. However, there has been no assessment of efforts to strengthen the system or to reassess its design and introduce needed modifications in light of the substantial financial and policy support for terrorism preparedness since 2001.

1. Evaluation of the MMRS program.

• Prior to 2001, the MMRS program was considered to be underdeveloped and inadequately prepared to address major mass casualty or bioterrorism events. Several national groups have called for a comprehensive evaluation of the MMRS program since there has not been consistent program oversight or linkage to other relevant state-level or regional programs.

• The DHS ODP State Homeland Security Assessment and Strategy (SHSAS) process that was instituted in July 2003 for states and local jurisdictions may be a source of information.\(^ {63} \) This process has taken an integrated approach. The 2003 program “includes public health as one of 10 disciplines included in an integrated assessment (with Law Enforcement, Emergency Medical Services, Emergency Management, Fire Services, Hazardous Materials, Public Works, Governmental Administration, Public Safety Communication, and Health Care). Officials from each discipline will have an opportunity to highlight areas of need in planning, organization, equipment, training, and exercises.”\(^ {64} \) This information was to be complied and submitted by each state contact person by December

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\(^ {64} \) Centers for Disease Control and Prevention, *Statewide homeland security grants program*, 2003
2003. It is unclear whether and to what extent the MMRS programs will contribute to the state reports.

2. **Local coordination between the MMRS and relevant NDMS or state emergency management programs should be assessed using performance standards or goals.**
   
   - The functions required of the MMRS program closely relate to the activities of the NDMS and DMATs. Thus it seems that a stronger MMRS could be developed by supporting relationships with any NDMS voluntary hospitals or local DMATs. This would increase the scale of local coordination and bring together the medical expertise for training and readiness to mount a local response.
   
   - A GAO analysis from early 2002 noted the challenges of integrating federal, state, local and private sector efforts. A key finding highlighted the need for clear goals and performance measures, emphasizing the importance of the “establishment of goals and performance indicators to guide the nation’s preparedness efforts. … For the nation’s preparedness programs, however, outcomes of where the nation should be in terms of domestic preparedness have yet to be defined.”

   - The IOM MMRS study includes an assessment of the MMRS integration with NDMS as a preparedness indicator for evaluating the MMRS program.

3. **MMRS could play a major role, as a participant or coordinating body, in local metropolitan area response planning. Yet it is uncertain to what extent the 122 MMRS programs view this as an opportunity.**
   
   - It is unclear how well each MMRS program functions in relating to key local organizations such as the major hospitals, academic health centers, health care systems, health care professionals, and others in their community.
   
   - From the perspective of a national healthcare organization, there is a need for greater coordination of community response systems, "Managing a mass casualty or bioterrorism situation is no job for a single provider organization. This is, in fact, the responsibility of ‘the community’ – an as yet ill-defined composite that, at a minimum, includes emergency medical services, fire, police, the public health system, local municipalities and government authorities, and local hospitals and other health care organizations." The MMRS could serve an important community role by virtue of its federal mandate, yet it is unclear if this role is something that MMRS programs currently considers as part of their mandate.

**Chapter Conclusion**

These systems form the core national medical emergency response system and are critical parts of the overall strategy to minimize the consequences of terrorist attacks and other large-scale disasters. All programs were transferred from HHS to DHS in March 2003 and are housed

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66 Joint Commission on Accreditation of Healthcare Organizations, *Health Care at the Crossroads*, 2003, p. 10
in the DHS Division of Emergency Preparedness and Response. The plans for program evaluation are not clear at this time. It does appear that are opportunities for improvements in the national response systems, ranging from better planning and coordination to more effective and ongoing program evaluation and monitoring.

A critical element for the success of these programs is the personnel involved, including their numbers, distribution, and training and competency. Thus the subject of the next chapter is the training of the professionals needed to make the systems function.
Appendix 2  NDMS Maps

2.1 Map of NDMS Federal Coordinating Centers - 2002

In 2002, there were 65 Federal Coordinating Centers, located near military airfields or VA hospitals. Each FCC and collaborating hospital must be located within 50 miles of an airfield to allow for timely patient transport. See map, below.

Source: National Disaster Medical System, 2002
2.2 Map of DMAT and Burn Team Locations
The first two maps below show the location of DMATs as of 2000. Team numbers include the State abbreviation and a number indicating when the teamed was organized by state.

Map 2.21 Geographic Distribution of Level 1 DMATs – Year 2000

Map 2.22 Geographic Distribution of Level II and III DMATs

Map 2.23 Geographic Regions for the Five Burn Specialty Teams
BST-1, Boston, MA; BST-2, Gainesville, FL; BST-3, Galveston, TX; BST-4, St. Paul, MN; BST-6, Sacramento, CA

Burns Teams

Teams designated by the American Burn Association’s (ABA) Regions:
BST-1, ABA Region I & II; BST-2, ABA Region III & IV; BST-3, ABA Region VI & VII; BST-4, ABA Region V & VIII; BST-6, ABA Region IX & X

Appendix 2.3 DMATs by level, team name, sponsor, and location, with Web links as of December 2002.

