

Hospital Response to Public Health Emergencies: Collaborative Strategies



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The HRET project team dedicates this report to the memory of Dr. Reed Grier, a critical member of our team, who passed away suddenly in August, 2005. Reed worked tirelessly to collect and analyze the data for this study and used the data for his own doctoral work at the University of California, Berkeley. Reed's thoughtful insights and contributions throughout this project were invaluable. All of us at HRET miss him as both a colleague and friend.

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B A C K G R O U N D

Hospitals recognize that an adequate medical response to mass casualty disasters, sudden epidemics, and other public health emergencies is beyond the capacity of individual organizations. Public health agencies, hospital trade associations, and the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) are calling for collaborative community interorganizational preparedness planning and response programs.¹ However, the vast array of public agencies and private organizations with which hospitals plan and respond to public health emergencies is highly fragmented and lacks integration.

This HRET report summarizes findings from eight case studies developed from 2003 to 2004 to understand how hospitals work with public health partners to

jointly prepare for public health emergencies. HRET investigated interorganizational preparedness planning and response approaches by interviewing key informants in eight communities within six states.² Research outcomes include identification of collaborative planning models that hospitals, public health agencies, and emergency medical services (EMS) use to jointly plan, prepare for, and respond to public health emergencies. The lessons learned from the study are adaptable to regional emergency response planning coalitions. This study is designed to be a descriptive, rather than an evaluative, exercise. Case study sites are purposively selected states and communities. For the most part, approaches implemented by the eight case sites were still in development at the time of this investigation and had not been tested or evaluated.

¹ American Hospital Association Final Report, "Hospital Preparedness for Mass Casualties." August 2000. <http://www.aha.org/aha/content/2000/pdf/2000forumreport.pdf>; JCAHO Guide, "Strategies for Creating and Sustaining Community-wide Emergency Preparedness Systems." March 2003. http://www.jointcommission.org/PublicPolicy/Emergency_Preparedness.htm.

² The eight case study sites include: Orange County, CA; Portland, OR; Corvallis, OR; Rockford, IL; St. Louis, MO; Shreveport, LA; Palm Beach County, FL; and Miami-Dade, FL.

P U R P O S E

The purpose of the study is to assess how hospitals work with public health agencies and EMS to develop community-level surge capacity and improve medical preparedness for mass casualty events, epidemics, and public health

emergencies. More specifically, the study identifies methods and practices hospitals employ to accomplish collaboration and coordination in emergency response planning and implementation.

M E T H O D S

This study encompasses a document review and forty interviews with key informants representing hospital, public health, and EMS organizations at the state and community levels. Eight communities in six states were purposively selected for their regional diversity and their distinct approaches to preparedness planning. HRET conducted interviews between January and August 2004 with the twin objectives of identifying

collaborative strategies for preparedness planning and response, and examining hospitals' role in state and local public health-led preparedness planning. Surge capacity is an essential subcategory of interest. More details on HRET's methodological approach can be found on our website, www.hret.org/preparedness. State and community case study summaries are also posted on the website at www.hret.org/preparedness.



P L A N N I N G F O R S U R G E C A P A C I T Y

Surge capacity has been defined as a health care system's ability to expand quickly beyond normal services to meet an increased demand for medical care in the event of bioterrorism or other large-scale public health emergencies.³ Surge capacity requires having adequate facilities, clinical staff and other personnel, pharmaceuticals, equipment, and supplies to treat an influx of patients of varying numbers, depending on the nature of a particular emergency. These resources must be readily available.

To date, the federal government has devoted considerable financial and administrative resources to aid states and localities in emergency preparedness planning. The National Bioterrorism Hospital Preparedness Program, created in 2002 in response to the events of September 11, 2001, identifies regional surge capacity as a priority. Guidelines and benchmarks developed by the Health Resources and Services Administration (HRSA), which administers the National Bioterrorism Hospital Preparedness Program, assist regional and local emergency preparedness planners in identifying the essential levels of facility, equipment, pharmaceutical, and human resources. For example, HRSA's Regional Hospital Plan for Optimizing Surge Capacity requires state health departments to plan for a potential epidemic involving at least 500 acutely ill patients per million population in each region. The table HRSA Surge Capacity Benchmarks contains all the regional surge capacity critical benchmarks HRSA

uses to measure preparedness. In addition to identifying what resources are needed to meet surge capacity, planners must address how hospitals will share resources and responsibility in the event of an emergency.

Regional surge capacity benchmarks establish minimum standards for hospital bed capacity, isolation capacity, health care personnel, pharmaceutical caches, personal protective equipment, decontamination, behavioral health, trauma and burn care, and communications and information technology. These standards set criteria for equipment, personnel, and facilities; however, they do not measure or describe collaborative strategies for achieving these benchmarks. This report provides insights on how to effectively collaborate in preparing for and responding to major public health emergencies. Facilitating the coordination and delivery of resources at the local and regional levels is essential to creating adequate surge capacity and, more broadly, a workable and comprehensive emergency preparedness plan. Since completion of the HRET study, Hurricane Katrina has illuminated major governmental failings and shortcomings in emergency response and mitigation at the federal, state, and local levels. This study has produced many examples of collaborative strategies that can be used in disaster planning and preparedness at the local and regional levels by hospitals, EMS, public health agencies, government agencies, and social service organizations.

³ Agency for Healthcare Research and Quality Bioterrorism and Health System Preparedness Issue Brief No. 8, Surge Capacity: Facilities and Equipment Oct 2005 www.ahrq.gov/news/ulp/btbriefs/btbrief8.htm.

