

HEALTHCARE COALITIONS: THE NEW FOUNDATION FOR NATIONAL HEALTHCARE PREPAREDNESS AND RESPONSE FOR CATASTROPHIC HEALTH EMERGENCIES

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After 9/11 and the 2001 anthrax letters, it was evident that our nation's healthcare system was largely underprepared to handle the unique needs and large volumes of people who would seek medical care following catastrophic health events. In response, in 2002 Congress established the Hospital Preparedness Program (HPP) in the U.S. Department of Health and Human Services (HHS) to strengthen the ability of U.S. hospitals to prepare for and respond to bioterrorism and naturally occurring epidemics and disasters. Since 2002, the program has resulted in substantial improvements in individual hospitals' disaster readiness. In 2007, the HHS Office of the Assistant Secretary for Preparedness and Response (ASPR) contracted with the Center for Biosecurity of the University of Pittsburgh Medical Center to conduct an assessment of U.S. hospital preparedness and to develop tools and recommendations for evaluating and improving future hospital preparedness efforts. One of the most important findings from this work is that healthcare coalitions—collaborative groups of local healthcare institutions and response agencies that work together to prepare for and respond to emergencies—have emerged throughout the U.S. since the HPP began. This article provides an overview of the HPP and the Center's hospital preparedness research for ASPR. Based on that work, the article also defines healthcare coalitions and identifies their structure and core functions, provides examples of more developed coalitions and common challenges faced by coalitions, and proposes that healthcare coalitions should become the foundation of a national strategy for healthcare preparedness and response for catastrophic health events.

OUR NATION IS UNDERPREPARED to manage large-scale, catastrophic health events that would require the use of the healthcare system (ie, beyond local emergency medical services [EMS] for triage, basic care, and transport) as a critical response component. Using a Department of Homeland Security (DHS) National Planning Scenario as an example, if an aerosolized anthrax attack occurred in a city the size of Washington, DC, more than 300,000 individuals could be exposed, resulting in 13,000 cases of inhalational anthrax. Most of these 13,000 cases would require critical care, but in the immediate region's 40 hospitals, the intensive care unit (ICU) surge capacity would be only

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about 400 beds, or 4% of the need, within 24 hours of recognition of the attack. Added to the hospitals' challenges would be large numbers of noncritically ill individuals seeking care in their emergency departments, the lack of rapid diagnostic tests for anthrax, health departments' mass dispensing of medical countermeasures to responders and the general public, management of patients with routine medical issues (eg, labor and delivery, fractures, heart attacks) who continue to need and seek care, and an ongoing criminal investigation.

The current state of healthcare preparedness is due in large part to the nation's healthcare system being chaotic, fractured, and traditionally not responsible for disaster preparedness and response. The ability of the system's approximately 5,700 hospitals¹ and countless other types of healthcare facilities and providers to effectively respond to catastrophic health events is further complicated by the fact that the provision of healthcare largely occurs in the private sector, while disaster preparedness and response have historically and primarily been coordinated by local, state, and federal agencies. Hospitals also have been largely overlooked in emergency planning because it has generally been assumed that once first responders transport patients to hospitals, the hospitals will be able to handle any and all healthcare needs resulting from an emergency. In addition, most emergency departments routinely operate at or above their capacity on normal days.

The events of 9/11 and the anthrax letters of 2001 underscored the critical role that hospitals and the healthcare system have in disaster response, particularly for events of national significance. During these unprecedented emergencies, the need to strengthen healthcare preparedness also became apparent. While hospitals in New York City and DC had disaster plans in place in 2001, the plans were largely inadequate to effectively address the surge in and unique medical needs of patients; hospitals encountered challenges in such areas as communications, patient tracking, and overcrowding.²⁻⁴ However, 9 years later—even after such extreme events as Hurricane Katrina⁵ and even with the availability of assets such as the National Disaster Medical System (NDMS), Federal Medical Stations, and the Medical Reserve Corps (MRC)—the nation still lacks a unified, national system for the healthcare response component of events that result in large numbers of patients—many with unique medical needs—and others seeking medical care. The 2009 H1N1 outbreak has provided further evidence of the impact that public health emergencies can have on hospital operations and of the need for better coordination and communication at local, state, and national levels during major health responses.⁶⁻⁸

HOSPITAL PREPAREDNESS PROGRAM

Recognizing that hospitals must become better prepared to handle the unique needs and often overwhelming volumes of patients following catastrophic health events, Congress es-

tablished the HPP* in 2002 in HHS “to upgrade the preparedness of the Nation’s hospitals and collaborating entities to respond to bioterrorism [and] ... allow the health care system to become more prepared to deal with non-terrorist epidemics of rare diseases.”^{9(p2)} The program originally focused on strengthening preparedness of individual hospitals for biological events, but the emphasis has evolved over time to encourage greater all-hazards coordination among healthcare facilities in the same community or region.