<table>
<thead>
<tr>
<th>Level</th>
<th>DMATs</th>
<th>Sponsors</th>
<th>City</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Alabama AL-1</td>
<td>Birmingham VA Medical Center, UAB Center for Disaster Preparedness</td>
<td>Birmingham, AL</td>
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<td>3</td>
<td>AL-2 Huntsville</td>
<td>University of Alabama School of Medicine</td>
<td>Huntsville, AL</td>
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<tr>
<td>3</td>
<td>AL-3 Mobile</td>
<td>Mobile County Emergency Management Agency, Mobile Fire-Rescue Department, Mobile County Public Health Department, Southwest Alabama EMS, Inc.</td>
<td>Mobile, AL</td>
</tr>
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<td>Alaska AK-1</td>
<td>Alaska Disaster Response Services, Inc.</td>
<td>Anchorage, AK</td>
</tr>
<tr>
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<td>Arkansas AR-1</td>
<td>Arkansas Department of Health, Division of EMS &amp; Trauma Systems</td>
<td>Danville, AR</td>
</tr>
<tr>
<td>3</td>
<td>AZ-1 Tucson</td>
<td>The University of Arizona Health Science Center</td>
<td>Tucson, AZ</td>
</tr>
<tr>
<td>1</td>
<td>California CA-1</td>
<td>Western Medical Center</td>
<td>Santa Ana, CA</td>
</tr>
<tr>
<td>1</td>
<td>California CA-2</td>
<td>San Bernardino County</td>
<td>San Bernardino, CA</td>
</tr>
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<td>California CA-4</td>
<td>County of San Diego California/ EMS</td>
<td>San Diego, CA</td>
</tr>
<tr>
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<td>California CA-6</td>
<td>Contra Costa County Health Services Department/ EMS</td>
<td>Martinez, CA</td>
</tr>
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<td>County of Los Angeles</td>
<td>Commerce (Los Angeles), CA</td>
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<td>CA EMSA</td>
<td>Sacramento, CA</td>
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<td>Denver, CO</td>
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<td>Ft. Walton Beach, FL</td>
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<td>Florida FL-2</td>
<td>American Red Cross, Charlotte County Chapter</td>
<td>Ft Myers, FL</td>
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<td>2</td>
<td>Florida FL-3</td>
<td>Tampa Bay Regional Disaster Network, INC.</td>
<td>Hudson, FL</td>
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<td>3</td>
<td>Florida FL-4</td>
<td>SHANDS Jacksonville</td>
<td>Northeast Florida, FL</td>
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<td>Florida FL-5</td>
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<td>Pembroke Pines, FL</td>
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<td>2</td>
<td>Florida FL-6</td>
<td>Central Florida Disaster Medical Assistance Team, Inc.</td>
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<td>Georgia GA-3</td>
<td>Southern Regional Medical Center</td>
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<td>3</td>
<td>Augusta GA-4</td>
<td>The Medical College of Georgia</td>
<td>Augusta, GA</td>
</tr>
<tr>
<td>1</td>
<td>HI-1 Wailuku</td>
<td>Maui County Emergency Services Rapid Deployment Team and Hawaii Department of Health</td>
<td>Wailuku, HI</td>
</tr>
<tr>
<td>Level</td>
<td>DMATs</td>
<td>Sponsors</td>
<td>City</td>
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<td>-------------</td>
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</tr>
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<td>3</td>
<td>IA-1 Dubuque</td>
<td>Heartland Regional Paramedic Services</td>
<td>Dubuque, IA</td>
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<td>ID-1 Boise</td>
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<td>Boise, ID</td>
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<td>1</td>
<td>KY-1 Fort Thomas</td>
<td>St. Luke Hospital, Inc.- Fort Thomas, Kentucky</td>
<td>Fort Thomas, KY</td>
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<td>NJ-1 Lyons</td>
<td>New Jersey Trauma Center Council, Lyons VA Hospital</td>
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<td>New Mexico NM-1</td>
<td>The University of New Mexico School of Medicine's Department of Emergency Medicine</td>
<td>Albuquerque, NM</td>
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<td>New York NY-2</td>
<td>Westchester Medical Center</td>
<td>Valhalla, NY</td>
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<td>NY-4 Rockland County</td>
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<td>Winston-Salem, NC</td>
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<td>Massachusetts MA-1</td>
<td>The City of Boston, Department of Health and Hospitals, Emergency Medical Services</td>
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<td>MA-2 Worcester</td>
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<td>1</td>
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<td>Westland, MI</td>
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<td>MS-1 Brandon</td>
<td>Rankin County Fire Services</td>
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<td>Nevada NV-1</td>
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<td>Ohio OH-1</td>
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<td>Toledo, OH</td>
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<td>The College of Osteopathic Medicine, Oklahoma State University</td>
<td>Tulsa, OK</td>
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<td>Oregon Disaster Medical Team</td>
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<td>Oregon Health Sciences University -Oregon Health Division</td>
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<td>Pennsylvania PA-1</td>
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<td>PR-1 San Juan</td>
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<td>Sponsors</td>
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<td>Bryan, TX</td>
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<td>TX-3 Galveston</td>
<td>Gulf Coast Training Center</td>
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<td>2</td>
<td>TX-4 Metroplex</td>
<td>V.A. North Texas Health Care System</td>
<td>Dallas, TX</td>
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<td>VA-1</td>
<td>The City of Norfolk Department of Fire-Rescue</td>
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<td>1</td>
<td>WA-1 Seattle</td>
<td>Seattle King County Disaster Team</td>
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### Appendix 2.4: The Metropolitan Medical Response Systems – Location of Jurisdictions

![MMRS Jurisdictions](image)

<table>
<thead>
<tr>
<th>State</th>
<th>Jurisdiction</th>
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<td>Alabama</td>
<td>Birmingham, Huntsville, Mobile, Montgomery</td>
</tr>
<tr>
<td>Alaska</td>
<td>Anchorage, Southeast Alaska</td>
</tr>
<tr>
<td>Arizona</td>
<td>Glendale, Mesa, Phoenix, <a href="#">Tucson</a></td>
</tr>
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Chapter 3: TERRORISM PREPAREDNESS TRAINING FOR HEALTH PERSONNEL

“Until recently, the public and private health sectors have been largely excluded from the Nation’s bioterrorism preparatory efforts. The very group that would handle the consequences of an attack has yet to receive widespread education on the topic.”

--Johns Hopkins Evidence-based Practice Center

It is not possible to prevent all terrorist acts, let alone disasters such as plane crashes and earthquakes. But it is possible to minimize the consequences of such events through timely and effective disaster response. The previous chapter described the major components of the two national disaster response systems with a focus on the organization, coordination, and operation of the systems. But what about the individuals who make the systems work? Who are they? Where do they come from? And, most important, how are they trained to deal with disaster-caused medical emergencies?

Prior to September 11, there was limited consideration of the role of medical and health care professionals in terrorism training programs. Medical personnel involved in disaster response—physicians, nurses, and others—need training, since the knowledge and skill needed at a disaster scene have not been part of the professionals’ routine training. Such knowledge and skill includes scene assessment, systematic management of the overall response, the search for and rescue of victims, patient assessment and triage, and field medical treatment. Care of casualties transported to hospitals for definitive care requires triage skills, including challenging logistical considerations if there are large numbers of casualties.

Public health personnel must be prepared to assist with both the immediate disaster and with the longer-term population health impact. Thus they may assist with the immediate medical response and management functions, as well as with tracking and analyzing data on casualties. Many of their functions extend beyond the immediate disaster site and include communicating health-related information and advice to the public and providing for sample testing in public health laboratories. Public health and environmental units assess effects on the environment (air quality, radiation, toxic exposures), water and food supplies, and on sanitation systems. Public health staff, or volunteer physicians, nurses, pharmacists, counselors, and others, may organize immunizations and pharmaceutical distribution; secure medical care for those who have had their regular medical care disrupted; organize mental health and counseling care for families of casualties, first responders, and others in need; and manage the handling of the dead and any residual hazardous materials.

