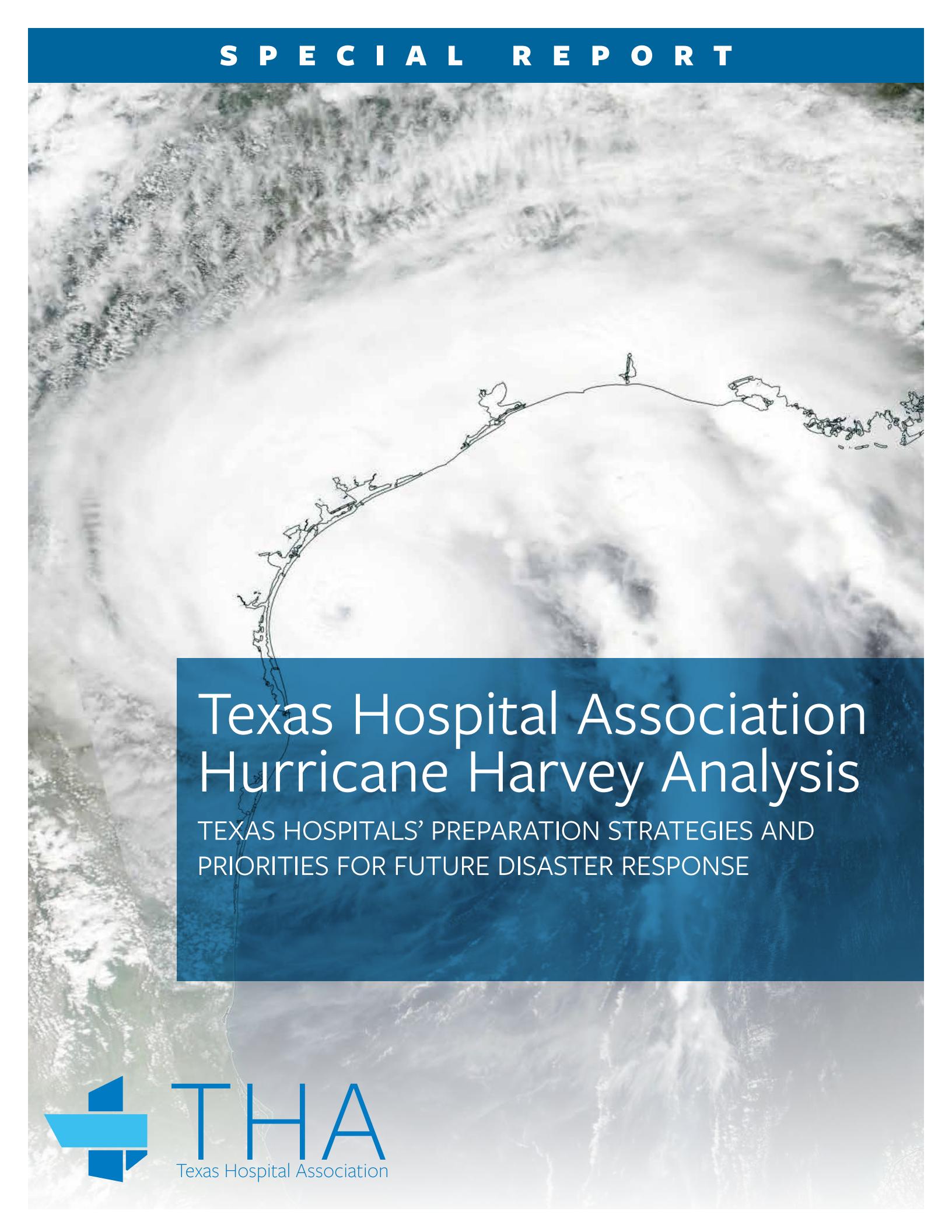


S P E C I A L   R E P O R T



# Texas Hospital Association Hurricane Harvey Analysis

TEXAS HOSPITALS' PREPARATION STRATEGIES AND  
PRIORITIES FOR FUTURE DISASTER RESPONSE



**THA**  
Texas Hospital Association

# Introduction

On Aug. 25, 2017, Hurricane Harvey made landfall between Port Aransas and Port O'Connor as the first Category 4 hurricane to make landfall in the U.S. in 13 years. Over the course of a week, the storm dumped a record-breaking more than 60 inches of rain and forged a path of destruction from Rockport, Texas to Cameron, Louisiana. Responsible for 90 deaths and nearly \$200 billion in damages, Hurricane Harvey is the nation's costliest natural disaster.