Table
HRSA Surge Capacity Benchmarks

CRITICAL BENCHMARK	CATEGORY	DESCRIPTION
#2-1	Hospital Bed Capacity	<p>Ability to treat 500 adult and pediatric patients per 1 million population with acute illness or trauma</p> <p>Staff and equip sufficient hospital beds to manage a surge of 500 acutely ill adult and pediatric patients per 1 million population</p>
#2-2	Isolation Capacity	<p>Provide one negative pressure HEPA filtering isolation facility per surge hospital with ability to support evaluation and treatment of 10 adult and pediatric patients at a time</p>
#2-3	Health Care Personnel	<p>Ability to immediately deploy 250 additional patient care personnel per 1 million population in urban areas and 125 or more additional personnel per 1 million population in rural areas</p>
#2-5	Pharmaceuticals	<p>Provide pertinent pharmaceuticals in response to bioterrorism or other public health emergencies</p>
#2-6	Personal Protective Equipment	<p>Provide personal protective equipment for 250 or more health care personnel per 1 million population in urban areas, and 125 or more health care personnel per 1 million population in rural areas</p>
#2-7	Decontamination	<p>Provide portable or fixed decontamination systems for 500 patients and workers per 1 million population</p>
#2-8	Mental Health	<p>Provide a graded range of acute psychosocial interventions and longer-term mental health services to 5000 adult and pediatric clients and health care workers per 1 million population</p>
#2-9	Trauma/Burn Care Capacity	<p>Provide trauma care to at least 50 severely injured adult and pediatric patients per 1 million population per day</p>
#2-10	Communications and IT	<p>Ensure connectivity between public health, hospitals, EMS, and other relevant agencies during a terrorist incident or public health emergency with secure and redundant communications systems</p>
#3	EMS	<p>Mutual aid plan for upgrading and deploying EMS units in jurisdictions not normally covered in response to a mass casualty incident</p> <p>Ability to provide EMS coverage for at least 500 adult and pediatric patients per 1 million population per day</p>

F I N D I N G S

Hospitals are collaborating with public health agencies, EMS, and other community partners to prepare for natural disasters, bioterrorism, and public health emergencies in numerous ways. They are improving organizational capacity; participating in intersectoral and interorganizational state, regional, and metropolitan emergency-planning committees; developing interoperable plans, policies, and procedures; and conducting emergency drills with community health and EMS partners. The findings of this report describe how hospitals have engaged in public health–led preparedness planning processes, with an emphasis on the strategies employed to address challenges in collaborative planning. Examples are provided of the various ways surge capacity is being developed in the case study sites.

Creating Interorganizational Surge Capacity Plans

Statewide Surge Capacity Planning

Planning statewide surge capacity can be highly centralized, decentralized, or mixed; moreover, it can be government led, government guided, or privately led.⁴ There is much variation among states with respect to how they have developed statewide plans for surge capacity. Some states, such as Illinois and California, have implemented a top–down approach, in which a state agency creates a plan to be implemented in all regions of the state. In these states, a master mutual aid agreement provides the backbone for the plan. Others, such as Florida and Louisiana, have embraced a

decentralized approach in which the statewide emergency hospital response plan comprises a patchwork of regional plans. In Florida and Louisiana, the state hospital associations are working with all designated regions to develop region-specific plans.

In comparing decentralized to centralized state preparedness planning, one key informant—a proponent of the decentralized approach—makes a compelling argument:

While coordinated state preparedness planning is important, the immediate context for emergency medical response is the metropolitan area or rural region. Programs and funding for integrated hospital, EMS, and public health emergency planning processes and response plan development are essential. The metropolitan area or rural region is the appropriate geographic unit for immediate response planning; larger regional areas and state planning should support this immediate local response.

On the other hand, states with a centralized uniform approach may be better prepared to respond to mass casualty events. As of 2003, Florida, Louisiana, and Oregon did not have statewide surge capacity plans or emergency management systems to fully integrate hospital and governmental medical planning and response throughout the state. For illustrations of

⁴ Descriptions of state-level organizational approaches to medical emergency planning reflect the opinions of hospital, public health, and EMS key informants as of 2004. Some of the states featured in this study may have implemented new organizational approaches since the background and case study interviews

centralized and decentralized statewide surge capacity planning, see the sidebar, Going Statewide.

Demand for Auxiliary Health Care Personnel

Conduits to auxiliary medical and health care personnel are being created to build an interoperable shared system in a resource-limited environment. In general, there is pervasive reliance on the use of federal disaster medical assistance teams (DMATs)⁵ to provide additional staffing in an emergency event. While DMATs are assembled locally, it is the federal government that directs them to respond to an emergency. Consequently, some states have adopted their own versions of the DMAT. For example, the Illinois Medical Emergency Response Team (IMERT) is activated during a state-declared disaster to relieve local hospital responders so they can return to their institutions of care. Additionally, the Illinois Nurse Volunteer Emergency Needs Team (INVENT) trains nurse volunteers who hold unrestricted licenses (but who do not have a background in emergency medicine) to respond to mass casualty emergencies.

