
Hospital Emergency Preparedness Assessment: A Framework for Integrated Bioterrorism Planning and Response

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Summary

Hospitals and health care institutions are essential elements in preparedness planning for public health emergencies such as bioterrorism. An accurate and efficient assessment of their preparedness and response needs, as well as a coordinated system to address gaps identified through such assessments, is a fundamental ingredient to assuring an effective emergency response. This paper describes an integrated process that facilitates hospital and health care institutional preparedness assessment and capacity building. This process ensures a consistent and coordinated planning and response functions with state and local public health systems.

1. The Context of Assessments in Hospital Emergency Preparedness

Health care institutions recently became the focus of unprecedented attention as the United States in October 2001 faced the first domestic incidents of bioterrorism in 17 years¹. In the wake of the U.S. anthrax attacks of 2001, two broad realizations gained ground. First, substantially more resources needed to be invested in state and local public health systems across the nation in order to raise their capacity to effectively address bioterrorism and other emerging threats. Second, there needed to be a simultaneous investment in preparing hospitals and healthcare agencies to establish similar institutional capabilities, and to become an effective and integrated partner with local public health systems and the first response community. Woven through these realizations was an increasing sense that, in some way, increased

attention toward meeting bioterrorism preparedness needs should also serve to increase the capacity of hospitals, clinicians, public health agencies and first-responders to better address other threats and emergencies, existing and emerging. How could this be done?

Fortunately, work on furthering hospital preparedness for bioterrorism and other high-consequence events had been underway well before the anthrax attacks. In August of 2001, for example, the American Hospital Association released a report from an invitational meeting on hospital preparedness for mass casualties (including bioterrorism) held earlier that year². That report contained over 70 recommendations concerning perceived vulnerabilities, burdens, and constraints facing hospitals as they attempted to enhance their capacity to address emerging threats. Related efforts by the Joint Commission on Accreditation of Health Care Organizations (JCAHO), also begun before the anthrax attacks, culminated in revisions to existing hospital emergency management standards³. One critical enhancement to these standards calls for hospitals to integrate their preparedness planning and response activities with external community response agencies, including local public health departments.

The concept of integrating bioterrorism preparedness and response activities was taken up by Congress early in 2002 when, through supplemental appropriations of over \$1 billion to the Department of Health and Human Services (DHHS), three parallel initiatives were created to elevate and coordinate preparedness planning and response capacities at the state and local

¹ Torok, TJ, et al. "A Large Community Outbreak of Salmonellosis Caused by Intentional Contamination of Restaurant Salad Bars," *Journal of the American Medical Association*, 278(5):389-395, 1997.

² American Hospital Association. Hospital preparedness for mass casualties – Final report. August 2000. Chicago, IL.

³ Emergency Management Standards EC.1.4 and EC.2.9.1. Joint Commission on Accreditation of Healthcare Organizations. January 1, 2002.. Chicago, IL.

level. As a result, in April 2002, the Centers for Disease Control and Prevention (CDC) released funds to each state and U.S. Territory to address 6 categorical areas of preparedness activity. Concurrently, DHHS's Office of Emergency Preparedness released additional funds to increase to 145 the number of Metropolitan Medical Response Systems -- coordinated local programs designed to increase the capacity to respond to incidents involving weapons of mass destruction occurring in the nation's most populated cities. Finally, the Health Resources and Services Administration (HRSA) launched a major new initiative to upgrade specific capabilities of U.S. hospitals to respond to bioterrorism⁴.

With the unprecedented opportunities created by these three federal initiatives, there are also exceptional challenges. Although each has areas of specific focus, there is enough commonality in purpose and approach to force hospitals and state and local response agencies to address significant coordination and integration issues. Hospitals especially face a range of new capacities that must be developed or enhanced. For example, the HRSA guidance addresses 16 substantive elements in the needs assessment process alone. For many capacities needing development, there is a substantial lack of scientific guidance on proven approaches or preferred methods. Finally, hospitals -- already concerned with increasing burdens of uncompensated care, staff shortages, and emergency department overcrowding⁵ -- increasingly confront technology issues as they search for ways to fulfill their preparedness responsibilities while minimizing costs.