Initially overseen by the Health Resources and Services Administration (HRSA), the HPP is currently administered by ASPR. Hospitals in all 50 states, the District of Columbia, the nation’s 3 largest municipalities (Chicago, Los Angeles, and New York City), the Commonwealths of Puerto Rico and the Northern Mariana Islands, 3 territories (American Samoa, Guam, and the U.S. Virgin Islands), Micronesia, the Marshall Islands, and Palau participate in the program.^{†10}

Since the HPP’s inception, HHS has allocated \$2 billion in funding for preparedness and response efforts through cooperative agreements with awardees, which are state, territorial, and selected municipal public health departments (Table 1). The funding that individual awardees receive for each fiscal year is the sum of a fixed base amount and a variable amount that is proportional to the size of each awardee’s population. Awardees determine which hospitals to fund, how many hospitals to fund, and the level of funding to provide to each hospital. For each fiscal year, HHS also provides detailed guidance to awardees as part of the grant application process.¹¹

Overview of Project Deliverables

In 2007, ASPR contracted with the Center to conduct a 2-year, comprehensive assessment of U.S. hospital preparedness from the time of the establishment of the HPP in 2002 through mid-2007 and to develop tools and recommendations for evaluating and improving future hospital preparedness efforts. The major deliverables for the project are the following:

- *Descriptive Framework for Healthcare Preparedness for Mass Casualty Events* (Descriptive Framework)¹²—A

*The program was originally named the National Bioterrorism Hospital Preparedness Program (NBHPP), but was changed to the Hospital Preparedness Program (HPP). The program name was recently renamed the National Healthcare Preparedness Program (NHPP). For the purposes of this article, we will refer to the program as the HPP.

†Approximately 13% of U.S. hospitals do not participate in the program; many of these are small, critical access facilities located in rural areas. While some do not participate at all in emergency preparedness activities, many do actually engage in preparedness work, but not in an official capacity through the HPP. Other nonparticipating hospitals may include IHS and VA hospitals.

Table 1. Hospital Preparedness Program Funding, FY2002-FY2010

<i>Fiscal Year</i>	<i>Funding (\$ millions)</i>
2002	135
2003	515
2004	515
2005	487
2006	474
2007	474
2008	423
2009 (estimate)	394
2010 (budget)	426
Total	3,843

Source: U.S. Department of Health and Human Services. *FY2010 Budget in Brief*. Washington, DC: U.S. Department of Health and Human Services; 2009. <http://www.hhs.gov/asrt/ob/docbudget/2010budgetinbrief.pdf>. Accessed May 11, 2009.

conceptual model of local and regional hospital and healthcare system preparedness for mass casualty events that outlines the essential elements of hospital disaster preparedness at several levels: the individual healthcare institution, the healthcare coalition, and state and federal governments (February 2008).

- *Hospitals Rising to the Challenge: The First 5 Years of the Hospital Preparedness Program and Priorities Going Forward* (Evaluation Report)¹³—An assessment of HPP accomplishments from 2002 to 2007 and the impact of the program on hospital and community preparedness based on the Descriptive Framework, interviews with 133 hospital disaster experts and coordinators (working group), existing peer-reviewed literature, and an issue analysis meeting (March 2009).
- *Preparedness Report*—A definition (ie, a goal or vision of success) of hospital preparedness for the U.S. healthcare system moving into the future, with short- and long-term steps that should be taken to achieve the new vision; based on the Evaluation Report, a literature review, and an analysis of the disaster healthcare system from the perspective of complex systems theory (Fall 2009).
- *Provisional Assessment Criteria*—Criteria that HHS could use in evaluating the preparedness of HPP grant awardees (Summer 2009).
- *Evaluations of the Healthcare Facilities Partnership Program (HFPP) and Emergency Care Partnership Program (ECP)*—Evaluations of the effectiveness, efficiency, and impact of 9 of the 11 demonstration grant programs in the competitive HFPP[‡] and of the 5 demonstration

projects in the ECP,[§] and policy recommendations for moving both programs forward (Summer 2009).

This article focuses on and is largely derived from the healthcare coalition findings in the Descriptive Framework and the Evaluation Report.

Definition of Healthcare Coalition

The Evaluation Report found that the preparedness of individual hospitals has significantly advanced since the establishment of the HPP in 2002. For example, hospital senior leadership is engaged in disaster planning, and hospitals have appointed disaster coordinators to oversee preparedness and response efforts. Hospitals also have been involved in emergency operations planning and training, stockpiled and tracked equipment and supplies, established systems for achieving situational awareness and communications capabilities, conducted rigorous exercises, and made dynamic improvements to their emergency operations plans (EOPs). These activities are critical for responding to routine emergencies and mass casualty events (eg, bus crashes and other local hazards) that can be handled by a single hospital or several hospitals in a community without significantly disrupting hospital operations.

