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## Providing Primary Care to Underserved Children After a Disaster: A National Organization Response

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HUNDREDS OF THOUSANDS of lives in the Gulf Coast region were affected by Hurricane Katrina. The Children's Health Fund (CHF) responded rapidly to the needs of children and their families after the hurricane. CHF is a national organization that supports direct health services, education, and advocacy for medically underserved children. Although CHF's principle mission is the provision of extended primary care services for children and adolescents, the organization is capable of mobilizing rapidly in response to acute medical and public health crises. In fact, the CHF has responded to catastrophic events twice before the Gulf Coast storms of 2005. The first was the 1992 deployment of a mobile medical unit (MMU) to South Florida in the immediate aftermath of category 5 Hurricane Andrew. Then, in 2001 after the terrorist attacks on the World Trade Center in New York City, New York, the CHF deployed 2 MMUs (fully equipped, self-contained "medical offices on wheels") to the triage-and-response efforts at ground zero. Thus, in the aftermath of Hurricane Katrina, within days of the storm's landfall, the CHF was able to deploy MMUs to the Biloxi-Gulfport community in Mississippi and a number of shelter sites for displaced persons in Louisiana.

### AUGUST 30 THROUGH SEPTEMBER 3: 1 TO 5 DAYS AFTER LANDFALL

The CHF developed Operation Assist and began preparations to mobilize medical teams. Developed in response to Hurricane Katrina, Operation Assist is a joint emergency-response initiative of the CHF with the Na-

tional Center for Disaster Preparedness at the Columbia University Mailman School of Public Health (New York, NY). CHF's staff determined necessary staffing, supplies, housing, and safety precautions. Clearance was obtained from the Department of Health in Mississippi and Louisiana for its clinicians not only to provide health care through MMUs but also to access gasoline (in short supply at the time), medical supplies, and pharmaceuticals. In addition, the MMUs were authorized to travel after curfew, which facilitated the provision of health care services for extended hours. Incredibly, MMUs complete with volunteer medical and support staff were sent from 13 of the CHF's 17 existing rural and urban communities across the United States. Arrangements included the very important provision of rotating personnel on a weekly basis to prevent burnout. Staff at CHF's national headquarters in New York City coordinated scheduling, supplies, and resource needs.

Mobile units from the New York Children's Health Project and the CHF program affiliated with the Aaron E.

**Key Words:** Hurricane Katrina, underserved children, disaster preparedness, Children's Health Fund, Operation Assist

**Abbreviations:** CHF, Children's Health Fund; MMU, mobile medical unit

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Henry Community Health Center in Clarksdale, Mississippi departed for Biloxi and Gulfport.

#### **SEPTEMBER 4: 6 DAYS AFTER LANDFALL**

Advance staff arrived in the gulf coast region. The focus was on finding medically underserved populations, which were in serious crisis after the storm and would benefit most from Operation Assist. After selecting appropriate sites, 2 MMUs were dispatched with the first teams of volunteers.

#### **SEPTEMBER 5 (LABOR DAY): 7 DAYS AFTER LANDFALL**

Medical teams arrived on the scene.

*“As we made our way, we were struck by the sight of literally mountains of man-made and natural debris, intertwined and strewn everywhere as if a humungous mixer went on a rampage. The smell of death—dead dogs, dead cats, rotting fish, poultry, and meat and undoubtedly humans—permeated the air. No semblance of infrastructure remained. Power and communications systems were out, no potable water or proper sewage. The transportation system was fractured, and fuel was scarce. Hospitals, health centers, dental offices, and pharmacies were devastated, as were the lives of those personnel that staffed them. Starting from the moment we arrived, we were seeing 75 to 100 patients each day.”*

Alan Shapiro, MD, FAAP

*“We traveled south to Biloxi with the medical team of the Mississippi Children’s Health Project and their MMU. Vast numbers of local residents were without the basics—food, clothing, and shelter. It was apparent that the water supply was unsafe, and bottled water was being brought in by the truckload.”*

Lynn Seim, MSN, RN

#### **SEPTEMBER 6: 8 DAYS AFTER LANDFALL**

Medical teams began providing care to victims. It rapidly became clear that efforts for disaster relief were sorely lacking.