The heroic actions shown by fire and rescue teams and other first responders on September 11th illustrated the important role of these individuals in disaster response. Traditional first responders include police, fire, and emergency medical services personnel (para-

67 Johns Hopkins Evidence-based Practice Center, Training of Clinicians, 2002.
medics and emergency medical technicians [EMTs]). First responders are trained to respond rapidly to calls for emergency assistance and to provide immediate rescue efforts for emergencies and disasters, such as motor vehicle crashes, fires, building collapses, chemical hazard spills, and large-scale tragedies such as airplane crashes and terrorist attacks. The term “first-responders” generally has referred to the “pre-hospital” care providers and has not included the medical personnel that are based in a hospital, such as emergency medicine physicians and nurses.

This chapter begins with descriptions of terrorism preparedness training programs for these emergency first responders. The next sections describe examples of federally sponsored and privately sponsored terrorism response training programs for health and medical personnel. The final sections draw findings from this review and discuss issues calling for continued attention.

Traditional First-Responders and Emergency Management Personnel

Estimates of the numbers of first responders in the United States include about 1.7 million firefighters (both volunteer and paid staff), about 620,000 police and other law enforcement personnel, about 175,000 fulltime EMTs and paramedics, and an additional estimated 500,000 volunteer, part-time EMTs. Many emergency medical services (EMS) units are sponsored by local fire departments and many firefighters have some level of EMT training, although this varies widely. Police commonly have basic first aid training and may have further EMT training.

Since the mid-1990s, several federal agencies have sponsored terrorism preparedness training for these first responders and for emergency management personnel. Responsibility for training has shifted across federal agencies over the past five years as directed by federal legislative mandates, administrative decisions, and the availability of funding. From about 1998 through 2001, three federal agencies conducted emergency response training programs: FEMA, the Department of Justice (DoJ), and the Department of Defense (DoD). These programs trained over 273,000 individuals who were first responders. (See the chart in Appendix 3.1 at the end of this chapter.) A compendium of emergency response training courses sponsored by the federal government was published in January 2000. It included over 100 individual courses. These programs were often considered to be in the “train the trainer” model. The courses were taught using various techniques and tools, they were often offered on site, and they frequently used computer-based learning techniques. The following descriptions illustrate some of the training offered by these agencies and, more recently, by the DHS.

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70 Federation of American Scientists, 2002.
**FEMA Training for Emergency Managers and First Responders:** FEMA has sponsored extensive training programs at facilities they operate in Maryland (the Emergency Management Institute and the National Fire Academy). These facilities provide programs for local, state, and federal emergency managers and first responders. Courses cover management topics such as emergency planning and disaster management, hazardous materials response, fire service management, and exercise and training design and evaluation. FEMA courses have been provided through emergency management agencies (EMAs) in each state. In late 2001, FEMA worked with the states to develop plans for terrorism preparedness training and equipment needs for chemical and biological threats. These plans were used to help allocate first responder grant assistance provided in the 2002 *Emergency Supplemental Appropriations Act*.

**DoJ Office of Domestic Preparedness (ODP):** The DoJ Office for Domestic Preparedness (ODP) has offered training and technical assistance for state and local emergency responders, often through distance learning programs. In May 2000, the ODP sponsored a large-scale exercise to test the readiness of top government officials (hence its name TOPOFF) to respond to terrorism outbreaks staged at multiple locations. This exercise was carried out in three cities, portraying a chemical terrorism event in Portsmouth, NH, a radiologic event in Washington DC, and an outbreak of bacterial plague in Denver, CO. This type of well-planned simulation drill is considered to be a useful learning experience that comes much closer to real-life disaster/terrorist attack challenges than any other training format. In 2003, ODP was transferred to the DHS and continues to carry out a training mission.

**DoD Special Programs for Non-Military Personnel:** The DoD has extensive experience with training military personnel and has had significant resources available for civilian first responder training. DoD involvement in civilian training came about in part from legislation in 1997 (PL 104-201) that required the DoD to enhance the capability of federal, state, and local emergency responders regarding terrorist incidents involving WMDs and high yield explosives. This legislation led DoD to create a Domestic Preparedness Program that offered the mandated training to large cities, providing exercises on biological warfare responses and other emergency response training and assistance. These cities became the core cities for the Metropolitan Medical Response System. Several of these programs were transferred to the DoJ in 2000.

The DoD continues to be a critical resource for military and civilian response programs and has offered courses for non-military personnel through several specialized institutes. These include special training for bioterrorism at the U.S. Army Medical Research Institute of Infectious Diseases and training on the handling of chemical agent attacks at the Medical Research Institute of Chemical Diseases. Civilians working with the military, as well

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as the National Guard, have also been provided emergency response training at the National Interagency Civil-Military Institute.  

**DHS Management of Emergency Responder Training:** DHS offers various emergency response training for national and state and local governments through ODP. The ODP Web site lists the consortia and private training facilities that it uses and supports to carry out many of its training programs (see Appendix 3.2 at the end of this chapter). The Homeland Security Exercise and Evaluation Program (HSEEP) provides financial and other direct support to assist state and local governments with the development and implementation of programs to assess and enhance their domestic preparedness. HSEEP oversees full-scale exercises such as TOPOFF 2, which was conducted in May 2003 as a five-day exercise simulating terror attacks from a radioactive dirty-bomb blast in Seattle and an outbreak of the plague in Chicago. Congress mandated these exercises. TOPOFF 2 involved 18 Federal departments and agencies (including the Department of State), several states and municipalities, the Canadian Government, and the Province of British Columbia. DHS Secretary Tom Ridge stated, “Protection against terrorism requires that organizations at every level of government and in the private sector work together in partnership to prepare for events and to deal with their consequences. TOPOFF 2 provides the opportunity to test our preparedness, and at the same time identify ways to improve response in the future.”  

**Health and Medical Personnel**

Terrorism related medical response training for health professionals was very limited prior to September 2001. Health and medical personnel had largely been left out of federally sponsored programs that were geared toward first responders as described above. The analytic literature on training medical and health professionals for terrorism preparedness is itself limited. There has been one comprehensive review of the literature on the effectiveness of training health professionals for bioterrorism, and there have been no similar analyses of training for other types of terrorist attacks.

However, federal agencies have offered or contracted for training programs for many types of health personnel that work in federal or state agencies or other relevant programs. A selected representation of these programs and sponsors are described below. Private groups, usually professional associations or consortia, including academic institutions, have also developed training for their member or other specific audiences. Selected examples of these programs are also described.