Before, during and after the storm, the Texas Hospital Association's goal was to support our hospitals in whatever ways necessary so that they could stay focused on providing lifesaving care. The scope of work ranged from participating in daily briefings with the Federal Emergency Management Agency and the Office of the Assistant Secretary for Preparedness and Response at the U.S. Department of Health and Human Services to shepherding requests for waivers from

a variety of regulatory and legal requirements through the approval process. Despite the storm's epic size and destruction, only 20 hospitals closed or evacuated – a testament to their emergency readiness investment and preparation. Nonetheless, the financial impact and physical damage from the storm, to say nothing of the emotional toll on hospital staff, will be long lasting.

After the storm, THA convened a meeting with hospitals from the Harvey-impacted areas and agency partners to discuss their experiences prior to, during and after the storm with emergency response and recovery. The intention of this document is to identify areas for improvement to better equip hospitals, governmental agencies and other organizations for the next disaster and to delineate specific next steps to take in the improvement process.

# Major Findings and Opportunities for Texas Hospitals to Lead Improvement Initiatives

## 1. Availability and Medical Readiness of Shelter Facilities

Hurricane Harvey was an atypical storm in many respects, not the least of which was the fact that it morphed into such a massive storm in a very short amount of time. Typically, communities and residents have five to seven days to prepare for an impending hurricane. With Harvey, that preparation time was under 50 hours. This short window of time meant that many communities were insufficiently prepared to handle the storm when it hit, and hospitals reported:

- An insufficient number of emergency shelters open and ready to take in evacuees.
- A lack of capacity among the shelters that were open and operational to care for residents with medical challenges, particularly those with quadriplegia, those requiring dialysis and those who were ventilator-dependent or otherwise medically fragile.

Federal law requires that general population shelters be equipped to meet the needs of people with medical conditions and be able to provide dialysis and medical oxygen, for example. The intention is that these individuals not be separated from their communities or be treated differently from other residents.

However, hospitals' experience during Harvey was that people with medical needs were turned away from shelters or that shelters could not handle their medical needs, with that population turning to hospital emergency departments, despite not requiring acute medical attention. This influx of people taxed hospitals' resources, specifically food and linen, and created additional challenges for hospital staff, physicians and security personnel (discussed on page 3).



### Next Step Priorities:

- THA will consider coordinating a meeting with key partners to discuss the process for establishing shelter facilities and ensuring they are prepared to house and care for medically fragile individuals.
- THA will identify existing barriers to supporting medically fragile individuals in shelter facilities and whether changes in policy and or processes are needed.

## 2. Inappropriate Reliance on Hospitals as Shelters and Evacuation Sites

As discussed on page 2, because there were not enough emergency shelters available when Hurricane Harvey made landfall, local residents sought shelter in hospitals, despite not requiring acute medical attention. As the flood waters rose, and the National Guard, local fire departments and Good Samaritans alike rescued people from their cars and homes, hospitals were used as evacuation sites. Hospitals shared dramatic stories of people arriving in dump trucks in groups of 30 or more or being dropped off by Blackhawk helicopters. The influx of people seeking shelter, in addition to hospitals' existing inpatient population, compounded by a shortage of hospital staff, created significant resource challenges for hospitals and burdened the limited number of staff and physicians who were able to get to work.

Hospitals had stockpiled emergency provisions and supplies, but the unexpected large influx of people meant these resources

had to be stretched and rationed. In addition, for hospitals used to having three to four days of "ride out" provisions, Hurricane Harvey presented a unique challenge as the unprecedented amount of rainfall meant that they were inaccessible for five to seven days and unable to replenish dwindling food, drinking water and supplies.



### Next Step Priorities:

- THA will consider coordinating a meeting with key partners to discuss improved communication around appropriate evacuation sites and for related resources to ensure hospitals are not relied on inappropriately in future storms.

## 3. Availability of Adequate Security

The availability of security personnel was a major concern for the hospitals in Harvey-impacted areas. Some hospitals struggled with having enough armed personnel in place, while others that did struggled with housing and feeding sequestered security teams in addition to their existing patients and individuals seeking shelter. Hospitals reported increased costs from the need to have extra security during the storm.

Hospitals reported eruptions of domestic violence amongst some of the individuals who had sought shelter. In addition, as more people relied on the hospital for shelter, and resources were stretched thin, stress and anxiety levels rose, creating tensions and the need for security personnel to maintain an orderly and calm environment.