*“The first service delivery site was the Main Street Baptist Church in Biloxi. The medical team from the Mississippi Children’s Health Project quickly (within an hour) set up the MMU and began seeing patients.*

*Any time that we were out in the neighborhoods during the first week, a crowd immediately formed around us, with people vying for our attention, actually touching us, pulling on us to come to listen or see. There was never a moment of concern about personal safety. It was much more a matter of folks needing resources that we might have as well as needing to connect in some meaningful way.”*

Lynn Seim, MSN, RN

Across CHF’s National Network, other projects began preparations to join the effort in the Gulf Coast.

*“Our experiences began with the logistic and planning stage in Phoenix, Arizona, on September 6th. As medical director, I’ve had 5 years experience in mobile medical care delivery as well as wilderness medicine training. Within a 1-day period we had acquired supplies that included over 500 liters of saline, intravenous tubing,*

*antibiotics, acute care medications, infant formula, clothes, diapers, water, and food. Personal supplies included food to sustain the team for 2 weeks, water-purification items to purify over 2000 liters of water, tents, sleeping bags, 60 gallons of gas, an all-terrain vehicle, and a satellite phone. All these supplies were packed in a 4-wheel drive truck and single-axle trailer. Estimated weight was over 2000 lbs.”*

Randal Christensen, MD, FAAP

A CHF team from Phoenix and an MMU from Arkansas arrived in Baton Rouge, Louisiana. Dr Erin Brewer, one of the extraordinary physicians running Louisiana’s emergency medical response effort, first deployed the Operation Assist team to small towns in which large numbers of displaced families from New Orleans, Louisiana, were being sheltered.

#### **SEPTEMBER 7: 9 DAYS AFTER LANDFALL**

As CHF became increasingly involved in medical disaster relief, it was apparent that not only traditional victims but also rescue-and-recovery workers were in need of medical and mental health care.

*“During a lull in hours of meetings, one of the participants began to tell his story of the storm. We had heard he had lost his house and had been working around the clock from 5 days before the storm hit until this point, 9 days after the storm. He told us how slowly everything began to break down at his site—electricity, back-up generators, telephone lines, emergency telephone lines, all other communications. He told us how he passed out his 3 life jackets to others, because he knew how to swim, and placed a marker in his pocket. That reference meant little to me until I learned that he was going to use it to write his social security number on his and his wife’s bodies so they could be identified if they were to die.*

*It was clear to all of us that this gentleman had just gone through an overwhelmingly traumatic experience and was likely exhibiting symptoms of posttraumatic stress disorder, and this was one of the people assigned to rescue others and lead in the recovery.”*

David Krol, MD, MPH, FAAP

#### **SEPTEMBER 8: 10 DAYS AFTER LANDFALL**

*“I met a local councilwoman who appeared exhausted from long hours of work attempting to assess the needs of the community and provide necessary resources. There was no availability of medical services except those of the CHF. The councilwoman asked that I accompany her to a particular house within a nearby housing project. We found 2 children, a girl approximately 9 years old and a boy about 12 years old. They were alone, frightened, and without food, water, or electricity. The temperature was 100 degrees outside. The councilwoman agreed to assume responsibility for the children until family members could care for them.”*

Lynn Seim, MSN, RN

#### **SEPTEMBER 9: 11 DAYS AFTER LANDFALL**

*“As we administered vaccines, applied wound dressings, treated bronchospasm, and learned how to identify cu-*

taneous *V[ibrio] vulnificus* manifestations, we also heard the voices of despair, observed the physical and mental exhaustion, and listened to the stories of loss and dislocation. We were continually struck by the inherent medical needs of these families, which in most instances were best attacked through education and proper application of community resources. We learned of the physical problems associated with crowding in close quarters, improper use and lack of medications, and the difficulty of accessing services in a new area. We learned of the myriad of mental health needs for children and their families in coping with this traumatic event and the trauma associated with family separation, disruption, and global loss.”