Resource-Sharing Agreements

Health care resource-sharing arrangements are utilized by a broad range of governmental and nongovernmental entities to facilitate mass emergency response. Resource sharing at the regional and local levels between community partners typically concerns health care staff and pharmaceuticals; however, the scope and sophistication of sharing arrangements differ across planning sites. Agreements vary depending on the type of governmental units and institutions involved. At the state level, mutual aid agreements or memorandums of

Going Statewide

Historically, the Illinois Department of Public Health (IDPH) has borne responsibility for the development of a statewide hospital surge capacity plan. The Illinois State Emergency Disaster Plan was created in the early 1990s in response to an earthquake prediction for the New Madrid Fault in Southern Illinois. Today, the Illinois Department of Public Health administers the state's hospital preparedness and disaster planning program (excluding the City of Chicago, which receives its own funding for hospital preparedness). IDPH coordinates and monitors the development of core preparedness standards, collaboration and communication between regions, and consistency and interoperability of plan implementation across the state. Illinois enacted a mutual aid and assistance pact linking health departments and city and county governments throughout the state after this study was completed.

In California, the Emergency Medical Services (EMS) Authority is responsible for statewide disaster medical response. The EMS Authority maintains a State Disaster Medical Plan. All hospitals participate in the California disaster response system by signing a master mutual aid agreement that is administered through the state's Standardized Emergency Management System. Local EMS and regional hospital associations lead county and regional preparedness planning in California. The local EMS agency is responsible for direction, coordination, oversight, management, and evaluation of EMS and hospital preparedness planning. Local EMS agencies have day-to-day working relationships with hospital emergency departments. In Orange County, a disaster coordinator and four full-time staff work closely with hospitals, attend hospital disaster planning meetings, and help design county exercises. For example, staff assisted individual hospitals in developing smallpox plans based on a county template. The Orange County sheriff is head of emergency management during a disaster, but in the event of a health disaster, he shares joint command with the county health officer, who makes decisions on the health aspects of the emergency event.

Continued on page 10

⁵ A DMAT is a group of professional and paraprofessional medical personnel (supported by a cadre of logistical and administrative staff) designed to provide medical care during a disaster or other event. Each team has a sponsoring organization, such as a major medical center, a public health or safety agency, or a nonprofit, public or private organization that signs a memorandum of agreement (MOA) with the Department of Homeland Security. The DMAT sponsor organizes the team, recruits its members, arranges its training, and coordinates its dispatch.

Going Statewide *Continued from page 9*

In Florida, regional hospital response plans are based on law enforcement regions. These do not correspond to actual hospital regional markets. The Florida medical emergency preparedness program is located in the Office of Public Health Preparedness, Division of Emergency Medical Operations, Department of Health. The Florida Comprehensive Emergency Management Plan, produced and overseen by the Department of Law Enforcement, governs all relevant state agencies and their preparedness activities, including the Department of Health's medical emergency program. As of 2004, Florida did not have a statewide hospital response plan.

Oregon has applied a combined approach in which the state has provided regional advisory boards with tools and templates to guide the regional planning process. The Public Health Emergency Preparedness Program in Oregon's Department of Health Services, Public Health Division, is developing a statewide trauma system. Oregon has no master mutual aid or single emergency management system. Regionally, Area Trauma Advisory Boards, consisting of hospital-based health care workers, are working with area hospitals to collaboratively develop regional bioterrorism and infectious disease response plans using a state template. For the past 10 to 15 years, Portland's Hospital Emergency Planning Committee has fostered networking among hospitals and supported individual hospital and health system preparedness activities. While there is a solid network of operational relationships between hospitals and governmental response agencies, no formalized plan for in-patient capacity had been developed in Oregon at the time of this study.

Missouri has developed a very effective mixed approach. The Missouri Hospital Association actively coordinates planning activities with the state health department's Center for Emergency Response and Terrorism (CERT), hospitals, and local emergency response agencies. For more detailed information, please refer to the Missouri case study posted online at www.hret.org/preparedness.

understanding are entered into by the state's emergency response agency and local governments to facilitate resource allocation and coordination in the event of an emergency. Factors dictating the scope and terms of resource sharing agreements include:

- Type of community served
- Type of hospital
- State of existing health/emergency response infrastructure
- History of emergency response and collaboration
- Competitiveness of the local health care market

Sharing agreements that are not mutually exclusive give rise to performance problems. Due to the independent and overlapping nature of negotiating and implementing sharing agreements, uncertainties exist with respect to the level of double counting that occurs. The number of partners relying on the same finite supply of physical resources and personnel may not be known. When an emergency arises, multiple hospitals and other health care and public health entities may seek access to a mutual source of supplies, only to discover that available reserves are insufficient to satisfy all partner organizations.

Credentialing Volunteers

Multiple legal issues and concerns have proven to be formidable barriers to the use of volunteer health professionals during public health disasters. These include verification of licensing, approval of out-of-state licensing, liability issues, workmen's compensation coverage, and other compensation concerns. During the events of September 11, hospitals in lower Manhattan were unable to use volunteer health professionals because medical and other credentials could not be verified due to disruptions in standard telecommunications.⁶ Some states have already

⁶ U.S. Department of Health and Human Services, Health Resources and Services Administration, Emergency System for Advance Registration of Volunteer Health Professionals, accessed online on August 1, 2006, at www.hrsa.gov/esarvhp/legregissues/default.htm.

established volunteer credential databases to facilitate quick activation of volunteer licensed professionals, including physicians and nurses, yet the federal government has recognized that more needs to be done.

Pursuant to the Public Health Security and Bioterrorism Preparedness and Response Act of 2002, HRSA is promulgating guidelines and model state legislation that will create an Emergency System for Advance Registration of Volunteer Health Professionals, commonly known as ESAR-VHP. Each state will include verifiable and up-to-date information regarding the volunteer's identity and licensing, credentialing, accreditation, and privileging in hospitals or other medical facilities. Standardization of state systems for preregistering volunteers will expedite the use of volunteer health professionals in emergencies and disasters, and will facilitate multistate and federal collaboration.