**NDMS Personnel:** The NDMS Response Teams Training Program has been developed and offered via distance learning through contract with the University of Maryland-Baltimore

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77 National Interagency Civil-Military Institute, 2003  
This group has worked with disaster experts and educational specialists to plan and design a series of educational modules covering a wide range of disaster preparedness topics. A series of more than 50 distance-learning modules have been developed and made available to NDMS staff and medical response team members. In 2002 and 2003, limited field training was initiated. In addition to this training, DMATs plan their own local exercises and drills. The NDMS annual conferences have extensive training program offerings (almost 100 sessions) covering all aspects of preparedness training and updates, offered by national and regional experts.

Department of Veterans Affairs (DVA): The Veterans Administration (VA) of the DVA sponsors emergency response training for personnel at VA medical centers and as part of the Veterans Integrated Service Networks (VISNs), NDMS, and the VA/DoD Contingency Hospital System. Each year the VA coordinates several hundred emergency-response training exercises, ranging from local to large federal exercises. The VA Disaster Emergency Medical Personnel System (DEMPS) is a database containing information on VA medical personnel who have volunteered for deployment in the event of a natural or manmade disaster. The VA utilizes their Emergency Management Strategic Healthcare Group (EMSHG), headquartered at Martinsburg, West Virginia, along with a national group of Area Emergency Managers (AEMs), as advisors for VA participation in emergency response training.

Commissioned Corps Readiness Force: The Commissioned Corps Readiness Force (CCRF) is a team of U.S. Public Health Service (PHS) Officers who are specially trained and can be deployed to critical events, public health emergencies, or in response to other requests for assistance. These individuals are recruited from the PHS Commissioned Corps, a uniformed service branch composed of officers who work in federal agencies. The CCRF has about 1,400 officers who are physicians, nurses, pharmacists, engineers, scientists, therapists, dietitians, and environmental health specialists, among others. The CCRF was created in 1994 and reports to the Office of the Surgeon General (OSG). Medical response training for the CCRF has been offered through the distance learning models developed by the University of Maryland.

Centers for Disease Control and Prevention (CDC) Programs for Bioterrorism Preparedness: The CDC has offered terrorism training, particularly for bioterrorism (BT) preparedness, through several programs sponsored by the CDC Bioterrorism Preparedness and Response Pro-

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80 University of Maryland Baltimore County, NDMS response team training program, 2003.
81 Richard Bissell, Assistant Professor, Disaster and International EMS, UMBC, personal communication.
83 Bruce Young, EMSHG National Exercise Coordinator, Department of Veterans Affairs, personal communication, September 26, 2002.
84 University of Maryland Baltimore County, CCRF response team training program, 2003; Angela Martinelli, Medical Readiness Manager/Response Coordinator, Commissioned Corps Readiness Force, USPHS Rockville MD, personal communication, September 26 2002.
gram and the Emergency Preparedness and Response Programs of the Public Health Training Network (OHTN) of the Public Health Practice Program Office (PHPPO).

In 2000, a national training plan for bioterrorism response recognized that priority needs should drive the three-phased training plans. The plan included a first phase for CDC personnel, beginning with senior leaders; the second phase would address the needs of front-line public health practitioners; and the third phase would address the BT preparedness needs of the general public health workforce (about 500,000 individuals). Also in 2000, the CDC issued recommendations from an internal strategic workgroup that outlined critical preparedness steps (planning, detection and surveillance, laboratory analysis, emergency response, and communications) and noted the importance of training public health and healthcare personnel within and outside of government.

The issues that must be addressed to improve the public health infrastructure and to adequately address bioterrorism and public health emergencies preparedness are complex and involve many programs and stakeholders. The CDC has received major funding that is distributed through contracts with all states and a small number of large metropolitan areas to increase state capacity to detect and respond to bioterrorism or other related incidents. This funding supports staff increases, laboratory capacity, training, communications, and other infrastructure development activities. CDC funding levels for these activities increased dramatically, from about $41 million per year in 1999 and 2000 to $918 million in 2002 and about $870 million in 2003.

The CDC PHPPO funds several different types of training centers. These centers provide distance learning, develop learning materials, on-site training, and also conduct preparedness-relevant research. The centers include:

- 21 academic centers for public health preparedness located in schools of public health, offering on-site training on various public health topics and distance-learning modules.
- 13 specialty centers for public health preparedness, located in academic institutions or academic collaboratives or special facilities that conduct research, offering training and developing learning materials for topics such as emerging biological threats, law and the public’s health, food production and security, psychosocial aspects of bioterrorism, dangerous pathogens, molecular epidemiology and forensic tracking, emergency response and rescue training, and basic and advanced disaster life support training.

**Health Resources and Services Administration (HRSA) National Bioterrorism Hospital Preparedness Program:** In 2002, HRSA was the lead HHS unit for a new hospital bioterrorism preparedness program that distributed $125 million under cooperative agreements with each state and five metropolitan areas. The funding level was increased to $498 million in 2003. States

were to use these funds and to distribute a portion to various regional or local groups. States were asked to conduct needs assessments and to develop regional hospital plans to respond to terrorism or large disease outbreaks. States also were asked to establish planning committees and to take other steps to increase the overall capacity among hospitals, EMS systems, and other health care facilities to respond to terrorist attacks (including an infectious outbreak with 500 or more patients). Training of hospital and other health and medical personnel is one of seven priority areas required by HRSA. However it is unclear to what extent such training has actually been planned and carried out.

Private Sector Training and Preparedness Efforts

Shortly after September 11--and particularly after the October 2001 bioterrorism attacks with anthrax--many health professional groups took steps to urgently inform their members about bioterrorism agents. The CDC provided national leadership and took immediate steps to encourage the widespread education of physicians and other health care providers about bioterrorism, using Web site postings, interactive live and Web cast educational sessions with national experts, and other approaches. Many national, state, and local health professional associations partnered and supported these efforts, using their Web sites to present information and link to useful federal sites and publishing relevant articles in their journals or newsletters. Health care leaders and health care systems sought information for better preparation of their staffs and facilities. As noted above, federal funding from the CDC and HRSA became available to plan, organize, train, and equip public health and hospital-based personnel. Public health, health care, and policy leaders recognized that the nation urgently needed to take steps to protect the country from bioterrorism with lethal agents. As described above, Congress passed comprehensive bioterrorism legislation and authorized substantial funding through multiple channels.92

Yet, before the United States was actually attacked, the attention that the medical care sector and educators gave to terrorism preparedness was very limited. The programs that are described below constitute a small selection of the health professional training efforts that were in process before, or were initiated shortly after, the 2001 attacks. They are presented to illustrate several concepts for training programs: the need to deal with learners at several levels; the importance of a thoughtful design process and approach to training; the critical role of collaborative groups; the connection of training to a simple certification process in basic and advanced disaster life support; and an approach to present basic information available to large numbers of professionals.