However, during large-scale, catastrophic events, such as an aerosolized anthrax attack in a city, individual healthcare facilities within a community will have to collaborate with each other, with their community's emergency response system, and possibly with neighboring jurisdictions to effectively care for victims and manage local staff, space, and supplies. Specific challenges include distributing and tracking patients, sharing assets and resources, using volunteers,

[‡]In 2007, this HHS program provided 11 healthcare partnerships with a total of \$18.1 million to develop programs to enhance community and hospital preparedness for public health emergencies. Projects focused on "planning for the surge of patients and its regional impact during major public health emergencies; improving regional public health emergency coordination through innovative approaches to training, communications and new software; or developing and conducting functional public health emergency exercises to evaluate community and hospital preparedness."¹⁴

[§]In 2007, this HHS program was announced to grant "\$25 million to hospitals and other health care facilities via a competitive emergency care grant program focused on hospital surge capacity, emergency care system capability, and community and hospital preparedness for public health emergencies." Projects were to focus on helping to "integrate public and private emergency care system capabilities with public health and other first responder systems," "[i]mproving the efficiency, effectiveness and expandability of emergency care systems ... with respect to public health emergencies," and developing "plans for strengthening public health emergency medical management."¹⁵

operating alternate care facilities (ACFs), allocating scarce resources, and implementing disaster standards of care. Without coordinating response activities that require a multi-facility effort, it would be impossible for healthcare institutions to respond optimally. Pre-event planning and other preparedness activities must also be coordinated so that emergency plans are synchronized and communication links are established in advance of emergencies. The mechanism for coordinating these types of collaborations is the healthcare coalition.

We define a *healthcare coalition* as a formal collaboration among hospitals, public health departments, emergency management and response agencies, and possibly other types of healthcare entities in a community that are organized to prepare for and respond to mass casualty and catastrophic health events. Coalitions are not intended to replace individual hospital preparedness; rather, a hospital's participation in a coalition augments that hospital's preparedness to respond to more catastrophic and severe emergencies that would require a coordinated community, regional, or national response to maximize patient outcomes.

Healthcare coalitions are needed throughout the U.S. to address emergency preparedness and response challenges that cannot be addressed by individual institutions acting alone. Prior to the HPP, this type of collaboration did not exist in most communities. The HPP has been one of the key factors driving the development of healthcare coalitions,¹⁶ and all working group participants indicated that some sort of healthcare coalition has developed in their communities after the start of the program in 2002.

Relationship to the HHS Medical Surge Capacity and Capability Handbook

Starting in FY2006, HPP guidance required HPP grant applicants to describe how their jurisdictions and preparedness activities corresponded with the emergency management structure outlined in HHS's *Medical Surge Capacity and Capability [MSCC] Handbook*,¹⁷ which is a guide for implementing systems for managing medical and health preparedness and response to emergencies (Figure 1). With this approach, disaster response is organized into 6 tiers that are integrated vertically from local to state to multistate to federal; coordination follows the principles of incident management as outlined in the National Incident Management System (NIMS). The handbook uses the term *healthcare coalition* to refer to a group of individual healthcare facilities (tier 2) working together to maximize healthcare surge capacity through cooperative planning, information sharing, and emergency management coordination.

We found that healthcare coalitions typically serve as organizations that facilitate interaction among the first 3 MSCC response tiers: asset management at individual

healthcare facilities (tier 1), healthcare coalitions (tier 2), and local jurisdictional response agencies (tier 3). As described in the Descriptive Framework and Evaluation Report, the definition of healthcare coalition has evolved to increasingly and more routinely include local or state response agencies, such as EMS, emergency management, and public health, and other private, nonhospital healthcare partners (eg, pharmacies, professional associations, medical equipment vendors).

STRUCTURE AND CRITICAL FUNCTIONS OF HEALTHCARE COALITIONS

History, politics, existing relationships (eg, among healthcare institutions and with public health and emergency management agencies), hazards, geography, and culture all contribute to developing and operating the optimal healthcare coalition in each community. Despite differences in their evolution, composition, and structure, healthcare coalitions share several common, yet critical, core functions. However, the way in which individual locations develop and carry out these functions cannot be prescribed. Coalition effectiveness is not dependent on the way in which the coalition forms, evolves, and functions, but rather on leadership and the members' degree of commitment. This section outlines the core functions related to healthcare coalition planning and process (eg, organization and governance structure, geography, membership, and training), communications, situational awareness, surge capacity, allocation of scarce resources, and alternate care facilities.