Funding/Resource Reimbursement

In addition to resource allocation, mutual aid agreements also provide for reimbursement of costs incurred by provider organizations. In California, the EMS Authority maintains a State Disaster Medical Plan as part of the ongoing planning and development of the Standardized Emergency Management System (SEMS), the emergency response, mutual aid, and resource reimbursement system used throughout the state. Local jurisdictions participate through the state's master mutual aid agreement. Absent provisions for reimbursement of expenses contained in mutual aid agreements and other contractual arrangements, hospitals, agencies, and organizations are unlikely to provide or maintain assistance to areas affected by mass casualty disasters.

Planning Costs

Most surge capacity funding is targeted for purchasing necessary assets and supplies; however, budgets and appropriations for emergency preparedness must also

cover planning activities, participation costs, and table-top and large-scale exercises; otherwise, disaster response will be disorganized and inadequate. Participation costs associated with preparedness planning and emergency response drills exacerbate the chronic underfunding and understaffing of public health, hospitals, and EMS in the United States. Emergency preparedness planning activities are expensive and time-consuming, and divert staff from other core duties. Key informants from each stakeholder group explain how organizational costs related to staff participation in both planning and exercises include not only the direct time costs of the personnel involved, but also the costs incurred in backfilling critical staff positions. These financial realities must be recognized and addressed so that effective emergency preparedness plans can be developed, tested, and maintained.

Lessons Learned from the Interorganizational Planning Process

Hospitals participate in regional preparedness planning.

States differ in how hospitals participate in regional emergency preparedness planning. Differences in state public health management systems, the use of state hospital associations as emergency preparedness planning subcontractors, and state and community planning models affect hospital participation in regional emergency planning.

As the primary recipients of federal preparedness funds, state health departments are charged with ensuring hospital surge capacity and response planning. While a few states have contracted this work to hospital associations, hospitals and hospital associations typically participate in the planning process through a state's bioterrorism preparedness planning committee.

All the case study states implemented interorganizational bioterrorism preparedness advisory committees as specified by federal law and administered through the Centers for Disease Control and Prevention (CDC) and HRSA cooperative agreements. In these states, the advisory committees have wide representation from multiple health and other sectors important to preparedness planning. These include the state hospital association as well as EMS, state health agencies, public safety, environmental protection, veterinary medicine, agriculture and other state agencies.

Typically, the advisory committees guide statewide hospital surge capacity assessments, response plan development, exercise planning, and distribution of HRSA funds. Advisory committees are generally staffed by state agency employees who prepare technical documents and draft plans. Most committees meet quarterly to review and approve these documents and plans. In some states, working subcommittees staffed by volunteer professionals analyze survey data and develop standardized emergency preparedness plans, policies, and procedures.

State emergency management agencies and mutual aid systems provide the structure for regional hospital preparedness planning programs in California and Illinois. Although hospital associations participate in collaborative statewide intersectoral advisory committees, state agency staffs in California and Illinois are largely responsible for hospital preparedness planning. Under this model, the role of the interorganizational advisory committee is to foster communication between sectors, advise state staff, and review agency work product.

The California EMS Authority exemplifies this approach. EMSA is responsible for statewide disaster medical planning and response in California. It maintains a statewide Disaster Medical Plan as part of the ongoing development of the county-based

Standardized Emergency Management System (SEMS). The state has developed population-based preparedness fund allocations for each county and provides a menu of approved hospital capacity improvements that can be purchased with federal CDC and HRSA preparedness grants. The EMS Authority has several hospital interest-group advisory committees. Regional hospital surge capacity planning is largely county-based, following the requirements of SEMS. Hospital disaster planning at the county level is the responsibility of local EMS which also have hospital advisory committees. The regional hospital associations collaborate with the state to facilitate county-level emergency preparedness hospital planning meetings.

In other states, hospital bioterrorism planning activities, including hospital capacity assessments and development of state and regional plans, are subcontracted to state hospital associations. For example, the Oregon Association of Hospitals and Health Systems developed and administered a baseline hospital capacity and needs assessment survey that the state bioterrorism advisory committee will use to (1) identify emergency planning needs; (2) identify potential improvements to hospital and health care system relationships with local public health departments and public safety agencies, and (3) establish health care regions capable of providing coordinated responses to potential threats.

In Louisiana and Missouri, each state's department of health has used HRSA grants to subcontract the state hospital association to develop hospital emergency response plans and assess surge capacity needs. The Missouri Hospital Association assessed hospital response capacity and developed disaster preparedness response plans for all hospitals in the state. A steering committee consisting of hospital CEOs and consultants reviewed preparedness assessments and response plans prepared by the association. Notably, respondents

reported a high level of consensus during committee discussions, because most participants in this process represented hospitals.

Similarly, the Louisiana Hospital Association developed regional hospital preparedness and response plans and completed hospital preparedness grant deliverables through a memorandum of understanding with the Louisiana Department of Health and Hospitals. In addition, the Louisiana Hospital Association is an integral component of the State Emergency Operations Plan. Together with the state's Department of Health and Hospitals, EMS, the Department of Social Services, and the Nursing Home Association, the hospital association is part of the Health Care Pod and maintains a constant presence at the emergency operations center during a disaster. Its role is to call hospitals for capacity information, coordinate hospital responses, and collaborate with state officials in a declared emergency. Lastly, the Florida Hospital Association is developing regional response plans, which are to be rolled up into an overall state plan.

Interdisciplinary planning tests territorial boundaries.