**American College of Emergency Physicians**: Before the 2001 attacks, the American College of Emergency Physicians (ACEP) completed a comprehensive federally-funded study which underscored the lack of training for emergency medicine professionals to respond to terrorist attacks, particularly those caused by nuclear, biological, or chemical agents.93 The ACEP study also produced a set of training objectives and suggested course content and

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92 Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (PL 107-188)
measurable competencies that have since served as a model for others. The target audience for the training included the following.

- The 32,000 emergency physicians working in 5,000 Emergency Departments across the country. Only about 60 percent of these physicians—commonly those working at large teaching or other urban hospitals—are trained in emergency medicine.\(^{94}\) Physicians in smaller and rural hospitals may have trained in family medicine or other specialties and would have less specialized training in emergency care.
- The 90,000 emergency nurses working in Emergency Departments. These nurses may or may not be certified by the Board of Certification for Emergency Nursing.
- An estimated 700,000 Emergency Medical Technicians (EMTs). These EMTs may work as volunteers or paid employees of private ambulance companies or local fire departments. Educational levels vary and training certification has three levels (EMT-basic, EMT-intermediate, and paramedic).

In 2000, under a contract from the federal government, the ACEP created a task force to assess and develop a training curriculum for emergency medical providers in nuclear, biological, or chemical incidents. The task force was comprised of 26 members representing organizations from government, medical associations and medical provider groups (including the HHS OEP, American Board of Emergency Medicine, American College of Medical Toxicology, American Hospital Association, American Nurses Association, Association for Professionals in Infection Control and Epidemiology, Emergency Nurses Association, International Association of Fire Chiefs, National Association of Emergency Medical Services Physicians, and others).

The task force conducted a needs assessment and reviewed educational curricula and individual courses for a variety of target audiences, developed educational objectives and definitions of levels of proficiency, drafted recommendations for integrating weapons of mass destruction content into initial and continuing education programs, and suggested ways of sustaining knowledge and skills to ensure continuing emergency response proficiencies. The task force emphasized the importance of including a variety of relevant groups in planning and conducting training programs and suggested including hospital administrators, local and state emergency planners, law enforcement officials, poison center staff, laboratory agency staff, industry representatives, public health leaders, safety officers, and medical specialists. The task force also suggested that training programs should be specifically targeted for each learner group, with objectives related to the material they need to know and the skills they need to use.

**National Health Professions Preparedness Consortium:** The National Health Professions Preparedness Consortium (NHPPC) grew out of the International Nursing Coalition for Mass

Casualty Education at the Vanderbilt University School of Nursing. Other university programs (University of Alabama at Birmingham’s Center for Disaster Preparedness and Louisiana State University’s National Center for Bio-Medical Research and Training) joined with Vanderbilt in the Consortium. 95 The goal of the NHPPC is to address emergency response preparedness for a large number of health professions groups. The NHPPC has adopted the curriculum and objectives of the ACEP task force study and report. The Consortium provides and sustains the operational training, exercises, testing, evaluation, and leadership necessary to effectively deal with the health care impacts of large-scale disasters. The Consortium has used the Noble Training Center, a specially equipped former Army hospital in Alabama for training. 96

Disaster Medicine Life Support Education Consortium: Several academic medical centers, emergency medicine physicians, and others with expertise in disaster management formed the National Disaster Life Support Education Consortium to respond to the need for a national all-hazards disaster training course. Many groups are collaborating partners with this effort. 97 The training builds upon programs developed at the Medical College of Georgia for basic and advanced disaster life support. These programs were developed in the 1990s and modeled after advanced cardiac life support (ACLS) training. The programs offer all-hazards disaster didactic and skills training in a format that can be completed over a weekend, or via distance learning, or in a full day course. The Consortium plans to develop a National Life Support Course with a focus on logistics and systems issues during a disaster, as well as a Community Disaster Life Support Course targeted for first responders and the general public. 98 Although these programs prepare participants for disasters, the knowledge and skills will be useful for terrorism response readiness as well.

American Pharmacists Association (APhA): There are about 200,000 active pharmacists in the United States. They can be involved as community resources for medical responses to chemical, biological, and nuclear agents. Many pharmacists were involved with the anthrax outbreak (antibiotic prophylaxis for healthy individuals exposed to anthrax spores) and with disaster-preparation distribution and handling of large pharmaceutical stockpiles and smaller local medication inventories. 99

The American Pharmacists Association (APhA) has offered a two-hour continuing education program for its members on Biological and Chemical Terrorism Health Care Implications. Another training course prepares pharmacists to participate in the delivery of care during a mass prophylaxis campaign as part of an integrated team (e.g., physicians, nurses, physician assistants, pharmacists). Such teams may use the Strategic National Stockpile, a

95 Vanderbilt University School of Nursing, 2003.
96 University of Alabama at Birmingham, Center for Disaster Preparedness, 2002, p.1. Also Guillot, S.L., 2002
98 Ibid.
massive stock of pharmaceuticals, vaccines, and other supplies and equipment that can be shipped by cargo plane to disaster sites.

**Commentary on Terrorism Preparedness Training Programs**

This chapter presents a small snapshot of the types of programs that have been developed for various target audiences over the last several years. This overview does not adequately portray the richness of the programs or details of the efforts that have been required to achieve the current state of training and preparation. This commentary briefly summarizes several general conclusions that follow current thinking on preparedness planning and training.

A limitation of training programs supported by earlier WMD legislation was that they often imposed categorical eligibility for trainees. Thus while several pieces of legislation appropriately recognized the importance of training first responders such as firemen, police, and EMTs, these same programs generally did not include medical personnel based at hospitals, medical centers, and clinics. In retrospect this was a significant omission.

A second limitation of earlier training was a focus on training in specific classes of agents or weapons, rather than in all possible hazards. The rationale for this segmentation seems to have been that staff protection, victim decontamination, and/or medical treatment differ by the attack agent. An all-hazards approach includes readiness to respond to a biological, chemical, radiological, nuclear, or other mass casualty/mass destruction attack. Such an approach provides for great efficiencies and flexibility, as noted in this IOM commentary.

“In the past, localities developed individual plans for each type of hazard, with separate mechanisms to respond to each. A community would have separate plans for tornadoes, flooding, severe storms, nuclear emergencies, and industrial explosions. Emergency management professionals have recognized that a range of management functions is common to all incidents and that the availability of a single set of systems for managing emergency responses is advantageous… communities benefit from cross-training, increased efficiency, and avoidance of duplication. The process of developing an all-hazards plan also promotes coordination across organizations, prevents conflicts in planning, and avoids gaps in disaster response. Emergency management formulated on the basis of multiple hazards also promotes flexibility and an increased ability to respond to the unexpected.”