Planning and Process

Organization and governance

Coalitions have been formed by building on preexisting structures or entities (eg, Metropolitan Medical Response System [MMRS] groups), having the public health department serve as the organizing body, having a dominant hospital system bring neighboring hospitals together, or collaboratively creating an entirely new body. Compacts or mutual aid agreements, or both, are typically used to establish healthcare coalitions; these cooperative agreements enable resource reallocation and sharing, patient redistribution, and coordinated use of alternate care sites. Operational authority to compel action on the part of coalition members, if needed during an emergency, may be derived from and contingent on the local or state government's emergency police powers when the state or locality declares a public health or other type of emergency or disaster.

Working group participants reported that a defined governance structure is critical to the success of coalitions, because an individual or a distinct body must be driving the effort; this goes beyond simply signing mutual aid agree-

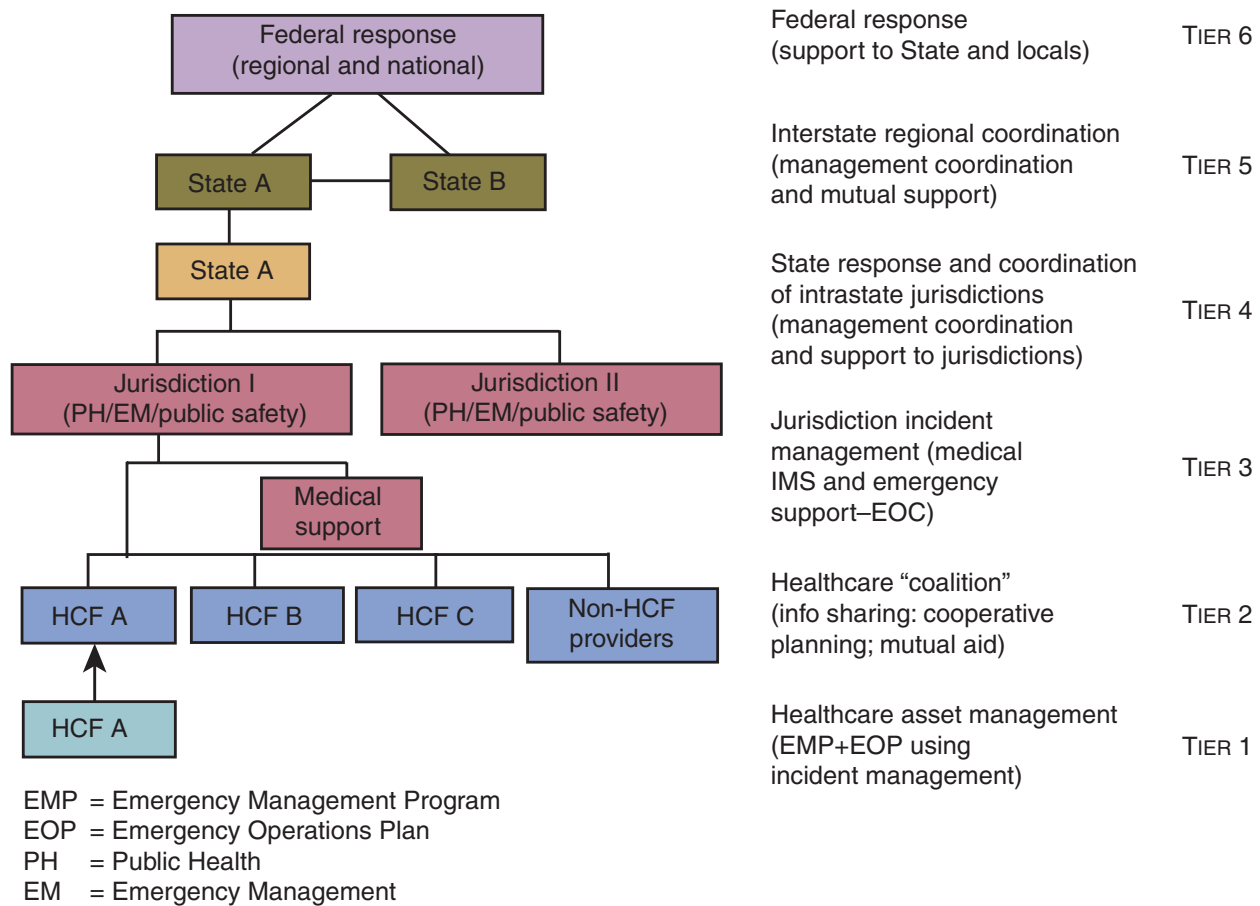


Figure 1. HHS Medical Surge Capacity and Capability (MSCC) Framework¹⁷

ments. We found that the governance structures of and legal authorities vested in the coalitions are highly variable. Some coalitions are formal legal entities, such as nonprofit corporations with paid executive officers; in these groups, representatives of member organizations vote on policy decisions. Other coalitions act as committees that are impaneled by and derive official authority from the public health department. More informal coalitions do not have a formal governance structure or official authority; rather, the members participate on a purely voluntary basis and work by consensus. However, participants confirmed that a defined governance structure that has, at a minimum, formal agreements between member organizations and defined leadership is critical to the success of coalitions.

