



# Bioterrorism and Health System Preparedness



## Optimizing Surge Capacity: Regional Efforts in Bioterrorism Readiness



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The Agency for Healthcare Research and Quality (AHRQ) is the lead agency charged with supporting research designed to improve the quality of health care, reduce its cost, address patient safety and medical errors, and broaden access to essential services.

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The information helps health care decisionmakers—patients and clinicians, health system leaders, and policymakers—make more informed decisions and improve the quality of health care services.



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### Introduction

Regional bioterrorism planning is critical in the aftermath of the terrorist attacks of September 11, 2001, and the anthrax attacks that followed them. One hospital working alone to prepare for a massive influx of patients in the event of a public health emergency or a bioterrorism attack is not sufficient. Indeed, an entire community by itself might not be able to handle a public health emergency involving mass casualties. When developing plans to mobilize quickly, hospitals need to look at resources both in their communities and beyond.

A June 2003 Web-assisted audio-conference sponsored by the Agency for Healthcare Research and Quality (AHRQ) focused on surge capacity assessment and regionalization of resources to respond to large numbers of people requiring immunization, treatment, or quarantine. The event was aimed at local, State, and health systems policymakers. Panelists included:

- Commander Brad Austin, M.P.H., Hospital Bioterrorism Preparedness Program, Health Resources and Services Administration (HRSA);

- Michael Allswede, D.O., University of Pittsburgh Medical Center Health System;
- Stephen Cantrill, M.D., Denver Health Medical Center; and
- Dena Bravata, M.D., M.S., Project Director of the Stanford–University of California San Francisco (UCSF) Evidence-based Practice Center.

The audio conference also included a question and answer period, during which listeners were invited to submit questions to the panelists.

This issue brief examines regional strategies to identify and mobilize resources to respond to a public health disaster such as a bioterrorist attack. A companion issue brief, titled “Optimizing Surge Capacity: Hospital Assessment and Planning,” explores how hospitals can assess their current capacity and convert it into surge capacity; it is available at [www.ahrq.gov](http://www.ahrq.gov).

### Understanding Surge Capacity

Given the threat of a bioterrorist attack, infectious disease outbreak, or other public health emergencies, hospitals must



prepare for an overwhelming number of patients for either an acute period or over an extended period of time. It is important for the leaders of health care institutions to think about surge capacity as more than just the number of available hospital beds. They need to understand their capacity to handle a public health emergency by examining three categories of resources within their own facilities: beds, staffing, and equipment (Table 1).

In addition, they should be knowledgeable about pharmaceutical caches in local pharmacies until supplies are delivered from the Strategic National Stockpile, and should ensure that communications and information technology are in place to connect health care systems components.

### Addressing Surge Capacity at the Regional Level

Hospitals need to evaluate their surge capacity not only within their own facilities, but also within the context of their communities and at the broader, regional level. Hospitals must identify State and local partners as well as Federal representatives who can work to ensure adequate staffing and bed space in the event of a worst case scenario. Health care facilities should work with all potentially available community resources, including primary health clinics, Veterans Administration hospitals, military medical facilities, and Indian Health Service facilities. “This approach will allow the health system as a whole to manage surge capacity,” said Commander Austin.

**Table 1. Surge Capacity—Categories of Resources**

<b>Beds</b>	Emergency department beds, intensive care unit beds, general beds, mental health beds, and pediatric beds
<b>Staffing</b>	Physicians, nurses, pharmacists, mental health professionals, emergency medical technicians, public health professionals and others
<b>Supplies and Equipment</b>	Pharmaceuticals, personal protective equipment, portable and fixed decontamination systems, isolation facilities, and rapid diagnostic systems

In fiscal year 2003, HRSA’s National Bioterrorism Hospital Preparedness Program will award more than half a billion dollars in the form of cooperative agreements to public health departments in States, territories, and municipalities. The purpose of this program is to upgrade the preparedness of the Nation’s health care system to respond to bioterrorism, infectious disease outbreaks, and other public health threats and emergencies.