It would clearly make sense to implement the all-hazards approach as widely as possible, both in training and in practice.

A third training limitation, which could affect future planning as well, has been the failure to fully recognize the importance of learning about the roles of others on the team or at

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100 Institute of Medicine, *Biological Threats and Terrorism*, 2002, p. 34-35.
the disaster site, etc. Effective training must not only cover the specifics of what each profession must deal with but also how various sectors fit together. For example, health care specialists with police, safety, and security officials; emergency medical technicians with community nurses or pharmacists; office based physicians with public health staff or emergency management personnel.

Finally, efforts to develop effective emergency response training programs need to be based on evaluation of the effectiveness of existing training programs. Unfortunately, little information on effectiveness is available. An evidence-based analysis of the published information on the training of health professionals for bioterrorism preparedness concluded that “little information exists about preparing clinicians for such unusual public health emergencies as bioterrorism.” Yet even when the researchers focused more broadly to include training that prepared clinicians to deal with “infectious disease outbreaks, toxidromes, or mass poisoning events, catastrophic events that incite fear and mass hysteria, and incidents that require use of hospital disaster plans,” they found little information on training effectiveness. Their review of over 1,900 citations and in-depth study of 60 reports concluded that only modest evidence was presented on the effectiveness of training for the detection and management of an infectious outbreak, minimal evidence was available on the assessment of training for responding to events similar to bioterrorism, and essentially no evidence was available assessing training for skills such as using information resources, communication with other professionals, and the reporting of events or cases. The group recommended that increased attention be devoted to including evaluation of effectiveness in training programs.

Chapter Conclusion

There is a need to expand emergency medical response training programs. But the educational task is mammoth. Content continually changes; busy practitioners have little time to devote to this area; federal support is uneven; some training requires field exercises; and, even with the best content, it is content delivery that remains the key issue. But the failure to face and surmount these difficulties can easily lead to consequences too horrible to contemplate.

Looking forward, one of the most important needs is to gain efficiency with the training process. One approach would be to explore with the current well-organized groups whether their products could be shared with others needing training, such as University of Maryland sharing its modules with other approved groups or individuals. Creative approaches to reach and engage busy practitioners (adult learners) is necessary and worth the time. Effective delivery of the learning messages should be assessed; the use of engaging and active learning approaches should be encouraged. Drills and exercises, if well designed, can provide hands on experiences. As noted above, creative ways to evaluate the effectiveness of training must be incorporated into any funding awarded for new training programs and should be strongly encouraged for existing programs. There should be support

for multidisciplinary conferences for educators and others to present their programs and analyses, thereby engaging those in the field (e.g. NDMS, DoD, CDC, DHS staff and others) with the educators.

A model that might be emulated is the national coalition that has developed to educate health professionals about the new genomic medicine. Originally sponsored by two major health professional association (the American Medical Association, AMA, and the American Nurses Association, ANA), and the NIH research institute for the human genome project, this coalition receives federal and private foundation support.\(^{102}\) It has grown to over 125 organizational members (many health professional associations), sponsors an annual meeting and takes other steps to share and support the training of health professionals in a field that is complex and slowly being integrated into clinical medical care.

At the national level, there needs to be discussion and strategic thinking about the long-term strategy to plan for various levels of disaster-response competency and responsibility among health professionals and the broad health workforce. Currently, there is no high level, national advisory group charged with this responsibility. Ideally the leaders of DHS and HHS would jointly appoint such a group. Membership could include leaders from the private health care and professional education sectors, representatives of major health and medical professions, experts involved with terrorism preparedness, and key federal and state agency leaders. A well-constituted group with an appropriate charge and sufficient staffing support could serve as a focal point for considering options and advising on a long-term strategy for health workforce terrorism preparedness.

Another issue to be considered is how to develop a broader group of health professionals that can serve as the leaders and experts in the field of disaster and terrorism preparedness and response. The number of health professionals that currently fit this description is small and poorly defined. One approach could be focused at the profession-level and another at the individual level. At the profession level, relevant and interested professions could be encouraged to consider developing training tracks or certification programs that would support and recognize the acquisition of special expertise. For example, among physicians, this might include groups with different but relevant roles, such as emergency medicine physicians, preventive medicine physicians, trauma surgeons, infectious disease specialists, medical and pediatric internists, and family medicine physicians. This approach could also be adopted by relevant nursing specialists, such as emergency nurses, nurses in intensive care and burn units, public health nurses, etc.

The individual-level approach would encourage greater involvement of health professionals that have special personal or professional interest in serving as volunteer DMAT team members. The DMAT programs allow individuals to self-select for team membership and to maintain skills through training, drills, and actual deployments. Few health professionals know about the DMAT program, and many of the DMATs need more members. Thus support to “market” DMATs to senior trainees or practitioners at professional meetings should be considered. As new DMATs are established, particularly those in metropolitan ar-

\(^{102}\) National Coalition for Health Professions Education in Genetics, 2003
eas with a density of health professional trainees, the DMATs should consider developing formal relationships with practitioners at academic health centers, who could also serve as educators and role models within their own institutions for individuals who have interests in this area.

<table>
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<th>Trainees 1998</th>
<th>Trainees 2000</th>
<th>Total Trainees</th>
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<td>FEMA Fire Academy and Emergency Management Institute</td>
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<td>72,873</td>
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<td>Total number trained</td>
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Appendix 3.2 training Programs of the Office for Domestic Preparedness, U.S. Department of Homeland Security

Training

ODP's utilizes the capabilities of a number of specialized institutions in the design and delivery of its training programs. These include private contractors, other Federal and state agencies, the National Domestic Preparedness Consortium, the National Terrorism Preparedness Institute at St. Petersburg Junior College, the U.S. Army's Pine Bluff Arsenal, and the National Sheriff's Association.

The National Domestic Preparedness Consortium

The National Domestic Preparedness Consortium (NDPC) is the principal vehicle through which ODP identifies, develops, tests, and delivers training to state and local emergency responders. The NDPC membership includes ODP's Center for Domestic Preparedness in Anniston, Alabama, the New Mexico Institute of Mining and Technology, Louisiana State University, Texas A&M University, and the Department of Energy's Nevada Test Site; each member brings a unique set of assets to the domestic preparedness program. The following is brief description of each member and their expertise:

Center for Domestic Preparedness (CDP): The CDP provides hands-on specialized training to state and local emergency responders in the management and remediation of WMD incidents. Located at the former home of the U.S. Army Chemical School, Fort McClellan, the CDP conducts live chemical agent training for the nation's civilian emergency response community. The training emergency responders receive at the CDP provides a valid method for ensuring high levels of confidence in equipment, procedures, and individual capabilities. The CDP offers two training courses of instruction: WMD HAZMAT Technician and WMD Incident Command.