The public health–led process frequently tests territorial boundaries. A number of respondents noted that stakeholders in their communities questioned “the sense and possible consequences of having organizations unfamiliar with hospital operations overseeing and making decisions on behalf of hospitals.” In addition, undefined roles, unaligned accountabilities, and different worldviews can fuel cross-sectoral tensions and make it difficult for the various participants to “speak the same language” in the planning process.

One respondent felt that EMS and police departments define the preparedness agenda, while another observer complained that “we still have a public health perspective and public health language, yet people in that industry have never worked in emergency

management of hospitals.” A key informant advised that state and local health departments need to understand that hospitals are private enterprises. On the other side of the divide, it was noted that hospitals seemed to have an attitude that “we’ve been doing this for years. You don’t need to tell us how to do it. This is our language, and we don’t understand public health and emergency management roles. ”

Preparedness planning is a zone of collaboration.

Despite existing tensions, most hospital and public health informants support broad, interorganizational preparedness planning and concur that true preparedness requires access to the expertise and resources that reside within discrete sectors. Many respondents acknowledge that prior to the federal preparedness mandate, organizations were not challenged to work together regularly or substantively. In some communities, the mandate was necessary to dismantle barriers to working across organizations. One key informant commented that emergency preparedness planning—much like other health care issues, such as patient safety—highlights the need for team-centered approaches. Another observer marveled that public health–led preparedness planning has been instrumental in getting executives from competing hospitals to meet each other in one room, contrary to the norm.

Neutral third parties help subordinate competition.

In areas where competition is a barrier to meaningful inter-hospital planning, treating preparedness as a “zone of collaboration” and using neutral third parties to coordinate efforts has proven highly effective in getting the right actors to the table and making each organization’s efforts worthwhile.

For example, in Missouri, the state hospital association recommended surge capacity planning be delegated to neutral, regional planning organizations in order to overcome hospital competition in urban areas. As a

result, the St. Louis Metropolitan Medical Response System partnered with the East-West Gateway Council of Governments—a regional planning body of elected officials, executives, and county officers—to coordinate medical response to emergencies. Together they created a new not-for-profit entity, the St. Louis Area Regional Response System (STARRS), to ensure ongoing regional hospital preparedness and response capacity. Its quasi-public designation enables STARRS to receive both government and private grants and contracts to build the level of preparedness and response capacity of all St. Louis-area hospitals.

In Palm Beach County, Florida, local anthrax exposures in the wake of September 11, 2001, stirred a sense of urgency within the highly competitive hospital community. The Palm Beach County Medical Society emerged as a neutral organization with the technical expertise and credibility to work with all of Palm Beach's hospitals. Its separate 501(c)3 organization, the Healthcare Emergency Response Coalition (HERC), is responsible for interorganizational emergency preparedness planning and represents all area hospitals as well as the local health department, the emergency operations center, the fire rescue department, the sheriff's department, and the Red Cross.

HERC received a grant to create a community-wide mass casualty plan. It developed a memorandum of understanding signed by all hospitals in the county to enable transfer of patients, pharmaceuticals, supplies, staff, and equipment between facilities in an emergency. Through this process, interoperable hospital emergency policies and procedures were developed by consensus of the participating institutions. The few contentious issues were resolved by vote. The collaborative process in a neutral environment fostered a mutual understanding of all players' institutional practices, worldviews, and unique constraints.

In many states, the state public health department contracts with the state hospital association to fulfill various planning activities and federal grant deliverables, such as developing regional and statewide surge capacity plans, conducting needs assessments, facilitating regional meetings, and coordinating the distribution of preparedness funds. These tasks are facilitated by the unique ability of the state hospital association to convene and communicate with its membership.

Emergency preparedness is a process, not an outcome.

For many informants, the real value of planning is not the formal plan, policy, and procedural outputs, but the process itself, which provides a forum in which to form interpersonal and interorganizational relationships and to communicate knowledge, skills, and experience. Additionally, the informal networks developed through joint planning ventures and exercises help build trust between individuals and organizations. Informants reported that participants develop mutual understanding and a shared worldview that fosters productive working relationships.

Meetings and drills facilitate communication and coordination.

Reciprocally attended meetings, exercises, and drills facilitate communication and coordination across organizations. In particular, interorganizational, intersectoral mass casualty exercises produce a number of key outcomes.

- They test assumptions underlying organizational and community response plans.
- They train participants with respect to organizational and community response plans.
- They help participants evaluate organizational responses in relation to community-wide response and other organizations' responses.
- They teach participants about individual and organizational roles and emergency decision-making.

In Corvallis, Oregon, the county health department conducted a community tabletop exercise in which stakeholders representing emergency response agencies, police, fire, and hospitals from three counties walked through a scenario to compare organizational response plans and identify conflicts and inconsistencies. This “crosswalk” of organizational response plans in the region identified problem areas for correction, created a shared understanding of system-level response problems, and reinforced working relationships. The most important outcome arising from such drills is the creation of an understanding among participants about the implications of their actions on the larger response system during an emergency. Additionally, critical findings from disaster and exercise experiences can be used proactively to give feedback to planning committees in order to change community response plans, policies, and procedures, and to design new exercises.

Novel strategies create consistent and relevant preparedness efforts across sectors. Ensuring cohesive and consistent planning activities among all players in all sectors is a universal concern for state planning committees—a concern that case study sites addressed with various tactics. Florida, for example, consolidated its public health and health care planning groups, which had separate federal funding sources, into a single preparedness planning committee. A multi-disciplinary Federal Funding Coordination Committee, chaired by the Department of Law Enforcement, was created to ensure consistent statewide standards and provide technical assistance across disciplines and projects.

