COMMENTARY

Health Care Coalitions as Response Organizations: Houston After Hurricane Harvey

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ABSTRACT

Health care coalitions play an increasingly important role in both preparedness for, response to, and recovery from large scale disaster events occurring across the United States. The actions taken by the South East Texas Regional Advisory Council (SETRAC) in response to the landfall of Hurricane Harvey, and the consequential flooding that ensued, serve as an excellent example of how health care coalitions are increasingly needed to play a unifying role in response. This paper highlights a number of the strategic planning, operational planning and response, information sharing, and resource coordination and management activities that were undertaken for the response to Hurricane Harvey. The successful response to this devastating storm in the Houston, Texas area serves as an example to other regions across the country as they work to implement the 2017-2022 health care capabilities articulated by the Department of Health and Human Services Office of the Assistant Secretary for Preparedness and Response. (*Disaster Med Public Health Preparedness*. 2017;11:637-639)

Key Words: disaster preparedness, hospitals, health care systems, disaster medicine, hurricane response

The health care sector is considered 1 of 16 "critical infrastructure sectors" described by the Department of Homeland Security as being, "…so vital to the United States that their incapacitation or destruction would have a debilitating effect on security, national economic security, national public health or safety…."[1] And yet, over many decades, multiple disasters have demonstrated the vulnerability of health care facilities to extreme events, including earthquakes (Loma Prieta, 1989; Northridge, 1994), storms and hurricanes (Allison, 2001; Katrina, 2005; Sandy, 2012; Harvey, Irma, and Maria, 2017), floods (Iowa City, 2008; Fargo, 2009), and tornados (Joplin, 2011).

The U.S. Department of Health and Human Services (HHS) Office of the Assistant Secretary for Preparedness and Response (ASPR) is responsible for the preparation, response, and recovery of the health care system in disasters. Within ASPR the Hospital Preparedness Program (HPP) funds health care preparedness efforts, which serves as the only source of federal funding for health care system preparedness and response. HPP initially provided funds to public health departments in all states, territories, Washington, DC, Chicago, Los Angeles County, and New York City, to build surge capacity for individual hospitals. Since 2012, the HPP has encouraged its awardees to invest in forming partnerships and developing health care coalitions (HCCs).

HCCs are groups of individual health care and response organizations (eg, hospitals, EMS, emergency management, public health agencies, etc) co-located in a defined geographic location. They coordinate activities among health care organizations and other stakeholders in their communities with particular emphasis on strategic planning, operational planning and response, information sharing, and resource coordination and management activities. The overall intent is to engage in proactive management of a disaster event that impacts health care services. The 2017 hurricane season serves as a reminder of the fragility of health care service delivery during catastrophic storms. The response of the Houston-based health care coalition demonstrates the return on investment HPP funding has had in one community.

HURRICANE HARVEY AND THE RESPONSE IN HOUSTON

South East Texas Regional Advisory Council (SETRAC) is 1 of 22 Regional Advisory Councils (RAC) formed under Texas law in 1989 to develop trauma systems for a geographically-defined region (Trauma Service Area). Over the years, the role of the RAC expanded to include care systems for stroke, STEMI, pediatrics, and injury prevention. Since 2001, the Texas Department of State Health Services sub-contracted with the RAC to administer ASPR HPP funds into the Regional Healthcare Preparedness

Coalition (RHPC). After expanding in 2012, the Coalition now includes 25 counties, 277 cities, 9.3 million people, 180 hospitals, 200 EMS agencies, and over 900 nursing homes.

The RHPC Board is a representative model of governance comprised of representatives from emergency medical services, city and county public health agencies, city and county emergency management agencies, long-term care facilities, law enforcement agencies, and hospital-based emergency medicine departments. The Board outlines the strategic vision and planning efforts and with assistance from SETRAC staff, help to direct the preparedness planning and response needs of the community.

The Catastrophic Medical Operations Center (CMOC) is the response arm of the RHPC and provides coordination, situational awareness, and resource allocations for the medical components of the health and medical emergency support function (ESF-8) response. The concept of the CMOC started in 2001 after Tropical Storm Allison dropped 30-40 inches of rain in 5 days over the Greater Houston area. This resulted in extensive flooding and evacuations of 3000 acute care beds and 500 ICU beds from 4 health care facilities in the Texas Medical Center. The after action analysis developed at the conclusion of the event suggested a need for the development of a single coordinating entity to help preserve the medical infrastructure during a disaster.

The CMOC was first activated in 2005 after the influx of 250,000 evacuees from New Orleans following Hurricane Katrina and successfully placed 1100 individuals into health care facilities without overloading any one facility. A few weeks later, the CMOC was reactivated to coordinate evacuations from 29 hospitals and 121 nursing homes for Hurricane Rita. In 2008 the CMOC coordinated medical services for Hurricane Ike, with 56 hospitals and 220 nursing homes evacuated and repopulated. This led to the development of Oxygen Strike Teams, Ambulance Staging Managers, Dialysis Transport Circuits and Forward Coordinating Units, that are now a part of the Texas Disaster Medical System.

Since 2008, the CMOC was activated for major public events—the Super Bowl, NCAA Final Four, and Freedom Over Texas celebration—as well as for localized rain events that have caused extensive flooding and subsequent evacuation of nursing homes and individuals. CMOC can formally be activated by a public health, jurisdictional, or state designated official.

