

## Caregivers and families in medical special needs shelters: An experience during Hurricane Rita

Jessie K. Patton-Levine, BS; Joshua R. Vest, MPH; Adolfo M. Valadez, MD

### Abstract

**Introduction:** Local public health departments may assume responsibility for sheltering and providing care for medically needy populations displaced by disasters. In addition, medical special needs shelters will inevitably house persons not requiring medical assistance. The presence of nonpatients may help or hinder shelter operations. This analysis examines the composition, demographics, and medical requirements of a population in a special needs shelter.

**Methods:** Frequencies and ratios were used to describe persons residing in a medical special needs shelter. All data were obtained from registration records from the city of Austin's medical special needs shelter, established in response to Hurricane Rita in 2005.

**Results:** The medically needy accounted for 58.4 percent of the shelter population. For every 100 patients, the shelter housed 71.2 nonpatients. The most common nonpatients in the shelter were family caregivers (13.1 percent), followed by dependent children (8.0 percent). Most professional caregivers were associated with some type of group facility.

**Conclusions:** Sheltering a medically needy population means caring not only for patients but also for their accompanying caregivers, family, and dependents. Non-medically needy persons utilize shelter capacity and require different resources. Shelter staffing plans should not rely heavily on assistance from accompanying caregivers; instead, they should assume a substantial proportion of shelter capacity will be dedicated to non-medically needy persons.

**Key words:** disaster planning, natural disasters, public health, evacuation, sheltering, mental health

### Introduction

Local public health departments may assume responsibility for sheltering and providing care for medically needy populations displaced by disasters.<sup>1</sup> These persons may include the elderly, persons with mental illness, or those with other serious chronic conditions whose needs exceed the capabilities of general emergency shelters but are not severe enough to require hospitalization.<sup>2</sup> Medical special needs shelters provide continuous nursing/medical care and require specialized personnel, equipment, and supplies. Medical special needs shelter staff also assist with activities of daily living.<sup>1,3,4</sup> However, during an emergency, ensuring an adequate level of patient care through the presence of skilled medical support staff and the availability of medications, equipment, and supplies is difficult.<sup>4-6</sup> Meeting these needs requires knowledge of the size, composition, and medical conditions of the sheltered population. In addition, the medical special needs shelter will also, by necessity, house persons who do not require medical assistance, as professional caregivers, family caregivers, or dependents often accompany medically needy individuals. The presence of non-medically needy individuals may help or hinder shelter operations.

This analysis examined the demographic and health-status composition of a displaced population in a medical special needs shelter. Specifically, the analysis examined the effect of persons without medical needs (i.e., caregivers and family members) on shelter composition and operations. The purpose of this report is to provide information to public health and emergency planners involved in making decisions

on staffing models, resources, and size of medical special needs shelters.

## Methods

In anticipation of Hurricane Rita's landfall, the cities of Galveston and Houston, Texas, issued mandatory evacuation orders, and an estimated 1.1 million people evacuated inland.<sup>7-10</sup> The Austin/Travis County Health and Human Services Department (ATCHHSD) opened medical special needs shelters on September 22, 2005, in two local high schools. Due to inadequate space and in order to capitalize on limited resources, these shelters were closed within 24 hours, and the populations were consolidated into a single medical special needs shelter at the Austin Convention Center.

ATCHHSD, the Community Care Services Department, and the Emergency Medical Services Department provided management, support staff, emergency medical technicians (EMTs), and nurses. The Austin Police Department ensured shelter security and the provision of victim-services counselors for residents. Austin/Travis County Mental Health and Mental Retardation provided counselors and mental healthcare assistants to assist with mental health patients. Medical volunteers, including physicians, nurses, and EMTs, were recruited through many local groups such as the Travis County Medical Society and the Capital Area Medical Reserve Corps. The American Red Cross Central Texas Chapter managed general-population shelters throughout the Austin metro area.

People were admitted to the medical special needs shelter through direct coordination with the Texas Department of State Health Services or were sent from Red Cross general-population shelters in the community. Upon arrival, individuals registered their demographic information via an intake log, and nursing staff collected information on medical conditions and medication needs. Persons from group care facilities were checked in through lists provided by professional caregivers. These lists identified the individual and his or her medical condition and facility of origin. Residents of 15 group care facilities were ultimately housed in the medical special needs shelter.

A total of 601 evacuees were sheltered at the medical special needs shelter during Hurricane Rita. Shelter residents were classified as patients or nonpatients based on chief-complaint information. Nonpatients were further classified as professional caregivers, family caregivers, dependent children (younger than 18 years of age without medical conditions), or other (including some known general-population persons and persons who could not be classified). Professional caregivers were identified through self-report. Family caregivers included any identified family members of known patients who did not have a condition requiring medical assistance. The shelter population was described using frequencies and ratios.