2. The Content of Assessments in Hospital Emergency Preparedness

Preparing for bioterrorism adds much that is new to the emergency planning agenda of hospitals and health care institutions. HRSA has specified five "core assessment" elements in its funding guidance to states:

1. Epidemiologic planning
2. Medications and vaccines

3. Personal protective equipment and vaccination
4. Communications
5. Drills

Within these elements are a number of essential preparedness capacities that require close collaboration with public health officials and other external emergency response agencies during an assessment process (see Table 1, below).

⁴ Bioterrorism Hospital Preparedness Program -- Cooperative Agreement Guidance. U.S. DHHS, Health Resources and Services Administration. February 15, 2002; Washington, D.C.

⁵ Derlet RW. Overcrowding in Emergency Departments: increased demand and decreased capacity. *Ann Emerg. Med.* April 2002;39:430-432.

Table 1 Hospital Preparedness Planning Capacities in Common with Local Agencies

Hospital Preparedness Capacity*	Assessment Issues In Common With Other Response Agencies			
	Public Health	Fire/EMS	Police	Medical Examiner
Recognition of a bioterrorist-related condition	✓	✓	✓ (Threat or device)	✓
Potential epidemic involving at least 500 patients	✓	✓	✓	✓
Critical partner relationships	✓	✓	✓	✓
Personnel and care provider notification	✓			
Increase bed capacity to accommodate at least 500 patients	✓	✓		✓
Isolation and quarantine for casualties	✓	✓	✓	✓
Hospital diversion and rapid communication with EMS	✓	✓	✓	
Special needs of children, pregnant women, the elderly and those with disabilities	✓	✓		
Provision for increases in staffing	✓	✓		
Facility evacuation and patient transfer	✓	✓	✓	✓
Alternate site designation	✓	✓	✓	✓
Communication (internal/external)	✓	✓	✓	✓
Backup utilities		✓	✓	
Receipt of the National Pharmaceutical Stockpile	✓			
Media response	✓	✓	✓	✓
Triage of the ill and worried well	✓	✓		✓
Laboratory capacity and referral	✓			
Hospital security	✓		✓	
Protection of staff and their families	✓	✓	✓	✓

* [Note: Table indicates likely interactions among selected local response agencies. While most hospital capacities listed are typically in place to varying extents, an event involving the deliberate use of biologic organisms capable of producing communicable disease requires substantive and significant modifications and additions to existing capacities. Capacity list adapted from: *Bioterrorism Hospital Preparedness Program – Cooperative Agreement Guidance*. U.S. DHHS, Health Resources and Services Administration. February 15, 2002; Washington, D.C.]

Many hospitals and local response agencies have encountered a number of existing surveys and assessment instruments (see examples in Table

2, below). It is very uncommon to find these types of assessments that integrate hospital and healthcare institutional capacity measures with

those of other community emergency response agencies. The focus for hospitals has been to assess only their institutional capabilities (e.g. staff and bed surge capacity, supply inventories, internal phone-trees and other communications aids, etc.). It is now a requirement to assess their roles and responsibilities in relation to those of external agencies (such as epidemiologic and law enforcement tracking of cases, routing of patients, interactions with the media, etc.).

Table 2 Assessment Instruments

Assessment Instrument	Integrates Hospitals & Other Agencies?
DOJ Assessment Survey	Yes
JCAHO Emergency Management Standards and checklists ⁶	No
State-designed instruments ⁷	Some
American Hospital Association Bioterrorism Preparedness Checklist	No
Local Emergency Preparedness and Response Inventory ⁸	Yes
Association of Professionals in Infection Control and Epidemiology (APIC) Hospital BI Planning Template	No

To ensure that local emergency response *system* capacities are collectively and effectively assessed, the content and deployment of assessment instruments needs to be coordinated among many partnering response agencies. Such collaboration should result in an assessment instrument that achieves three ends:

- Measures institutional capacities unique to the organization’s operating environment
- Measures institutional capacity to exchange information and coordinate duties with other emergency response agencies
- Captures critical information on various assets, procedures, and personnel useful for later planning purposes and during an emergency event

⁶ *Perspectives*. Joint Commission on Accreditation of Healthcare Organizations, December 2001;21:12

⁷ See for example, “Comprehensive Assessment of Bioterrorism Preparedness in Texas Hospitals,” Texas Department of Health. June 17, 2002.; Hospital Bioterrorism Preparedness and Readiness Planning Questionnaire. Illinois Department of Public Health. February, 2002.