Abhay Dandekar, MD, FAAP

#### **SEPTEMBER 10: 12 DAYS AFTER LANDFALL**

“The medical team drove to the Boys and Girls Club, now a relief center, in a small neighborhood in Gulfport. There were easily over 100 residents picking up water, food, and clothing. We were immediately overwhelmed with people who wanted medical attention. Throughout the day we were vaccinating against tetanus, distributing medications, and tending small wounds. This routine was broken by a 9-year-old boy, lacking his usual medications for a behavior disorder, brought in by his mother, complaining that her son was unable to move his left arm or right leg. In fact, his pain was so severe that he refused to raise these extremities voluntarily, and doing so caused visible distress. The physical findings were incompatible with the history of falling from his bed (a mere 2 1/2 feet from the floor). Additional questioning revealed a single mother with 4 children under tremendous stress, having just lost her hope of employment at the casinos. She was now living doubled up and was clearly overwhelmed. Emergency medical services was called, and the child was sent to the emergency department for radiographs, because child abuse was our chief concern. This case alerted us to the unfortunate reality that children often become the secondary victims of stressful circumstances.”

Alan Shapiro, MD, FAAP

#### **SEPTEMBER 11: 13 DAYS AFTER LANDFALL**

As medical teams saw patients at an expanded number of sites, MMUs and their health care teams gained recognition.

“Given our mobility and preparedness, the Louisiana Health Department wanted us to deliver care to ‘region 9.’ This region was 80 miles north of the coast but suffered devastating winds, tornadoes, tree damage, and loss of power. We arrived at the fire station in Angie, a small town in the Washington Parish district. We were told that we were the first medical team to enter the area since the storm. The electricity in the fire station had just been restored, and the road had just been cleared that day. The rest of the town would not have electricity until well after our arrival.

We quickly set up a clinic at the fire station and then helped add staff to a clinic in Pine, Louisiana. During the first 7 days we saw over 300 patients for medical reasons and countless others for supplies. One hundred of these

patients were below the age of 18. Most of the care we provided could have been provided in a primary care doctor’s office. Most families sought care to obtain medications and care of chronic diseases such as asthma, chronic obstructive pulmonary disease, diabetes, and hypertension. The acute care concerns were pneumonias and skin infections.”

Randal Christensen, MD, FAAP

#### **SEPTEMBER 13: 15 DAYS AFTER LANDFALL**

Although delivering primary care is CHF’s goal, pediatricians and other health care providers are called on all too often to see adults and children with serious illness and injury.

“I saw a local police officer for a chief complaint of a bug bite and rash on his neck. When interviewing him, I found that he had just been released from the hospital a few days after the storm with a diagnosis of ‘heart attack.’ When I questioned him about present angina, he replied in the affirmative and then began looking quite ill. I opened the door and called for a nurse and paramedics. We gave him an aspirin and hooked him up to a portable monitor. His color worsened and, ultimately, he became apneic and cardiopulmonary resuscitation was started. It was difficult to determine if he was in pulseless electrical activity or other arrhythmia, given the monitor’s ability. Fortunately for us, he resumed spontaneous respirations within a few minutes. He was transported shortly afterward to the hospital with a presumed diagnosis of mitral infarction with question of pulmonary embolism. That same day we saw a teenaged girl who sustained a cervical fracture. She had fallen off a roof while trying to help her father repair a storm-damaged roof. This kind of secondary trauma in the aftermath of a devastating storm would be all too common.”

Randal Christensen, MD, FAAP

#### **SEPTEMBER 14 AND BEYOND: 16 DAYS AFTER LANDFALL TO PRESENT TIME**

Medical teams from projects in CHF’s national network continue to provide services to Gulf Coast communities in Mississippi and Louisiana. Operation Assist pediatricians were deployed to unusual working environments, hearing and seeing families and children who were surviving under very difficult circumstances.

“One of my most moving experiences was at the FEMA [Federal Emergency Management Agency] trailer site, Renaissance Village, outside of Baton Rouge. There, 527 trailers housed around 2000 hurricane evacuees, about 700 of which were children. I spoke with a young mother who had brought her 4-year-old daughter in for a rash. After diagnosing a nickel allergy, I asked the mother about other illnesses. She told me that her child also had ‘bad asthma.’ I asked how the child was being treated at the FEMA site. She said that when her daughter has an attack, she brings her to the medical tent for a nebulizer treatment by some other volunteer organization. The child was on no daily medications and had never been prescribed an inhaled corticosteroid. As we stood in this huge, dusty, dirt lot, I asked the woman

what she planned to do if her child had an asthma attack at nighttime. Before this, I don't think I've ever seen anyone really shudder; this woman truly shuddered when she considered the question. The medical facility that was present at the site closed and left each day at 4 PM."