Geography

The geographic boundaries of healthcare coalitions are highly variable, and the definition of *community* must remain flexible to incorporate local needs and realities. The essential feature is that every hospital in the chosen geographic area is included. In some places, the coalition may be composed of all hospitals and other members within a county or a city, while in others members may be from an

entire state. In some small or low population density states, a single coalition may represent all hospitals and relevant partners in the entire state. In some large cities, the jurisdiction may be divided into more manageable sub-municipal regions, so that a single city might have multiple coalitions. In many locations, coalitions cross jurisdictional borders and are not aligned with the normal geographic boundaries of all individual coalition members. This is because the public health, EMS, and emergency management regions are often not aligned with one another or with political boundaries. Also, the normal referral patterns and alliances among hospitals rarely follow jurisdictional maps. Some coalitions, such as the National Capitol Region, encompass multiple states and political jurisdictions.

Membership

At a minimum, a healthcare coalition includes representatives from all or most of the local acute care hospitals (including Department of Veterans Affairs and Indian Health Service hospitals, if applicable), public health departments, emergency management agencies, and EMS within the geographic area of the coalition. A connection to the local/state incident command system (ICS), in collaboration

with public health authorities through Emergency Support Function (ESF)-8 of the National Response Framework (NRF),¹⁸ enables integration into the overall disaster response.

The composition of coalitions ranges from including primarily hospital representatives (ie, a coalition comprised of hospitals interfaces with the public health department, which serves as the link between the coalition and the local emergency management agency) to directly and actively involving all hospitals, other healthcare facilities, public health departments, and response agencies in the community or region as equal partners. In many locations, the inclusion of additional healthcare entities, such as specialty hospitals, long-term care facilities, dialysis centers, free-standing clinics, and surgical centers, has been beneficial. Some coalitions reach out even further to include medical equipment vendors, private ambulance companies, and pharmacies.

Hazard Vulnerability Analysis

Healthcare coalitions jointly analyze and prioritize threats to the community so that all members use the same hazard assumptions in developing their individual hazard vulnerability analyses (HVAs) and emergency operations plans. At a minimum, each HVA should consider: (1) local natural hazards (eg, hurricanes in the Southeast, tornados in the Midwest, earthquakes in the West); (2) the DHS National Planning Scenarios, within the context of the federal, state, and local planning; and (3) disasters in which the community could be cut off from outside support and/or in which the community's basic infrastructure is disrupted. The HVA should also consider special needs populations and the impact of a large, geographically remote event wherein the community becomes a refuge for displaced or evacuated patients. Members share their HVAs with one another so that each member is aware of the needs of other members and the type of mutual aid that might be available or needed.

Emergency Operations Planning, Training, and Exercising

Based on shared HVAs, coalitions plan collaboratively, which informs the development of individual institutions' emergency operations plans and facilitates more coordinated responses. They also engage in joint training activities. This facilitates the creation of an interoperable workforce and allows for more efficient and effective sharing of personnel during an emergency. Healthcare coalitions often exercise together based on their joint planning and training, which enables the testing and refinement of plans for a coordinated community-based response.

All respondents reported that their locations engage in collaborative planning with other healthcare organizations in their communities. This may mean joint decision making about HPP grant priorities and sharing individual

emergency preparedness plans, or engaging in a more comprehensive and collaborative community planning process. The strongest coalitions conduct joint threat assessments and create community emergency response plans that inform the planning process at individual hospitals.

Communications

Reliable communications among emergency response partners and unified messages are essential for effective emergency response. For mass casualty events within a community, this requires redundant and interoperable communications equipment and systems (eg, internet-based programs for disseminating information about patient volumes and assets, 800MHz and ham radios for talking to one another if phones go down) that allow for the rapid exchange of information among member institutions, as well as to and from local and state agencies within the incident command system. The coalition also provides a platform for jointly crafting messages for decision makers and the public. In larger-scale emergencies involving more than one community or coalition, mechanisms for sharing information among neighboring coalitions are needed.

All hospitals in our research reported having a mechanism for connecting to the local or state incident management structure, but the connections vary. Many participants said that healthcare coalitions can and should be the link between hospitals and the ESF-8 seat in the local or state emergency operations center (EOC) by serving as the clearinghouse for patient volumes, healthcare assets, and other critical healthcare information. Because NIMS does not incorporate the concept of a local healthcare coalition, the coalition does not have a formalized role in disaster response in many jurisdictions. Emergency information flows directly to and from individual hospitals and public health agencies, with the public health department acting as the liaison between the health sector and the rest of the ICS through the health and medical seat in the local or state EOC. Some locations have created healthcare EOCs that act as an intermediary between the hospitals and the ESF-8 seat at the EOC. During events where assistance from outside the healthcare sector is not needed or is minimal, these healthcare EOCs can be activated independently of the local or state EOC.