⁸ Local Emergency Preparedness and Response Inventory. Centers for Disease Control and Prevention. March, 2002.

3. A Framework for Hospital Emergency Preparedness Assessment

An integrative approach to assessing existing preparedness capacity for events such as bioterrorism offers several advantages. First, the inclusion of both hospital and other local response agencies assures measurement of the capacity for interaction among agencies with responsibilities that require either shared information or coordination. An integrated approach also fully promotes representative participation in ongoing preparedness planning and evaluation activities. Third, for those capacities that are duplicated across several institutions, integrated assessments help standardize their description and measurement. Finally, an integrative approach offers the opportunity to automate the assessment process, creating a community wide knowledge base that can be captured within an information technology foundation for both preparedness planning and emergency management.

Since there is wide variation in the degree to which communities or regions have advanced their preparedness efforts, a modular approach that supports an integrated assessment is recommended. Figure 1, illustrates this suggested approach.

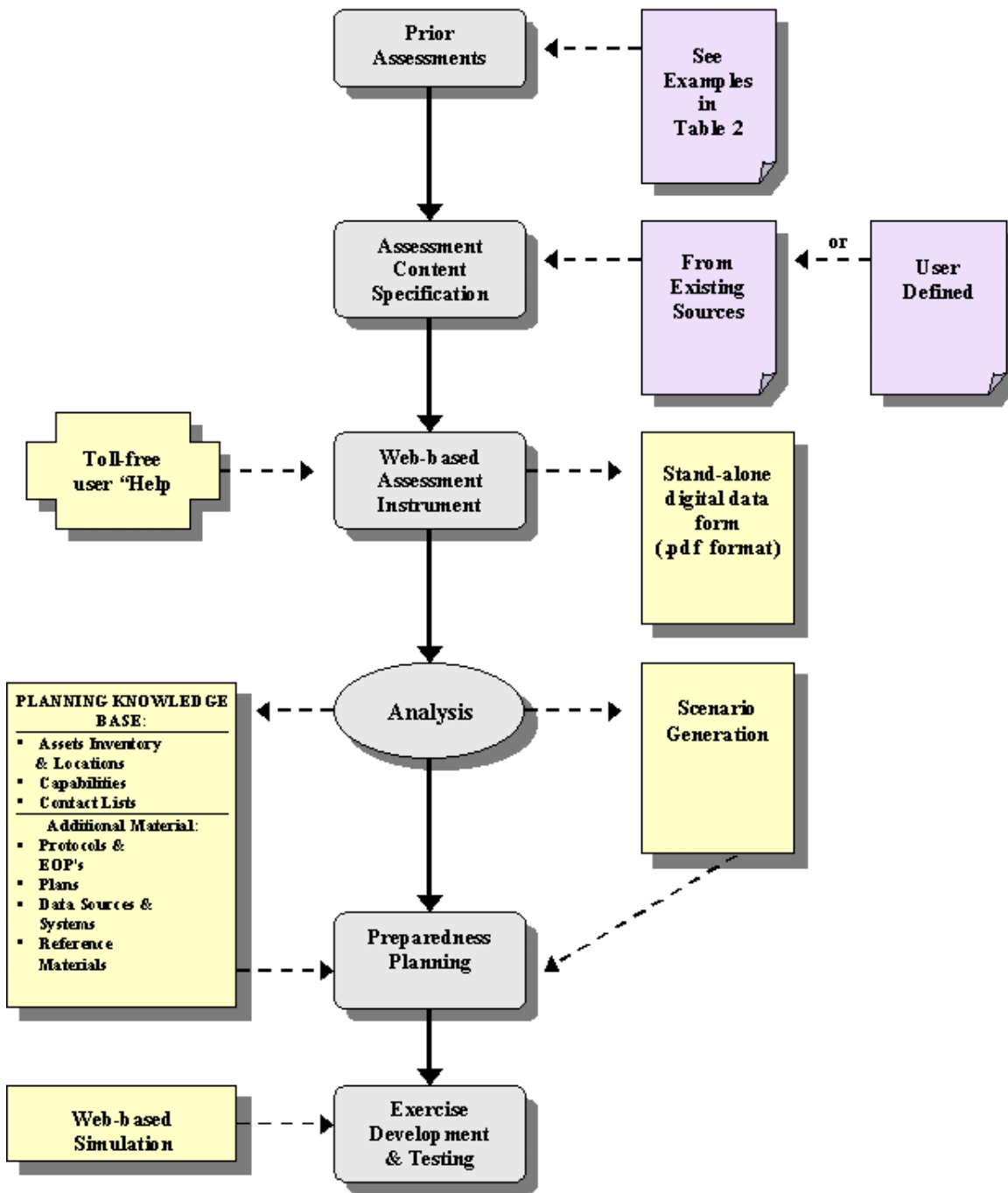


Figure 1 Integrated Assessment Framework for Hospitals and Local Response Agencies