“We are tasking hospitals to look at surge capacity from a broader regional level,” said Commander Austin. The definition of a region varies but should accommodate the unique geography and circumstances of an area. Some States define regions using pre-existing emergency aid regions, while others use counties. Under the Bioterrorism Hospital Preparedness Program, HRSA provides surge capacity benchmarks that it asks recipients under this program to plan for (Table 2).

Stephen Cantrill identified several data sources that can help regions determine their baseline capacity, an important first step in preparing for a mass-casualty disaster (Table 3).

### Denver Model for Assessing Regional Capacity

An example of a regional approach that other areas can learn from is the Rocky Mountain Regional Care Model for Bioterrorist Events (RMBT). This AHRQ-funded initiative is designed to identify and address surge capacity needs in the event of a bioterrorist attack. The RMBT project is a collaborative effort among six States in Federal Region VIII (Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming), and relies on the involvement of numerous Federal, State, and local partners.

When completed, the RMBT project will provide tools that other regions



**Table 2. HRSA Surge Capacity Benchmarks**

Hospital beds	Beds for 500 acutely ill patients requiring hospitalization from a bioterrorist incident per million population
Decontamination facility	Adequate portable or fixed decontamination systems for 500 patients and workers per million population
Negative pressure, HEPA-filtered isolation facility	At least one per health system must be able to support 10 patients at a time
Health care personnel	Response system that allows immediate deployment of 250 additional personnel per million population in urban areas System of 125 additional personnel per million in rural areas
Personal protective equipment	Adequate personal protection equipment for 250 additional health care personnel per million population in urban areas Adequate equipment for 125 additional personnel per million in rural areas

**Table 3. Data Sources for Determining Baseline Capacity**

Hospital data	HRSA Hospital Needs Assessments provide information on hospital bioterrorism readiness by State. For more information go to <a href="http://www.hrsa.gov/bioterrorism.htm">www.hrsa.gov/bioterrorism.htm</a>
	American Hospital Association has regional facility data. For more information go to <a href="http://www.hospitalconnect.com">www.hospitalconnect.com</a>
Bed data	The National Disaster Medical System (NDMS) currently gathers available bed counts on a monthly basis. For more information contact your local NDMS office or visit <a href="http://www.ndms.dhhs.gov">www.ndms.dhhs.gov</a> .
Staffing data	State licensing boards for physicians, nurses, and emergency medical technicians. The American Medical Association also provides a database of health care personnel. For more information go to <a href="http://www.ama-assn.org">www.ama-assn.org</a>



can use in their own surge capacity planning. These tools include a template that identifies staffing and supply needs for a 50-bed acute care unit. With these guidelines from the RMBT project, such a unit could be mobilized quickly. In addition, RMBT is developing a medical armory supply list that will be useful to other regions. This list will describe non-perishable supplies such as beds and intravenous poles that can be stored now and transported when a disaster occurs.

RMBT is also preparing criteria to help communities identify alternate care sites such as hotels and gymnasiums to treat patients in case hospitals are inundated with victims. “We only have so many brick-and-mortar hospitals,” said Stephen Cantrill. “In a true bioterrorism event, they would most likely be filled up and health officials would need criteria to identify other care sites.”

## Challenges in Rural Areas

Many rural hospitals have disaster plans to manage natural catastrophes such as floods, earthquakes, and hurricanes, but few develop strategies that take into consideration an attack involving biological agents. While the threat of a terrorist attack occurring in rural America may seem remote, many of these areas are home to power plants, hydroelectric dams, military bases, and other potential terrorist targets.

Hospitals in rural areas are typically small and resource-strapped, and thus are likely to find it difficult to address surge capacity needs. “Staffing issues

are much more pronounced in rural areas,” said Dr. Cantrill. “Rural hospital closings have exacerbated the situation.” Rural communities rely on volunteer emergency responders, many of whom serve in multiple roles. Primary care is delivered by community health centers and isolated practitioners who lack disaster training. Insufficient emergency equipment and communication systems pose additional problems.