Situational Awareness

A healthcare coalition serves as the information clearinghouse for healthcare institution data during emergencies. For optimally distributing patient load within a community, real-time data on the number of available beds and the estimated surge capacity of each healthcare institution is needed. This information must be in a standard format that can be quickly compiled and used by the coalition in cooperation with local EMS. Real-time data on the avail-

ability of member assets and resources is needed to facilitate the sharing of scarce resources within the coalition. The coalition also plays an essential role in informing local and state response agencies about what is going on in the healthcare institutions, what the institutions' capacities and capabilities are, and what they need. Healthcare coalitions also need information from the community's ICS about the event, the number and types of patients to expect, and the availability of outside assistance. The coalition can play an important role, in cooperation with public health agencies, emergency management agencies, and elected officials, in keeping the public informed. Lastly, the coalition should provide expert medical advice to the local government authorities.

Surge Capacity: Staff, Supplies, and Space

Healthcare institutions vary considerably in their surge capacity and capability, as well as in the amount of personnel, supplies, and equipment they have. An optimal medical response to an emergency requires matching patient load with available resources. Naturally, individual institutions are likely to be hesitant to share resources that they think they might need later in the course of an emergency. Healthcare coalitions should serve as an honest broker and trusted source of information for decisions regarding allocation of resources in an emergency; maintain procedures for recruiting, credentialing, training, and deploying volunteer healthcare workers in conjunction with local MRC and state Emergency System for Advance Registration of Volunteer Health Professionals (ESAR-VHP) programs;** engage in joint purchasing to ensure interoperability of supplies and equipment and economies of scale; and develop standards for interoperable equipment, communications equipment, training, and drills.

All locations reported participating in joint exercises, as required by the HPP and Joint Commission. Healthcare coalitions are also involved in HPP-funded joint training activities, which results in cost efficiencies and training uniformity across institutions. Many coalitions engage in

joint purchasing. Most often, this involves using HPP grants to purchase equipment, supplies, or pharmaceuticals. These purchases have also been used to more cost-effectively develop joint stockpiles and interoperable materiel.

Many locations have implemented or are developing programs, including MRC, ESAR-VHP, local Disaster Medical Assistance Teams (DMATs), and MMRS, to organize healthcare volunteers for disaster responses. It is unclear, however, how these programs relate to the healthcare coalitions that are developing, but a goal of ESAR-VHP, for example, is to assist state recipients of HPP grants in establishing a preregistration system of volunteer health professionals. It is also unclear how these programs will be coordinated at the local and state levels and connect to the overall incident command structure during a disaster. While healthcare coalitions could play a key function in addressing the coordination challenge, few locations reported having accomplished that.

Scarce Resource Allocation

When optimal distribution of patient load, sharing of resources, and mutual aid are insufficient to relieve the mismatch between patient volumes and scarce resources in overwhelmed healthcare institutions during an emergency, changes in the ways that patient care is delivered must be implemented. Such decisions are inherently difficult and fraught with ethical and legal challenges. However, it is essential that, to the greatest extent possible, any changes in the standards of patient care and any allocations of scarce resources are consistent across a community. Resource allocation policies require considerable time and effort prior to an emergency and should also take into account the role of elected officials in making and communicating these decisions.

Healthcare coalitions should serve as honest brokers for these challenging discussions and decisions. Because patient load and resource shortages may differ from one healthcare institution to another during an emergency, coalitions should facilitate discussions among members about how, when, and by whom decisions to alter standards of care will be made to ensure consistency and fairness. To further ensure uniformity during a mass casualty response, coalition members should also jointly develop guidance for allocating scarce resources, identify alternate care sites and operating procedures (eg, staffing ratios and types of patients to be treated) in cooperation with local and state agencies, and develop plans for managing the "worried well" (ie, concerned individuals seeking evaluation for potential health effects of a disaster). We found consensus among participants that, for each of these efforts, the input of multiple segments of the community is required for plans and decisions to be accepted by healthcare providers and the public, and that healthcare coalitions often facilitate this input process.

**In 2002, Congress authorized the development of ESAR-VHP through Pub. Law No. 107-188. Each state-based system will include verifiable information about the identity, licensing, credentialing, and accreditation of individual volunteers, which will give states the ability to quickly identify, better utilize, prioritize, and facilitate interstate sharing of volunteer health professionals during emergencies. HPP guidance requires HPP participants to accomplish certain goals for ESAR-VHP as a state-level performance measure, and states have been encouraged to use HPP funding to support the implementation of ESAR-VHP. Initially administered by HRSA, the program is now administered by ASPR.