New Mexico Institute of Mining and Technology (National Energetic Materials Research and Testing Center) (NMIMT): NMIMT offers live explosive training including the use of field exercises and classroom instruction. NMIMT is the lead NDPC partner for explosives and firearms, live explosives, and incendiary devices training. NMIMT offers one course of instruction, the Incident Response to Terrorist Bombing course. For additional information on NMIMT courses contact NMIMT at www.emrtc.nmt.edu

Louisiana State University (LSU) (Academy of Counter-Terrorist Education): LSU provides training to law enforcement agencies and focuses its efforts on the delivery of the Emergency Response to Terrorism: Basic Concepts for Law Enforcement Course, and the development and delivery of the Emergency Response To Domestic Biological Incidents Course. LSU offers two courses of instruction, Emergency Response to Biological Incidents and the Law Enforcement Response to WMD Incidents course. For additional information on LSU courses contact LSU at www.ace.lsu.edu

Texas A&M University (National Emergency Response and Rescue Training Center): Texas A&M delivers a set of courses to prepare public officials, emergency medical services, law enforcement, fire protection, and public works for the threat posed by weapons of mass destruction. Courses are developed and designed to provide each specific segment of the emergency response community with the tools needed to accomplish its role in the event of a WMD incident. Additionally, Texas A&M has developed an Interactive Internet WMD Awareness Course for emergency responders. Texas A&M also provides technical assistance to
state and local jurisdictions in the development of WMD assessment plans. These courses are offered: WMD Threat and Risk Assessment, WMD Incident Management/Unified Command, Emergency Response to Terrorism Basic Concepts, Emergency Medical Operations, and WMD Awareness (Internet Course). For additional information contact http://www.teex.com/campus or nerrtc@teexmail.tamu.edu

U.S. Department of Energy’s Nevada Test Site (National Exercise, Test, and Training Center) (NTS): NTS conducts large scale field exercises using a wide range of live agent stimulants as well as explosives. NTS develops and delivers a Radiological/Nuclear Agents Course. NTS, in coordination with ODP, is establishing the Center for Exercise Excellence. The Center will allow NTS to train jurisdictions in the planning and conducting exercises, tailored to the unique threats faced by participating jurisdictions. The Center will provide a critically needed new component of the overall exercise training program, meeting those special exercise needs as the state and local jurisdictions define their exercise priorities. For additional information on NTS courses contact NTS at www.nv.doe.gov/nts/

Chapter 4: KEY FINDINGS AND RECOMMENDATIONS

“It does not take long for complacency to settle in. ... The sense of urgency to prepare has now become a wait and see sense. ... The concept of community-wide preparedness systems is new to most health care organizations. ... But if medical care capacity is already in variable and sometimes scarce supply, planning for unexpected surges in demand becomes all the more critical. So, too, does funding and federal leadership for these efforts.”

-- Joint Commission on Accreditation of Healthcare Organizations

This study looked at the threat of terrorism in the United States and at the nation’s disaster medical response system, describing history and context, organization and coordination, and strengths and weaknesses. Of particular concern to the funders of the study was the medical response workforce needed to provide the nation with an effective disaster medical response system, as well as the training of that workforce.

A number of findings, conclusions, and recommendations were distilled from this study and discussed in the previous two chapters. The recommendations for improvements will be reviewed in the pages that follow, with the hope that they may help guide future progress in the way in which the nation prepares to respond to the medical consequences of large-scale disasters. First to be considered are those things that could be done to improve planning for and coordination of the national disaster medical response capability. Following this are suggestions for ways to more thoroughly integrate disaster medical response with the country’s existing medical care system, including associations of health care professionals and health care institutions. Attention then turns to the specifics of workforce preparation and workforce readiness. Finally, ideas are offered regarding ongoing evaluation of the various components of national disaster medical response coordination and capability.

Improving planning and coordination

The NDMS and the MMRS each provide a framework for a response network. However, there has been inadequate attention paid to strengthening these systems and reassessing their design in light of the substantial financial and policy support for terrorism preparedness since 2001. Prior to 2001, these systems were considered to be underdeveloped and inadequately prepared to address major mass casualty or bioterrorism events. It is not at all clear that the NDMS has an adequate number of staffed hospital beds available to it. Nor have the feasibility and planning steps needed to make these beds available and staffed

to accept large numbers of casualties been described, even in light of current staffing and other challenges known to be facing hospitals across the country. Hospitals join NMDS voluntarily, committing to receive (and be reimbursed for) patients during a disaster. Yet it appears that extra hospital surge capacity is in fact very limited. National shortages of key hospital personnel, particularly nurses, but also pharmacists and technologists, suggest that at the current time hospitals would have great difficulty staffing these designated beds.

More attention to the geographical and organizational coordination of NDMS, MMRS, and the disaster medical response teams is needed. It is not clear how the DMATs relate to the MMRS and how well each local MMRS functions and relates to key organizations such as the major hospitals, academic health centers, health care systems, and others in their community. The geographic locations of DMAT teams have not been planned to assure that Level 1 teams are located according to risk-level criteria. This is a serious maldistribution problem. Large metropolitan areas are considered high-risk areas, yet insufficient numbers of response teams appear to be located in these areas. A terrorist attack may severely disrupt transportation systems, so better geographic distribution of response teams is essential to assure availability of teams where and when needed.

A more rational system would better serve the nation. The Department of Veterans Affairs and the VA health system already have many resources to commit to the federal homeland security effort. VA hospitals are distributed across the country and are located in many metropolitan areas. Thus they could play a major role in organizing and staffing new or expanded DMAT and other teams. Similarly, there are strong medical care system components, such as health care systems and academic medical centers, that should be encouraged to participate in these programs, including sponsoring DMATs, working with their MMRS, and providing a true assessment of their bed-capacity for the NDMS. One approach is to have the nation’s academic health centers (AHCs), which are located in most large metropolitan areas, serve as coordinating groups to organize at least one Level 1 DMAT near each key metropolitan area.

**Integrating with the medical care system**

Given the scale and scope of pressing priorities for the Department of Homeland Security—with their first priority being preventing further attacks—greater involvement by the medical and health care sector will be needed to assure that the medical and emergency response to attacks receives adequate attention and support. This study found a consensus among policy makers and analysts that the NDMS and MMRS do indeed represent the nation’s current strategy for emergency preparedness and medical response. These systems must be strengthened and expanded, yet planning efforts to date have not adequately engaged the major health care systems and health care workforce. In particular, there has been limited contact and coordination between the disaster medical response system and the health care system and health care professionals (other than EMS personnel). The extent of involvement by leaders from the private medical care sector is unclear. Medical and
health care leaders do have a critical role to play in emergency preparedness and response and mechanisms to more fully engage this group need to be identified and implemented.