Other states created distinct hospital-focused forums and advisory committees. The purposes of these kinds of groups range from collecting and disseminating

information relevant to hospitals to helping connect preparedness activities in individual hospitals and health systems with those in the public realm. For example:

- In Illinois, representative hospitals from each of the state’s 11 regions form the Hospital Preparedness Work Group. The group meets quarterly with the Illinois Department of Public Health to ensure statewide consistency in preparedness planning.
- Oregon’s Health Preparedness Advisory Committee represents a broad spectrum of preparedness stakeholders including the state hospital association, the state police, the National Guard, the Red Cross, the state health department, and emergency management officials. A separate Implementation Subcommittee consisting of a broad range of health care membership associations focuses on surge capacity strategies.

Collaborative Planning Models

The development of different planning models across our case study sites demonstrates the impact of federal constraints, local customs, and existing health care and public health infrastructure on the type of response plan adopted. Federal grant requirements, specified in the CDC and HRSA cooperative agreements used by all states and communities to fund emergency preparedness, largely define preparedness planning agendas and participants. Historical working relationships, market conditions, resource availability or scarcity, and local champions spark innovative regional and local approaches to preparedness.

Prior to the federal mandate that various community organizations collaborate to develop preparedness plans, certain communities in this study did have a history of collaboration through either the Metropolitan Medical Response System,⁷ previous state-level disaster experience,⁸

⁷ Miami-Dade County, Florida; Orange County, California; Portland, Oregon; Shreveport, Louisiana; St. Louis Missouri.

⁸ California, Florida, Illinois, Missouri, and Louisiana.

or other outlet.⁹ These historical interactions set the tone and provided a structure for planning and coordinating preparedness activities across organizations. Typically, federal grants have been used to build on and connect existing relationships and infrastructure. In contrast, other communities found numerous barriers to collaboration—such as intense hospital competition—and needed newly enacted federal mandates to compel cooperation.

The study sites developed several types of regional emergency preparedness and response planning models that function within the context of the larger federal system. These models illustrate the effect of local and state context on the type of system each study site adopted.

The Sole Trauma Center Regional Response Planning Model

At the time of this study, Miami-Dade County, Florida lacked both a formal regional surge capacity planning process and an official hospital response plan adopted by all hospitals, health departments, and EMS agencies in the region. Key informants reported that it was anticipated that Jackson Memorial Medical Center, the Miami-Dade County Hospital, will serve as the primary locus of response to any mass casualty event. Affiliated with the University of Miami's School of Medicine, Jackson Memorial is the only Level 1 trauma center in Miami-Dade County. It has been designated by the state as the primary receiving hospital in south Florida for weapons of mass destruction (WMD) and other mass casualty events.

Leaders at Jackson Memorial formed a multidisciplinary Medical Advisory Board for WMD Response. The

board, consisting of approximately 30 medical school faculty and hospital staff members at the time of the study, had begun to create a response plan for conventional, chemical, biological, and nuclear WMDs and a plan to increase emergency department and hospital capacity. One of Jackson Memorial's senior trauma surgeons, a former officer in the Israeli Defense Forces, is guiding Jackson's mass casualty response program. Borrowing lessons from Israeli hospitals and a methodology developed by the Hospital Emergency Management Bureau of Israel's Ministry of Health, Jackson Memorial is developing a proposal for an integrated, metropolitan-area hospital response plan to mass casualty events. Leadership and championship within Jackson Memorial have propelled this effort.

Jackson Memorial approached the county Office of Emergency Management (OEM) to discuss developing a regional hospital response program and community agenda. In addition, Jackson Memorial requested that the OEM invite other hospitals and emergency response organizations to participate. Under the proposal, hospitals will sign a contract agreeing to accept patients transferred in an emergency. The plan will be financed through a fee structure in which larger-capacity, higher-tier hospitals will pay more than smaller-capacity, lower-tier hospitals. Jackson Memorial will insure the cost of care for indigent patients.¹⁰

Jackson Memorial drafted a white paper outlining this proposed plan for the OEM to use without attribution in its discussions with area hospital chief executive officers. Three-quarters of these CEOs agreed to the plan's patient triage and transfer arrangements. In 2004, peer training, community education about emergency medical planning, and community hospitals' role-specific

⁹ The Oregon Health Systems Collaboration was a Portland regional project developed by John King, a local leader, in response to the Clinton health reform proposal. It focused on collaborative hospital efforts to improve primary care and community health. While the project no longer exists, respondents suggested that it laid the foundation for a collaborative hospital culture and has contributed to hospitals' willingness in Portland to participate in interorganizational response planning.

¹⁰ Jackson Memorial Hospital is the safety-net hospital for 2.3 million area residents. In 2003, local taxes provided \$250 million in annual subsidies.

responses were identified as the highest priorities for the Miami-Dade OEM.

The Rural Health System Regional Planning Model

Good Samaritan Regional Medical Center in Corvallis, Oregon, is part of a multicounty rural health system consisting of five hospitals that share resources and staff during emergencies. The health system coordinates activities of member hospitals during disasters; its goal is to raise all member hospitals' resources and capacity to a specified minimum level. The health system is developing a concept for rural regional biological response centers in order to provide surge capacity for patients evacuated from a mass casualty disaster, bioterrorism, or an infectious disease pandemic in the Salem and Portland metropolitan areas to the north, home to most of the state's population.