A hospital in Beaumont that had been closed prior to the storm reported that armed individuals broke into the closed facility to seek shelter. Only after eight hours did state police arrive to disperse these individuals. Other hospitals reported break-ins by individuals seeking pharmaceuticals.

How hospitals typically handle security varies. Some have permanent contracts with local police departments for off-duty officers to provide armed security services within the hospital, while others rely on private security contractors.

Among the hospitals that depend on off-duty police officers, many reported having insufficient security in their facilities during the storm because these officers were recalled by their home

office to provide law enforcement in neighborhoods and communities to enforce curfews, prevent looting and keep the peace. One hospital that reported having enough security did so because it brought in off-duty service officers early and sequestered them in the hospital.

For hospitals relying on private security contractors, some reported being unable to bring enough armed personnel due to delays in getting the contractors through the Texas Department of Public Safety's credentialing process to carry firearms. In addition, as the storm neared, refineries along the Gulf Coast reportedly reserved blocks of private security, creating challenges for hospitals seeking security personnel once the storm hit.

When the hurricane made landfall, one Houston-area hospital had 10 prison inmates in its hospital inpatient census. These inmates were accompanied by prison guards who stepped in to help the hospital with general security when they went off duty.



### Next Step Priorities:

- THA will consider coordinating a meeting with key partners to discuss potential solutions for future storms.

## 4. Timely Delivery of Needed Supplies

The timely replenishing of needed supplies for hospitals always is of vital importance. During a crisis, this need is amplified. Texas hospitals reported that they needed more help getting resources and supplies delivered during the storm and afterwards to replenish exhausted stockpiles. Some hospitals reported that they knew their shipments were sitting in UPS terminals, but because facilities were inaccessible by vehicle due to high water, drivers could not deliver them.



### Next Step Priorities:

- THA will consider a follow-up survey of hospitals to understand the full scope of supplies needed and the circumstances that led to their delivery delays.
- THA also will consider coordinating a meeting with key partners to discuss hospitals' supply needs and ways to ensure their timely delivery.

## 5. Access to Dialysis Services

As discussed earlier, individuals with end stage renal disease who require regular dialysis services (anywhere from three to five times a week) should be able to take shelter in the general population shelters established by local governments. However, hospitals' experiences during Hurricane Harvey were that shelters were not equipped to provide dialysis.

As a result, these patients sought dialysis in hospitals. These patients are not acutely ill but cannot forego this regular treatment. One Houston hospital conducted more than 120 dialysis procedures during the most intense days of the storm. However, the hospital reported an inability to access the patients' medical records or to reach their regular health care providers. The End Stage Renal Disease Network of Texas was not consistently responsive to requests for assistance.

Other dialysis patients stayed in their homes, often becoming stranded for days because of flood waters and getting sicker. Once flood waters receded, these individuals had to seek care at hospitals because their conditions worsened due to lack of dialysis.

Compounding this problem was the closure of many dialysis centers before the storm hit. Federal law requires dialysis facilities to develop emergency preparedness plans, which includes cooperation and collaboration with government officials. However, as outpatient facilities, dialysis centers are not required to have "ride out provisions" and, as such, they do not have the capacity or resources to remain open for 24 hours. According to hospitals,

this problem was identified during Hurricane Ike in 2008 and has yet to be addressed.

For the hospitals that took on the responsibility of providing dialysis services, there were logistical challenges. One was a shortage of dialysate (one of the two required fluids to perform dialysis). The other was the lack of safe water, which is also necessary for dialysis. In one locality, three of the city's water treatment facilities failed, and the hospital had less than an hour notice that the city would switch to reserve water. The hospital sought a decision from the Texas Commission on Environmental Quality on whether its water would be safe for medical purposes, specifically dialysis. However, it took three days for the state agency to issue that decision, and the hospital had to evacuate its 40 dialysis patients.



### Next Step Priorities:

- THA will evaluate the role of dialysis centers in larger emergency plans, determine if a change in federal law is needed to require dialysis to be available in general shelters and examine the possibility of changes to regulations to require dialysis centers to have "ride out" provisions.
- THA will consider engaging with TCEQ to address the issue of timely approval of potable and medically acceptable water sources.