Alternate Care Facilities

In many locations, coalitions also engage in some level of alternate care facility planning and could play an important role in coordinating the optimal use of ACFs. For example, coalition members could jointly identify ACF sites, ensure the use of uniform triage criteria for patients being referred to ACFs, and coordinate ACF staffing if drawn from member organizations. Relatively few locations, though, reported significant collaboration between healthcare institutions and public health agencies around ACF planning or operation. In some cases, the public health department coordinates planning, while in other cases, individual hospitals or coalitions fill that role.

EXAMPLES OF MORE DEVELOPED HEALTHCARE COALITIONS

Los Angeles County

The Disaster Resource Center (DRC) program in California was developed after Los Angeles County, which has more than 100 acute care hospitals for 10 million people, received a direct HPP grant to coordinate planning, training, exercises, and participation in developing a regional disaster plan.¹⁹ The DRC coordinates surge capacity planning, facilitates drills and exercises, stockpiles pharmaceutical caches, procures supplies, conducts personal protective equipment (PPE) and decontamination training, and facilitates communications planning. The coalition has also developed regional disaster plans and facilitated increased interhospital communication. In the program, 13 hospitals have been designated as DRCs; each serves as a hub for 8-10 additional umbrella hospitals.

Minneapolis

The Minnesota Department of Health (MDH) uses a tiered approach to response based on local coalitions (compacts) of hospitals and healthcare institutions that work with 8 Regional Hospital Resource Centers (RHRCs). MDH awards HPP funds to each of the RHRCs (these are public health regions, which differ from the state's 6 emergency management regions). Each RHRC collaboratively develops a budget and divides the funds among partners. The Metropolitan Hospital Compact was established in 2002 as a coalition of 29 healthcare facilities (representing 6,600 beds) in 7 counties (covering over half of the state's population) in the Minneapolis, Minnesota, region. Hennepin County Medical Center (HCMC), which is the region's RHRC, oversees the Metropolitan Hospital Compact and allocates the HPP funding from MDH to the 29 hospitals. The compact organizes its projects into 8-12 work groups based on grant deliverables

and guidance. Metropolitan Hospital Compact partners include MDH, the Metropolitan Medical Response System, UASI, the American Red Cross, the Information Sharing and Analysis Center, the Metropolitan Emergency Services Board, Homeland Security and Emergency Management, the University of Minnesota, Hennepin County MRC, and the Metropolitan Local Public Health Association. Nineteen of the 29 healthcare facilities also participate in NDMS. Hennepin County Medical Center also applied for and received an HFPP grant in 2008 on behalf of the compact; during that year, HCMC did not receive any HPP funds from the state, but coordinated several projects (eg, the mobile medical unit) with them as part of the grant.

New York City

The New York City Department of Health and Mental Hygiene hosts a coalition of hospitals, primary care centers, long-term care facilities, emergency management services, professional associations, and medical university partners to coordinate emergency preparedness activities through the New York City Healthcare Emergency Preparedness Program (HEPP), a government-healthcare partnership that has been funded primarily by the HPP since 2002. The program includes 65 hospitals and acute care facilities, 400 outpatient centers, 73 EMS organizations, and representatives from public safety, emergency management, and public health agencies; medical societies; and hospital associations. The program has built an integrated and coordinated emergency planning and response effort. Achievements include use of a hazard vulnerability analysis, implementation of an incident command system, development of linkages with unaffiliated medical facilities and city agencies, performance of exercises, and participation in citywide drills for integration into the city's emergency response system. The coalition works together to meet critical benchmarks identified as gaps in needs assessments, such as isolation capacity, trauma and burn care, and pharmaceutical capacity. All hospitals receive core funding for essential emergency preparedness activities; these funds are supplemented by other funds, based on certain deliverables.²⁰

Seattle and King County

The King County Healthcare Coalition in Seattle is a coalition of approximately 25 hospitals and more than 200 other healthcare organizations (eg, clinics, nursing homes, and dialysis centers) working with the county public health department. The coalition, which covers a population of 1.8 million people, was developed in 2005 to facilitate regional communication, strategic acquisition and management of resources, and collaborative planning in response to emergencies and disasters.²¹ Using King County HPP funds and local resources, this healthcare coalition coordi-

nates joint training, exercises, resource and information management, and surge planning (eg, call centers, evacuation, and volunteer management). The group facilitates members' achieving more than half of the Joint Commission emergency management standards. During a disaster, the coalition operates as a part of a health and medical area command structure led by Public Health—Seattle & King County to integrate health care into the policy and decision making structure and to coordinate information and medical resource management.