Despite these challenges, rural areas must undertake many of the same emergency preparedness activities as more populated regions. Readiness assessments funded by HRSA in 2002 were the first step in these activities. HRSA’s Bioterrorism Hospital Preparedness Program will enable many rural areas to improve their capacity to respond to bioterrorism and other public health emergencies. In addition, rural hospitals that belong to the American Hospital Association can find resources, including a Rural Hospital Disaster Readiness report, at [www.hospitalconnect.com](http://www.hospitalconnect.com). Rural providers also need to actively participate in disaster drills in order to detect deficiencies in regional planning. Distance learning will be an important means of offering disaster training to rural emergency responders and primary care providers.

## Best Practices in Regional Response

Hospital planners and public health officials—whether urban or rural—can learn from responses to past disasters. The Stanford–UCSF Evidence-based Practice Center is preparing a report that synthesizes the

evidence about efforts to coordinate emergency response services within regions. The report examines regional responses to public health emergencies such as the anthrax cases and the Severe Acute Respiratory Syndrome outbreak. Because there are few terrorist incidents to draw from, the report also includes the evidence about regionalized responses to natural disasters such as hurricanes and earthquakes.

The Evidence Report will document the key tasks that were required to mount a response to each of these events. The report will also catalogue the relevant resources, such as personnel and supplies, needed to perform each task. When the report is completed, public health officials and emergency management professionals will be able to review best practices for performing key emergency response tasks such as surveillance. They will also be able to use it to identify other response organizations in their regions. The report will be available from AHRQ by early 2004 ([www.ahrq.gov](http://www.ahrq.gov)).

Dena Bravata, Project Director at the Evidence-based Practice Center, said the report will draw lessons from the established logistics practices of companies such as Hewlett Packard, Walmart, and Eastman-Kodak. “These companies have implemented cost-effective supply chains for the manufacture and distribution of goods and services to retailers and eventually to customers,” she said. “The challenge of acquiring, storing, distributing, and dispensing antibiotics, vaccines, and other essential materials for a bioterrorism



response is similar.” Programs such as the Strategic National Stockpile and the Laboratory Response Network also offer lessons in regional supply and resource management.

### **For More Information**

The audioconference on which this issue brief is based, “Surge Capacity

Assessments and Regionalization Issues,” is available as a streaming presentation with text captioning on the AHRQ Web site ([www.ahrq.gov/bioterbr.htm](http://www.ahrq.gov/bioterbr.htm)).

Information on the tools discussed in this issue brief, and other tools and publications related to health system preparedness for bioterrorism, will be

posted on the AHRQ Web site as it becomes available. Please check the Web site frequently.

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**The Laboratory Response Network** is an informal partnership that organizes laboratory resources in the event of a bioterrorism attack or public health emergency involving chemicals. The network classifies laboratories from Level A facilities that do routine clinical testing to Level D labs that have containment equipment and expertise to respond to the most dangerous pathogens such as smallpox. Level D labs include only Centers for Disease Control and Prevention and Department of Defense labs, FBI labs, and the U.S. Army Medical Research Institute of Infectious Diseases.

**The Strategic National Stockpile (SNS) (formerly known as the National Pharmaceutical Stockpile)** ensures the availability of life-saving pharmaceuticals, vaccines, antidotes, and other medical supplies and equipment necessary to counter the effects of nerve agents, biological pathogens, and chemical agents. The SNS augments State and local supplies of pharmaceuticals, vaccines, and medical supplies during responses to emergencies. These packages are stored in strategic locations across the country to ensure rapid delivery to the local dispensing sites. State and local officials across the country are developing and testing plans to rapidly dispense the supplies from the SNS to their populations.



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