## 6. Communication

In any disaster, clear, timely and consistent communication is of paramount importance. Yet, hospitals reported several challenges during Hurricane Harvey with communication failures. As hospitals endeavored to keep their doors open and the lights

on, some had to make the difficult choice to partially or completely evacuate patients if their facilities were no longer safe for patient care. Although communication among hospitals functioned well through the use of EMResource, communication up

to the state and federal level proved difficult. State and federal officials often could not determine which hospitals were operational and which were evacuating, creating challenges in resource allocation and aid. In addition, media did not always have accurate information about which hospitals were open and closed, which caused confusion.

Another communication breakdown occurred with the military who were brought in to help with evacuations and emergency response. Hospitals reported that military coordinators did not consistently check to see if hospitals were open and accepting patients before dropping off evacuees. In one case, a military helicopter brought evacuees to a hospital, landing on a helipad that was not operational and surrounded by cranes and other heavy construction equipment. In addition, military helicopters reportedly used one radio frequency, while civilians use another, posing additional challenges to communication and safety.

Hospitals also reported frustrations with communicating their needs through the State of Texas Assistance Request (STAR) network, which was established to provide seamless communication between local and state disaster authorities when requests for assistance are submitted. Hospitals reported that the system did not work as intended and that often requests for assistance were submitted and denied with no reason provided. Hospitals also reported a lag time between when the request was submitted and either approved or denied, which in some cases, duplicated response efforts and forced hospitals to search for alternative assistance.

## 7. Effective Use of Volunteers

When the enormity of Hurricane Harvey became known, and news of its epic damage spread across the country, nurses, first responders, mental health professionals and ordinary citizens clamored to volunteer their time, energy and help. Coordinating such a large response can be a challenge, and during Hurricane Harvey, Texas hospitals reported several impediments to using volunteer resources effectively and efficiently.

Although the Texas Department of State Health Services has a volunteer registry for medical professionals, hospitals reported that many out-of-state health care professionals were not able to get their credentials cleared because the registry checks only Texas-based licensing boards. Hospitals themselves still had to manually check medical volunteers' licenses if they were issued by another state. Getting permission to use foreign health care professionals also presented a challenge, even for multi-national hospital systems. Hospitals also requested clarity on the scope of liability protection for volunteer providers.

Managing donations of food, clothing, toys and other items from local businesses and ordinary citizens also created logistical challenges for hospitals.

Information conveyed to the public about curfews did not always include the important fact that hospital employees are considered essential and that they do not have to abide by curfew restrictions if they are going to or from work. Similarly, police departments were inconsistent in their communication to officers about hospital personnel being essential. Some hospitals reported that their staff were denied entrance by police officers, despite having proper identification classifying them as essential personnel. For hospital staff and emergency personnel moving among different hospitals, emergency alert systems that relied on color-based codes created communication challenges. A "code yellow" in one hospital, for example, could mean something different in another hospital. These differences meant that unnecessary time was lost in responding to the emergency.



### Next Step Priorities:

- THA will promote the use of plain language alerts in lieu of color-based emergency codes and expand efforts to encourage all Texas hospitals to adopt plain language. More information is available from <http://www.tha.org/plainlanguagealerts>.
- THA will consider coordinating a meeting with key partners to discuss communications challenges and possible solutions for future storms.



### Next Step Priorities:

- THA will consider coordinating a meeting with key partners to understand the role of the volunteer registry, its limitations and strengths and identify potential improvements and/or alternatives.
- THA will research current laws and regulations governing liability protection for volunteer health care workers to identify potential gaps in protection and any needed statutory or regulatory changes.
- THA will consider coordinating a meeting with key partners to understand how to best communicate the need for donations and methods for donating items.

## 8. Support Services for Hospital Employees, Including Behavioral Health and Emotional Support

As Hurricane Harvey lingered over much of Southeast Texas, hospitals began to see the toll and strain on hospital staff. Many hospital employees rode out the storm in the hospital separated from their families. Others had to juggle family and work responsibilities. Logistically, this created challenges. One hospital opened an in-house day care for the children of employees because schools and daycares remained closed, even after the storm passed. But more profound were the emotional challenges. Hospitals reported needing to engage chaplains and social workers to help their employees manage the stress, anxiety, separation from their families and burnout.



### Next Step Priorities:

- THA will determine what is being done locally and on the part of statewide organizations, such as the Meadows Mental Health Policy Institute, to identify resource gaps and consider what THA's role could be in promoting resources.
- THA will consider meeting with stakeholders, including the local mental health authorities, to learn more about how individuals accessed needed assistance and what might be done in the future to support employees forced to shelter in place and work through a disaster.