CURRENT CHALLENGES FACED BY HEALTHCARE COALITIONS

Even though the emergence of healthcare coalitions has contributed to greater preparedness in the U.S. healthcare system, several challenges in their development remain. Despite these challenges, nearly all participants in our research stated that the creation and continued development of healthcare coalitions were critically important for disaster preparedness. Key challenges include:

- *Sharing proprietary information.* Most leaders of healthcare organizations—particularly those with firsthand experience with large-scale disasters—recognize that it is in their best interest to collectively prepare for and respond to emergencies. However, many hospitals have been reluctant to share potentially sensitive proprietary information, such as bed status, with their competitors.
- *Facing insufficient funding and staffing shortages.* Many hospitals make their own financial contributions—above the HPP funding—to individual preparedness and also contribute staff time and other resources to healthcare coalition work. Some hospitals facing financial difficulties have been reluctant to authorize personnel to attend coalition meetings. In addition, staffing shortages in public health departments can make it difficult for officials to participate in a coalition, and some of these officials are reluctant to participate because they believe hospital preparedness is beyond the mission of public health.
- *Addressing varying geographic regions.* The inconsistent municipal, public health, emergency management, and EMS regional boundaries in many states, and the fact that healthcare coalitions may cross various intrastate and interstate lines, contribute to the complexities of collaborative planning. This, as well as the Federal Emergency Management Agency (FEMA) and HHS regions, will also complicate planning and response for emergencies that occur on a larger regional or national scale.
- *Allocating HPP grants.* In some states, a large proportion of HPP funds is used by the state or by substate regions for joint activities, with a relatively small percentage being directly allocated to hospitals. Some hospitals have withdrawn or threatened to withdraw from their coalitions

because the insufficient funding does not enable them to effectively adhere to the program guidance, particularly as it has become more rigorous.

- *Sustaining gains in preparedness.* Many healthcare coalitions are concerned about losing the advances in preparedness that they have achieved if HPP funding becomes unavailable or is substantially decreased. While many partnerships might continue to function—in large part because of preexisting collaborative dynamics in the community and the critical relationships and capabilities that have developed through the HPP—they would likely either do so in a much more limited way or would be unable to significantly improve on their efforts.

HEALTHCARE COALITIONS: THE NEW FOUNDATION FOR HEALTHCARE PREPAREDNESS AND RESPONSE FOR CATASTROPHIC HEALTH EVENTS

The development of healthcare coalitions has been the single most important step toward preparing the U.S. healthcare system to respond to large-scale mass casualty disasters. These coalitions are essential for executing effective responses to such events, which may require a collaborative response that exceeds the capabilities of a single healthcare facility. The emergence and success of these coalitions across the country also presents a critical and unique opportunity for the development of a more comprehensive national disaster health and medical response system. This is because the work of existing and developing healthcare coalitions is creating a foundation for the level of national healthcare preparedness that is needed in the U.S.

The 2009 H1N1 outbreak has provided further evidence of the need during a national or international health emergency for hospitals and healthcare providers to coordinate with one another and with their emergency management partners and to have access to timely, accurate, and consistent emergency information (eg, clinical guidance on diagnostic testing and on the use of antivirals and N-95 respirators) from local and state health departments, HHS, and the U.S. Centers for Disease Control and Prevention (CDC). It has also underscored the need for hospitals and public health departments to coordinate with one another and for the federal government to have current situational awareness of such indicators as case numbers, severity of illness, emergency department surge, and medication and other supply shortages so that it can optimally respond to meet the needs of patients, hospitals, health departments, response agencies, and other providers throughout the nation.

A primary challenge, though, of building a functional and robust national disaster health and medical system is formally knitting the different healthcare coalitions together into a cohesive system that can rapidly, effectively,

and efficiently tap into all applicable local, state, federal, and private sector response assets and systems during a catastrophic health emergency. The next phase of this project will focus on how to build and integrate healthcare coalitions into such a system. However, a national system of fully functional coalitions capable of effectively responding to large-scale disasters that require the healthcare assets of an entire region or the country is unlikely to develop without further federal direction and support. Therefore, we recommend:

- Promoting and fostering the development, maturation, and sustainment of healthcare coalitions in every state throughout the country.
- Elevating the significance and formalizing the role of the healthcare system in national response planning at the local, state, and federal levels of government.
- Developing a national concept of operations for health care to supplement the current HHS MSCC framework and DHS NRF and to serve as a default plan if local or state incident management approaches fail (eg, if all lines of communication are severed during an emergency or if the formal ICS approach otherwise breaks down).
- Engaging all healthcare providers, including primary care physicians and clinics, in healthcare coalitions.
- Creating and fostering strong linkages between geographically adjacent healthcare coalitions, regardless of jurisdictional, political, and emergency management boundaries.
- Ensuring stable and sufficient levels of federal funding for healthcare preparedness and response efforts at the healthcare coalition level.

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