Hurricane Harvey brought unique challenges. Weather reports predicted that that the storm would directly strike the SETRAC region and widespread flooding was likely. The CMOC was activated the morning of anticipated landfall with mobilization of 4 lead functional roles—Chief, Clinical Director, Transportation Coordinator, and Logistics Supervisor. Pre-activation conference calls were held with hospitals and nursing homes in the Coalition to update them on the storm, predicted rainfall, and current activities. Recommendations were made to facilities to prepare their patient manifest in case they needed assistance, and if they were considering evacuation to complete the evacuation by noon the next day. Those planning to shelter-in-place were encouraged to prepare their facilities for several unsupported days.

Hurricane Harvey caused epic rainfall in 23 of 25 Coalition counties, with some areas receiving over 60 inches of rain in 2 days. Two reservoirs in a highly populated area of Houston were in danger of being breached so thousands of gallons of water were released over several days to avoid a catastrophic dam failure.

CMOC briefings were held twice a day on site, which included partners from the HHS and military, to provide operational status updates, objectives for the operational period, challenges, concerns, current status and forward planning needs. Daily conference calls were held for the hospitals and nursing homes to understand their functional status, provide updates on the weather and response efforts, resource allocations and outstanding issues, as well as objectives and forward planning efforts. The Coalition also coordinated with the US Coast Guard to prioritize medical transfer missions during the height of the storm. The Coalition provided 2 members to work in the Coast Guard Command Station and staffed flight medic and nurses for the rescue helicopter.

Requests from hospitals for supplies or support were fielded and filled as resources became available and roadways were deemed passable. A central ambulance staging location was located at NRG Stadium and a helicopter landing zone was established. A secondary staging location was also identified in the East portion of our region as the Beaumont/Orange area fell under the brunt of the storm. Coordination of at risk hospitals and nursing homes was managed by SETRAC. This included identification of available transportation assets and available receiving facility beds in the event evacuation of these facilities were required.

Other activities included support of other jurisdictional public safety answering points. At one point, the City of Houston's 911 center began experiencing an overload of call, and those calls were re-routed through the phone system to SETRAC manned phones.

Over 17 days the CMOC helped coordinate 1544 patient movements, the evacuations of 24 hospitals and 20 nursing homes and 773 health care missions that included patient evacuations, medical transports, and higher level of care transfers. In addition, the coalition coordinated with the Dialysis Network to ensure people trapped in their homes or placed in shelters could receive dialysis. Mass fatality plans were activated and the coalition deployed resources to various jurisdictions and Medical Examiner's offices.

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The most important contributions of the Coalition/CMOC were:

- Provision of health care situational awareness and information sharing across disciplines;
- Resource management, support, and allocation for health care entities and medical field operations;
- Patient transport and transfer coordination to "load balance" patient movement across facilities;
- Coordination with jurisdictional, state, federal, and public sector partners to ensure medical needs were identified and met.
- Coordination of subject matter experts to serve as the regional coordinating entity for the medical component of ESF-8.

DISCUSSION

The 3 devastating storms of the 2017 hurricane season are a poignant reminder that the coordination, collaboration, and integration of health care into the emergency response effort should be a fundamental goal for all health care coalitions. The critical role of SETRAC during Hurricane Harvey response is a successful "test case" of the updated *2017-2022 Health Care Preparedness and Response Capabilities* issued by ASPR's National Healthcare Preparedness Programs in November 2016.[2] These new capabilities move the concept of coalition activities from a focus on preparedness to ensuring that coalitions also possess the ability to respond. Yet, the role of coalitions in response is not a new concept. The *Medical Surge Capacity and Capability Handbook*[3] noted that a health care coalition should be "a response organization that can provide effective actions in a no-notice, sudden onset incident under the most adverse conditions."

The notion that health care coalitions will serve as response entities has been met with some reluctance in certain communities, yet the SETRAC activities are an excellent example of how this can be achieved. The Houston area deluge demonstrated that a strong coalition can coordinate around key issues, chief among these information sharing and the coordination and allocation of health resources. Development of a process that allows for both the gathering of requests for information as well as a procedure that coordinates the assignment of available resources to meet health care delivery needs, based on medical needs and a risk assessment effort, should be a first step taken by health care coalitions seeking to make the transition to response.

The SETRAC coalition's operational structure is based on the existing regional trauma system that functions every day to deliver critical health services. Health care coalitions seeking to transition to response will meet with greater success if their coalition is based on daily delivery of care patterns, rather than simply on geographic borders. The use of existing trauma referral patterns, as was used to develop the Regional Advisory Councils in Texas (and also used as the basis for coalition development in Virginia) should be carefully evaluated and considered.

Neither single hospitals, nor isolated EMS systems or public health agencies, can respond to large-scale disasters like hurricane Harvey, or even to mass-casualty events such as the terrorist shooting in Las Vegas without significant challenge. The active coordination of health care response efforts demonstrated by the SETRAC coalition after hurricane Harvey demonstrates a clear model for other communities to emulate.

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On the Cover

South East Texas Regional Advisory Council (SETRAC) vehicles and equipment prepare to deploy. Photo courtesy of Lori Upton.

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