The Framework may be initiated through interagency planning meetings or, if a coordinated collaborative preparedness planning process does not yet exist, the formation of a cross-agency group for this purpose. Introductory bioterrorism “Tabletop” planning exercises are a good way to begin this process. The Framework accounts for prior assessments, both institutional and system-wide. These are important not merely for the data obtained but also as indicators of the effectiveness of prior assessment processes.

The second Framework module focuses on identifying the assessment content. The assessment may be populated with measures derived from existing instruments, from user-specified requirements, or a combination of both. A critical element in this phase is the standardization of content (such as among several hospitals) and the inclusion of measures that capture shared *system* capacities and those requiring coordination among multiple emergency response agencies. This is achieved using a structured elicitation of agency roles and responsibilities, identifying shared or overlapping functions, and creating assessment content that captures corresponding preparedness capacities fully and consistently.

The central feature of the Framework is the engineering and deployment of a web-based Preparedness Assessment instrument. Users access an automated interactive data collection site that guides them through the process of compiling and transmitting responses. This approach increases response consistency, completion speed, and user compliance, while expediting the later analysis of submitted information. The Framework can optionally employ interactive, stand-alone electronic data forms for field capture of various data elements, or as an alternative when web access is precluded. A toll-free user “Help-Line” can also be established during the assessment period, answering user questions and centralizing the collection and reporting of issues that may arise during the assessment process.

The fourth Framework module, “Analysis and Reporting,” evaluates the assessment data and generates and distributes a series of user-defined reports. These serve as a “baseline” for subsequent “gap analyses” in which existing

capacities are compared with necessary capacities. The analysis also feeds future preparedness planning efforts, as well as two associated activities: a “Planning Knowledgebase” and a “Scenario Generation” process.

A critical objective of the Framework’s “Preparedness Planning” module is the creation or modification of a local or regional bioterrorism response plan. Results from the assessment process help planners and response agency personnel structure and organize a regional emergency response, reach consensus on institutional roles and responsibilities, and lay a foundation for future drills and exercises to test the sufficiency of developed capacities. Results from the assessment process also form an essential ingredient of a “Planning Knowledgebase.” Information collected through the assessment, such as personnel contacts, supply locations and inventories, and communications protocols, can be integrated into a digital repository. Additional supplemental information – response protocols, disease surveillance information, pre-scripted public information for citizens and the media – forms the basis for a centralized emergency event decision and management information tool.

The sixth Framework module, “Exercise Development and Testing,” provides a mechanism by which hospitals, as single entities or as part of the broader community response system, can evaluate the sufficiency of plans and procedures based on information obtained through the assessment process. Efforts to test hospital and system readiness need to occur frequently – complex response issues, such as those associated with an outbreak of smallpox, need to be examined often and in detail. Turnover among staff, elected officials, and agency leadership adds to this need. Finally, any effective training and education of health care workers and response personnel from other agencies depends on testing their competency to function according to an established plan. These factors make it difficult for hospitals and other response agencies to organize drills and exercises with the frequency and level of detail that is often required. Recognizing these limitations, the Framework accommodates development of web-based simulations of

elements of the Preparedness Plan as an adjunct to full-scale, community-based exercises.

Conclusion

Health care providers increasingly are becoming aware of the complexities and demands involved in preparing for circumstances once thought extremely unlikely. An opportunity is at hand, however, to channel efforts so that the capacities developed to meet low-probability, high-consequence events such as bioterrorism can also elevate day-to-day healthcare operations and services. Understanding how to accomplish this, as well as identifying what capacities need development or enhancement, depends on a structured approach to needs assessment. Integrating and automating hospital and other response agency preparedness assessment activities assures that necessary capacities are identified and that coordinated response *systems* are developed. The modular Framework described above ensures a consistent, efficient, and collaborative approach.

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