## 9. Coordination of Transfers and Fatality Management

During Hurricane Harvey, some particularly vulnerable or medically fragile patients, such as neonates, had to be transferred to hospitals outside of the impacted areas. Hospitals in South Texas, for example, had to transfer patients to hospitals in Dallas and beyond in North Texas where care could best be provided. Coordinating these transfers and minimizing the negative emotional impact on the patients and family members was difficult. Other logistical challenges arose with managing the return transfers of patients who passed away after being evacuated or transferred.

Hospitals also reported difficulties managing fatalities. Some hospitals reported quickly reaching maximum capacity to store deceased individuals. Others reported search-and-rescue workers and regular citizens dropping off deceased individuals without identification or any means of knowing who they were.



### Next Step Priorities:

- The Texas Hospital Association will consider coordinating a meeting with key partners to discuss what occurred during Harvey, how information was communicated, and how improvements might be achieved.
- THA will consider offering educational opportunities to member hospitals highlighting best practices in areas of concern related to the storm, such as fatality management.





## Long-Term Recovery Needs

Recovering and rebuilding after a storm of Harvey's magnitude will take years, and Texas hospitals reported a number of issues that will be essential to attend to even after the immediate impact of the storm fades away.

### Flood Mitigation

One is flood mitigation. After experiencing several flooding events, the Texas Medical Center has done work on flood mitigation. However, there is a continued need for flood mitigation to ensure that hospitals are not forced to close or evacuate patients because they are flooded.

### Emotional and Behavioral Support

Another long-term need is emotional and behavioral support for the community at large. After such a catastrophic event, post-traumatic stress is a real possibility. There likely will be long-term mental health issues, and Texas hospitals emphasized the need to work with school districts to develop tools to help.

### Building Inspector Guidelines

A third long-term need identified by hospitals is the need for guidelines for building inspectors who assess recovery work.

### Public Health Impact

Finally, communication about the long-term public health impact also is essential, with a particular focus needed on potential respiratory issues caused by mold, the Zika threat caused by a growing mosquito population and the need for current immunizations to guard against communicable diseases. To support this work, THA will consider coordinating a meeting with key partners to explore the public health impact of Hurricane Harvey and whether THA could have a role in communicating public health-specific messaging in the coming year, as well as consider the development of communication tools to use in partnership with local public health officials during the next storm.



## Financial Impact

Hurricane Harvey is the nation's costliest natural disaster. Cost estimates of damage to essential infrastructure, including hospitals, are well into the billions of dollars. THA surveyed its members located in the impacted area to get an assessment of Harvey-related costs. Based on the initial response from 92 hospitals, the estimated disaster-related costs for reporting hospitals total \$460 million:

- » \$380 million for capital, operating, emergency work and other costs.
- » \$40 million for increased uncompensated care costs.
- » \$40 million in other increased costs.

In addition to increased costs, hospitals reported revenue and cash flow impacts due to billing and claims filing interruptions and delays, business office closures and reduced hours, insurance and patient payment delays, decreased patient volume and cancelled services.



### Next Step Priorities:

THA will continue:

- Advocating for adequate funding to address disaster-related hospital costs, including an 1115 waiver for an uncompensated care pool specifically related to Harvey-associated costs.
- Advocating for amending the federal Stafford Act to allow investor-owned hospitals to qualify for FEMA public assistance.
- Supporting member hospitals in their applications for FEMA public assistance.



*This November,  
the Texas Hospital Association had the  
honor of distributing more than \$2.2 million to more  
than 5,000 hospital employees affected by Hurricane Harvey in Southeast Texas.*

*We would like to express our deepest gratitude to the hospitals and organizations across Texas and the country that contributed to the THA Hospital Employee Assistance Fund.*