In the event of a mass casualty disaster or public health emergency, each hospital in the Good Samaritan system will receive different categories of patients. Trauma patients will be directed to Good Samaritan Regional Medical Center in Corvallis, a Level 2 trauma center. Infectious disease patients will be diverted to a relatively isolated facility, which will discharge patients or transfer them to other hospitals. Medical inpatients will be directed to other hospitals in the system during the emergency. A shared communications system is being implemented for the five hospitals and community agencies that span three counties. The hospital and local community agencies have mutual aid agreements with institutions in nearby counties. The Oregon State University (OSU) stadium and health services center will be used as alternate care sites to accommodate large surges of patients. All community institutions—including OSU, Good Samaritan Health System, the county emergency management agency, health department, fire department, and EMS—engage in annual drills and exercises.

The Hospital-Directed, Tiered-System Regional Planning Model

Missouri, Louisiana, and Illinois have adopted a tiered system of regional medical surge response to disasters and mass casualty events. Under the tiered system, a designated regional hospital (DRH) coordinates the medical response to a mass emergency incident. During an emergency, the DRH can serve as a medical command post. It coordinates area medical disaster responses and admits the most critically injured patients to its own facilities. The DRH is supported by lower-tier hospitals that treat and stabilize less-serious injuries and receive less-acute transferred patients from higher-tier hospitals, freeing them to treat disaster victims. DRHs have the capacity and personnel to coordinate emergency planning and response internally and externally.

In states that have contracted with state hospital associations for preparedness planning services, a three-tiered model of hospital response has been developed. In Louisiana, each of nine multiparish regions has at least one DRH. This designation is voluntary and based on a hospital's bed capacity and willingness to assume a leadership role in responding to a public health emergency. Tier 1 hospitals must have an emergency room (which is not required in Louisiana) and be located within 45 minutes of a DRH. Tier 2 facilities, such as rehabilitation or psychiatric institutes, are not receiving hospitals, but in an emergency they can care for surge patients transferred from larger institutions. Louisiana, with only two Level 1 trauma centers, lacks an integrated statewide trauma system; however, many Louisiana hospitals offer Level 2, 3, or 4 trauma services. A goal of the state hospital association's regional planning approach is to integrate contiguous communities' emergency medical response surge capacity.

Illinois designates a lead, or POD, hospital, in each of 11 regions across the state to facilitate and lead hospital

disaster and emergency planning. (The term POD is not an acronym.) During a disaster or community public health emergency, the POD hospital coordinates emergency medical responses, manages EMS transport of patients to appropriate hospitals, and functions as a medical communications hub. It also provides information about available beds, supplies, equipment, and blood units at hospitals within its region. Only Level 1 and Level 2 trauma centers are qualified to serve as POD hospitals. Illinois POD hospitals are developing HRSA-funded regional surge capacity plans.

The Third Party–Directed, Tiered–System Regional Planning Model

The Missouri Hospital Association has an advisory committee of hospital and state health department representatives. Planners at the association work with the advisory committee to develop a tiered hospital preparedness and response structure that has been approved by the state. In addition, association planners identify coordination and communication gaps, aggregate information about hospital needs and problems, and provide hospitals with technical assistance.

In Missouri, Tier 1 hospitals are usually, but not necessarily, Level 1 trauma centers; Tier 2 hospitals have triage and stabilization capacity, but lack decontamination facilities and negative pressure rooms; while Tier 3 hospitals provide the minimum level of emergency response capabilities. In a mass casualty event or public health disaster, the St. Louis Metropolitan Medical Response System (SLMMRS) directs trauma patients to Tier 1 hospitals and distributes other patients across the network of Tier 2 and 3 community hospitals in the region, carefully balancing patient loads.

Tier 1 hospitals must meet the HRSA benchmark surge capacity standard to provide care for 500 mass casualties per million population in the region. These hospitals

possess significant capacity in infectious disease control, laboratory facilities, personal protective equipment, and staff training. Additionally, a Tier 1 hospital can be designated to handle biological, chemical or radiological incidents; there is at least one Tier 1 hospital per region in Missouri. Hospitals may work together to share decontamination equipment and portable negative-pressure rooms as well as staff, coordinating their emergency response activities to achieve Tier 1 capacity.

The Alternate Site Regional Surge Planning Model

Portland, Oregon, developed a Medical Care Points (MCPs) ambulatory surge capacity response plan for mass casualty events and public health emergencies to prevent hospital overcrowding by outpatients, provide definitive medical care, and improve disease surveillance. MCPs are predesignated field sites, activated by the county health officer and initially staffed by fire department EMS for ambulatory patient triage, treatment, prophylaxis dispensing, crisis counseling, and emergency transportation to hospital care. In a public health emergency, the regional poison control center, located at Oregon Health and Science University, will provide the public with professional health advice to reduce demand on hospital emergency rooms.

Over 80% of Oregon’s population lives in the Willamette Valley; consequently, Oregon’s health care resources and clinical expertise are concentrated in this area. Portland alone accounts for one-third of the total state population. The Multnomah County Health Department (MCHD) is the largest county health department in Oregon. EMS is housed within the MCHD and reports directly to its Medical Director. The health department operates a Single Dispatch System and standardized medical protocols. The Portland area has a regional mass casualty incident plan with Oregon Health and Science University serving as the area’s regional hospital.

Additionally, the Illinois POD regional hospital tiered-response system and the Corvallis rural response system address alternate site surge capacity. The POD hospital implements the state emergency response plan's regionalization goal to move stable victims and noncritical patients away from disaster-impacted regions to areas of the state that have not been affected; critical casualties are taken to hospitals in the immediate vicinity of the disaster. As previously discussed, the Corvallis health system in rural Oregon is developing "rural regional bio-response centers" to provide surge capacity for a Portland metropolitan area mass casualty event, natural disaster, or pandemic.