Leaders from the medical and health sectors need to become familiar with the two medical response systems (NDMS and MMRS) within their local area. At the national level, health care leaders need to identify a process to work with the Department of Homeland Security and the Department of Health and Human Services on the emergency preparedness and response mission and the strategy being pursued by these departments and other federal agencies. The leaders of the nation’s academic health centers (AHCs) and major organized health care systems and professional associations need to be provided with opportunities to become involved. The nation’s AHCs are located in large metropolitan areas and serve as major centers for biomedical research, patient care, and education of physicians, nurses, pharmacists, and other health professionals. These centers are often affiliated with VA hospitals and other large hospitals, clinics, and other medical care facilities.

After September 11th government and hospital officials came to regard hospitals as an integral component in the response to a terrorist event. Yet despite the recent availability of federal funding, the readiness of U.S. hospitals to handle casualties from terrorist attacks may remain limited, weighed down by the press of day-to-day responsibilities. It will take considerable energy and time for hospitals to fully consider and develop their involvement in terrorism response.

To guide the process of integrating disaster medical response with the medical care system it will likely be necessary to have an advisory group drawn from the health and medical sectors. A top priority for such a group would be programs designed to respond to bioterrorist attacks with agents that have person-to-person transmission (such as smallpox). The special features of bioterrorism response planning have not so far been adequately integrated into current federal response program design. The readiness of hospitals to provide care for bioterrorism patients has improved but is still limited. The strategy of transporting ill patients with contagious lethal bioterrorism agents to remote hospitals for care is not realistic. Many training programs are underway to help physicians and other professionals recognize, diagnose, and manage these infectious conditions. But the logistical issues require a different sort of planning and training, requiring national guidance and technical assistance.

The costs of implementing the medical response components of the National Strategy will be substantial, making efforts to identify and implement creative “dual-purpose” strategies very important. Dual-purpose strategies are those efforts that support homeland security and also address other pressing societal threats and problems, e.g., enhanced bioterrorism preparedness can also strengthen the public health and medical response to emerging infectious diseases.

An “all-hazards” approach to disaster medical response efforts is an efficient approach to train for readiness to respond to a biological, chemical, radiological, nuclear, or other mass casualty/mass destruction attack

Workforce preparation and readiness
Establishing and sustaining a well-trained health workforce that can respond to emergencies and disasters requires national attention and strategic planning and monitoring. National shortages of key hospital personnel present an additional challenge to workforce readiness. Every disaster medical response study has noted deficiencies in workforce capacity. Unfortunately, there is no national oversight body focused on workforce preparedness, and the number of health professionals with recognized expertise in terrorism response is small and widely dispersed.

Training program organization, funding, and methodology have been developed in isolation from one another and have no requirement for coordination and single oversight and monitoring. This strategy can lead to redundancy of effort and lack of coordination among the responders.

Prior to 2001 terrorism preparedness training was unavailable to most health professionals. The level and type of training needed should be discussed and planned. A comprehensive review of the staffing of the disaster medical response teams is required. This is essential to provide guidance to various professional groups and educators, gain efficiency with educational and training techniques, and conserve vital resources such as hours spent in training among health professionals. Curricular elements will have to be developed as the principles are worked out (e.g., quarantine principles, care of seriously ill patients outside of hospitals, illness among health care providers and their family members).

Terrorism response involves issues that have not been a part of health care training and will not be known by most faculties. The topics include:

- Unexpected attacks and mass casualties
- Quarantine
- Personnel (especially physicians) and health systems working under government command
- The delivery of care in non-hospital settings
- Functioning with inadequate life saving resources
- Person to person spread of untreatable and potentially fatal infectious diseases
- Risks to health care providers and their families and loved ones
- Societal chaos
- Mental health affects of an attack and the resulting strains on society.

Current emergency response training programs fail to encourage coordination across boundaries. Effective training should cover not only the specifics of what each profession must deal with but also how various sectors fit together, e.g., physicians with pharmacists and health care personnel with police, safety, and security officials.

Training has been undertaken by some public and private groups to help assure that their members or community providers are more capable of responding. These groups have experience in disaster and terrorism preparedness and should be encouraged to work with other health professional groups, educators, and practitioners. Selected medical, nursing, pharmacy, and other allied health professional groups should consider adding a special ex-
pertise to their training, practice, and certification process that recognizes the role of management of disasters, terrorism events, and emerging infections preparedness and response.

A working group could be appointed to discuss and recommend feasible strategies to strengthen workforce readiness. This group will need to present flexible approaches to assist various professions and groups pursuing training. An annual conference, perhaps tied to the NDMS conference, could provide a forum for groups to share experiences across the professions.

**Evaluation**

While much has been accomplished in the past two years to enhance medical and public health preparedness and response, the timing is ideal for a thorough re-assessment of program design and current operations. The transfer of disaster medical response programs to the Department of Homeland Security, which has served to highlight design and programmatic gaps, provides a natural opportunity for an in-depth re-evaluation jointly guided by DHS and HHS. In particular, the effectiveness of medical response training programs needs to be evaluated. Several GAO reports note the importance of setting “national preparedness goals and measurable performance indicators.” Steps have been taken by DHS, through their Homeland Security Exercise and Evaluation Program (HSEEP) to assist state and local governments assessing their preparedness.

The GAO and others have called for performance and outcomes-based goals that can be used to assess terrorism preparedness and training programs. A recognized authority such as the Institute of Medicine, which has already had substantial experience with terrorism related studies, could carry out such a study.

Since preparing clinicians for such unusual health emergencies as bioterrorism is an area for which little evaluation information exists, efforts to assess the effectiveness of disaster medical response training programs can be based in part on evaluation of the effectiveness of other types of training programs.

**Chapter conclusion**

These findings, conclusions, and recommendations show that much needs to be done to correct weaknesses in the current disaster medical response system. Since September 11, the United States has been playing catch up in these important areas. But one should not lose sight of the fact that the Nation does have an existing medical response system with a committed corps of non-health professional first responders and a small number of disaster-prepared health professionals. Moreover, there is a commitment to improving the system, using the experience and the analyses of recent years to provide the insight needed to guide that improvement. Significant resources and effective administration will be required, but it is important to note that the process of strengthening of the Nation’s medical response system is indeed underway.
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