Michael Duffy, MD

"At a large shelter in Shreveport, Louisiana, I examined an 8-year-old male with asthma. His mother explained that since having been evacuated to the shelter, the child's asthma had worsened, particularly at nighttime, despite using his regular nebulized medicines. She suspected that the shelter itself was to blame. Indeed, a quick visit to the family's living area in the shelter showed it to be located directly under a large air blower that was blowing cold, unfiltered air directly onto the family while they rested. They had been unable to find another family in the shelter that was willing to trade spots with them. Later that day, with the help of a dedicated Red Cross volunteer, we were able to relocate the family to Arkansas, where they were to be housed with extended family."

Michael Duffy, MD

Vaccines against varicella and hepatitis A and other vaccines were often not available or not offered through federal or state resources. At several times during the first few months of Operation Assist, appeals directly to vaccine manufacturers, particularly Aventis Pasteur, were very successful. The company was able to deliver large quantities of vaccines within 24 to 48 hours to sites in need.

### SUMMARY OF OBSERVATIONS

Locations visited by CHF's MMUs included those typically associated with disasters, such as emergency shelters (both local and distant), tent cities, distribution centers, houses of worship, and community centers. MMUs also went to public housing complexes, campgrounds, and motels—places where displaced victims had quickly become isolated because of the loss of personal and public transportation.

The areas we served suffered from an almost total loss of medical infrastructure. There was an overwhelming loss of hospitals, community and private medical offices, pharmacies, and medical and patient information/insurance systems. The number of uninsured people (now without livelihood) rose significantly, mainly because of the loss of shrimping, fishing, and casino jobs. The predominantly Vietnamese and Hispanic workers in these industries faced additional language and cultural barriers.

Mental health issues comprised some of the most prevalent and least addressed complaints after the hurricane. Mental health is a vital component of comprehensive care and disaster relief. In addition to postdisaster posttraumatic stress disorder in victims and caretakers, preexisting mental disorders often become unveiled after a major catastrophe.

The effects of the hurricane exacerbated many preexisting problems; chronic illnesses such as diabetes, asthma, and neurologic disorders seemed to be common in those who were unable to evacuate. The disruption in their treatment was alarming; most had no access to medications or vital durable medical equipment such as oxygen. Social workers from the CHF determined the accessibility of pharmacies in the areas served, which became an indispensable component of Operation Assist. Many patients were unable to access pharmacies; only a handful of them were open, and policies differed greatly. Patients who had lost everything were often asked to pay for their medicines.

### LESSONS LEARNED

The most poignant lesson was the impact of preexisting deficiencies in the local health care system on the health outcomes of hurricane victims. As CHF saw more patients, it became clear that the region desperately needed a stronger permanent public health infrastructure. There was no effective system for providing essential vaccines or health screening for people who were living in close quarters under emergency shelter conditions.

### CONCLUSIONS

Although the truly emergent relief phase after the catastrophic storm passed relatively quickly, the ravaged communities of coastal Mississippi and Louisiana will have ongoing medical needs long into the future. Two harsh realities face this region: the hurricane and flooding destroyed much of the local health care capacity, and the medical infrastructure was fragile well before the storm, especially for the medically underserved population. To this end, the CHF initiated permanent mobile medical projects in a few affected areas of both states; more of these projects are and will be needed. In all such programs, as is the case throughout the national network of the CHF, the new projects are developed in partnership with local institutions. The Coastal Family Health System in Biloxi-Gulfport, Tulane School of Medicine in New Orleans, and the Louisiana State University School of Medicine are the principle affiliating institutions.

For the clinical and support staff who volunteered to provide health care during the crisis, the images of desperation, hope, and courage will leave an enduring impact. The challenge now for those concerned with the long-term health and well-being of children and families in the aftermath of Katrina is to ensure that a new, stable condition of normalcy is established as quickly as possible. In the meantime, far too many families are living in shelters with uncertain livelihoods, difficult educational challenges, and very uncertain access to appropriate medical care.

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