Summary

The case studies reveal steps taken to help ensure that hospital response plans are relevant to hospitals and fit appropriately within broader community-wide, regional, and statewide plans. These strategies include:

- Creating forums through which hospital representatives can advise the greater preparedness community
- Subcontracting state hospital associations to develop hospital plans on behalf of the state health department or to serve as the hospital liaison in an emergency event
- Consolidating various preparedness planning committees and federal funding streams into one committee

Stumbling blocks to interorganizational preparedness planning encompass undefined roles, unaligned accountabilities, and differing worldviews of participating organizations. Despite ongoing tensions between public and private entities, key informants are convinced that emergency preparedness requires a collaborative interorganizational approach. In many cases, calling all players to the planning table triggers collaboration. In locales where competition is an issue, third parties have been used as neutral organizations to receive and allocate funds, convene key players, and develop consensus and regional plans.

Many participants in the planning process stated that irrespective of the outputs, the process itself—meetings, drills, and exercises—has value. Networking and joint projects help establish communication between individuals and organizations and facilitate productive working relationships.



R E C O M M E N D A T I O N

HRET recommends the creation of a supplementary direct-grant program that targets both major urban and rural areas; preparedness activities and drills are dangerously underfunded in these places. Moreover, current CDC and HRSA cooperative preparedness grants to states should be not only maintained, but increased. These geographic areas require enhanced support in the form of intersectoral preparedness improvement grants. Urban and rural preparedness grants would fund two sets of activities: collaborative intersectoral and interorganizational planning committees, and intersectoral drills and exercises. Two types of planning advisory committees are proposed to oversee grant-funded activities: a regional intersectoral advisory committee, including citizens, leaders, stakeholders, public health, and hospitals; and a hospital-only advisory committee.

Formal goals for this new category of urban and rural grants include fostering clear and open communications between participants, helping participants learn about one another's attributes and perspectives, and developing professional and personal networks to support emergency response. In addition to collaborative planning committees, these urban and rural preparedness grants would require annual tabletop exercises and drills. Evaluations, surveys, and case studies would provide crucial feedback on successful strategies as well as areas that need improvement.

These grants should be managed by neutral third-party organizations, separate from the highly competitive hospital community. Our case studies suggest that appropriate third-party planning sponsors and fiscal intermediaries include county health departments, EMS, county medical societies, incorporated MMRS organizations, and freestanding interorganizational community preparedness committees.



C O N C L U S I O N

This study was designed to investigate how hospitals, public health agencies, and EMS collaborate on disaster preparedness planning and response programs. The eight study sites were selected because they represent relatively prepared and collaborative metropolitan and rural areas.

Three central themes related to preparedness and interorganizational collaboration emerge across all of the case studies and are repeatedly expressed by public health, EMS, and hospital stakeholders:

1. The importance of interpersonal, interorganizational, and intersectoral planning with stakeholder representation from multiple sectors
2. The essential role of interorganizational drills and exercises
3. The development of informal networks from participation in interorganizational planning committees and exercises

The case studies show that the process of collaboration develops interorganizational connectivity and helps organizations share big-picture understandings of the response network, individual organizational response capabilities, and informal professional and personal networks. Informal networks improve organizational and community-level response performance by building trust between participants and facilitating the flow of information across organizations. Participation in drills is equally effective in generating connectivity between organizations and among individuals.

The findings suggest that intersectoral and interorganizational planning committees with broad stakeholder participation can generate a shared understanding of complex, system-level problems and

oftentimes new solutions supported by all participants. Collaborative committees directly and indirectly address the problem of connectivity between fragmented organizations. Collaborations between hospitals, public health agencies, EMS, and other response partners have literally resulted in the development of shared communications systems, over and above surge capacity and emergency response plans.

The community case studies also indicate a disconnection between state and community preparedness planning processes in some rural and metropolitan areas. In 2004, highly collaborative case study communities, including Corvallis and Portland, Oregon, and Palm Beach County, Florida, had well-developed local planning committees and advanced response approaches that exceeded state levels of emergency preparedness. In these communities, informal networks arising from emergency preparedness collaboration were used to resolve conflicts between preparedness planning committees, and also assisted in gathering planning information and coordinating emergency responses.

Organizational complexity may be a factor limiting successful collaborative preparedness planning. Several informants in different states note that the complexity of the organizational environment may have slowed progress in several metropolitan areas. The most collaborative case study community examined, Portland, Oregon, is a relatively small metropolitan region in comparison to other case study cities. Conversely, the least collaborative organizational environment, Miami/Dade County, is among the largest metropolitan areas studied. Both rural communities, Corvallis and

Shreveport, are characterized by a high degree of collaboration, although Corvallis informants consider this a function of the local history of collaboration, rather than rural character.

The research findings have numerous implications for hospital preparedness planning and regional surge capacity. Collaborative interorganizational preparedness exercises promote well-coordinated responses and professional and personal networks—outcomes that enhance a community’s ability to respond to

unforeseen contingencies during an emergency. Interagency planning committees are a stealth component of the public health infrastructure, begging to be fully deployed building networks and mutual understanding among public health agencies, hospitals, EMS, and others. Finally, effective state level preparedness and response planning can greatly augment local and regional planning by developing uniformity and consistency across jurisdictions, shared communications systems, and mutual aid arrangements that support regional surge responses.

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