## **From our family to yours, *thank you.***

American Hospital Association  
Greater New York Hospital Association  
California Hospital Association  
Tennessee Hospital Association  
Missouri Hospital Association  
New Jersey Hospital Association  
Iowa Hospital Association  
Louisiana Hospital Association  
Massachusetts Hospital Association  
Mississippi Hospital Association  
Nebraska Hospital Association  
Ohio Hospital Association  
South Carolina Hospital Association Solutions  
Utah Hospital Association  
Maryland Hospital Association  
The Hahn Foundation of the Indiana Hospital Association  
Healthcare Association of New York State  
Idaho Hospital Association  
The Hospital & Health System Association of Pennsylvania  
Arkansas Hospital Association  
Wyoming Hospital Association  
South Dakota Association of Healthcare Organizations  
Georgia Hospital Association  
Washington State Hospital Association  
Colorado Hospital Association  
Minnesota Hospital Association  
New Mexico Hospital Association  
Hospital Association of Rhode Island  
Kentucky Hospital Association  
Michigan Health and Hospital Association  
Hospital Association of Southern California  
Illinois Hospital Association  
Florida Hospital Association  
North Carolina Hospital Association  
Healthcare Association of Hawaii

United Regional Health Care System • Goodall-Witcher Healthcare Foundation  
Moore County Hospital District • Rolling Plains Memorial Hospital  
Hill Country Memorial Hospital • Childress Medical Endowment Foundation  
Hendrick Medical Center • Mitchell County Hospital • Hamilton General Hospital  
Memorial Hermann Health System • Childress Regional Medical Center  
Electra Memorial Hospital • Titus Regional Medical Center  
East Texas Medical Center Regional Healthcare System • Goodall-Witcher Hospital  
Metroplex Adventist Hospital Inc • Parkland Health and Hospital System  
Peterson Regional Medical Center • Rankin County Hospital District  
Yoakum Community Hospital • Coryell Memorial Hospital  
Doctors Hospital at Renaissance • Guadalupe Regional Medical Center  
Cedar Park Regional Medical Center • Houston Methodist Hospital  
Plains Memorial Hospital • South Texas Health System • University Medical Center  
Edinburg Regional Medical Center • Texas Health Resources

Intermountain Healthcare (UT) • University of Utah Hospitals and Clinics (UT)  
Sentara Healthcare (VA) • Sturdy Memorial Foundation Inc (MA)  
Maine Health (ME) • East Alabama Medical Center Cornerstone (AL)  
American Society of Health-Systems Pharmacists (MD) • Health First (FL)  
Catawba Valley Medical Center (NC) • Main Line Health (PA)  
Lake Health Foundation (OH) • Alabama Diversified Health Services LLC (AL)  
Sharp Healthcare Foundation (CA) • Baptist Health Care (FL)  
Communities Foundation of Oklahoma (OK) • The Guthrie Clinic (PA)  
Woman's Hospital (LA) • Holy Family Memorial (WI) • Stormont Vail Health (KS)  
Southern Illinois Chapter For Healthcare Engineering (IL) • 340B Health (DC)  
Franciscan Missionaries of Our Lady Health System (LA) • Concord Hospital (NH)  
Christian Health Care Center (NJ) • Main Line Medical Staff (PA)  
Centrastate Healthcare Foundation (NJ) • Citrus Valley Health Foundation (CA)  
Katherine Shaw Bethea Hospital (IL) • Piggott Community Hospital (AR)  
Carle Foundation (IL) • Henry Ford Allegiance Health (MI)  
Henry County Health Center (IA) • Foothill Presbyterian Hospital (CA)  
Healthcare Resource Group Inc (WA) • North Dakota Hospital Foundation (ND)  
Hancock Regional Hospital Foundation Inc (IN) • Davis County Hospital (IA)  
Stephens Memorial Hospital (ME) • Hunterdon Medical Center (NJ)  
Healthcare Business Media, Inc. (KY) • Kossuth Regional Health Center (IA)  
Carroll County Memorial Hospital (MO) • Copiah County Medical Center (MS)  
Healthcare Council of Western Pennsylvania (PA) • AcuteCare Health System (NJ)  
Clay County Medical Center (KS) • York General (NE) • Fisher-Titus Health (OH)  
Pershing Health System (MO) • Aspirus Medford Hospital & Clinics, Inc (WI)  
Gunnison Valley Hospital (UT) • UHS Delaware Valley Hospital (NY)  
Newton Medical Center (KS) • Nielsen Healthcare Group (MO)  
Clarke County Family Medicine (IA) • Chadron Community Hospital (NE)  
Sabetha Community Hospital (KS) • Burgess Health Center (IA)  
Health Research & Educational Trust (IL) • John T Mather Memorial Hospital (NY)  
Rush Copley Medical Center (IL) • Maricopa Integrated Health System (AZ)  
UnityPoint Health - Des Moines (IA) • Phelps County Regional Medical Center (MO)  
Jennie M Melham Memorial Medical Center (NE)