## Results

Table 1 contains demographic information and medical characteristics by resident status for the entire shelter population. The majority of shelter residents (58.4 percent) were patients. A higher percentage of patients were male (54.4 percent), under 65 years of age (45.0 percent), or part of a group care facility (60.7 percent). Nonpatients were younger, with 68.8 percent under age 65, and 8.3 percent of all residents were under the age of 18. The most common medical condition among patients was a diagnosis of mental illness (56.4 percent). Low prevalence levels of diabetes (8.8 percent) and hypertension (7.4 percent) were reported among patients. The percentage of patients requiring assistance with activities of daily living was 4.0 percent, and 4.3 percent were nonambulatory.

Table 2 displays the number of nonpatients and the ratio of nonpatients to patients in the shelter. Overall, for every 100 patients the shelter housed 71.2 nonpatients. The most common nonpatient residents were family caregivers. For every 100 patients, the shelter housed 22.5 family caregivers, excluding children. The shelter housed a surprisingly large number of dependent children (13.7 for every 100 patients). Professional caregivers were the least common nonpatients in the shelter (13.4 per 100 patients). Shelter residents whose classification was unknown or who were identified as members of the general population

**Table 1. Description of persons residing in shelter by patient status**

Characteristic	Patient		Nonpatient		Total	
	n	Percent	n	Percent	n	Percent
Total	351	100.0	250	100.0	601	100.0
Male	191	54.4	121	48.4	312	51.9
Female	153	43.6	126	50.4	279	46.4
Unknown	7	2.0	3	1.2	10	1.7
<b>Age category</b>						
< 18	2	0.6	48	19.2	50	8.3
18 to 64	156	44.4	124	49.6	280	46.6
≥ 65	70	20.0	21	8.4	91	15.1
Unknown	123	35.0	57	22.8	180	30.0
<b>Facility resident</b>						
Yes	213	60.7	56	22.4	269	44.8
No/unknown	138	39.3	194	77.6	332	55.2
<b>Medical conditions</b>						
Diabetes	31	8.8	8	3.2	39	6.5
Hypertension	26	7.4	6	2.4	32	5.3
Mental illness	198	56.4	1	0.4	199	33.1
Respiratory	14	4.0	2	0.8	16	2.6
Recent surgery	4	1.1	0	0.0	4	0.7
Require ADL assistance*	14	4.0	1	0.4	15	2.5
Nonambulatory	15	4.3	0	0.0	15	2.5
* ADL = activities of daily living. <sup>1</sup>						

were grouped as “other” and accounted for 12.6 percent of the shelter population.

Table 3 describes the number of patients per professional caregiver by status as a resident of a group care facility. There were five group care facility patients for every professional caregiver. Conversely, for the population not associated with a group care facility, only one professional caregiver was present for every 34.5 patients. Overall, the shelter housed 7.5 patients for every professional caregiver. In addition, for every one family caregiver there were 1.7 patients.

No family caregivers accompanied the patients from the group care facilities.

### Discussion

During disasters and evacuations, medical special needs shelters provide important services and resources for the medically needy, including shelter, medical care, and accommodations for those with disabilities.<sup>1,11</sup> Patients residing in the medical special needs shelter during Hurricane Rita could not have been safely and appropriately housed in a general-population shelter.

**Table 2. Number and percent of nonpatients in shelter population and ratio of nonpatients to patients by classification**

Classification	Number	Percent of total population (N = 601)	Ratio to total number of patients (n = 351)*
Professional caregiver	47	7.8	13.4
Family caregiver	79	13.1	22.5
Dependent	48	8.0	13.7
Other	76	12.6	21.7
Nonpatient total	250	41.6	71.2

\* Ratio is per 100 patients

Many of those displaced required continual supervision, assistance with activities of daily living, and access to medical services. However, a large proportion of persons residing in the medical special needs shelter did not have such needs.

The presence of nonpatients in the medical special needs shelter has the potential to negatively affect shelter operations and logistics by diverting needed resources away from patients and by creating unanticipated demands for resources. ATCHHSD did not experience this potential negative outcome, for two reasons. First, due to experiences with Hurricane Katrina weeks earlier, more resources than necessary were available and were brought to bear during Hurricane Rita. For example, because of an established system for identifying, credentialing, and scheduling medical professional volunteers as a consequence of response efforts following Hurricane Katrina and a robust response to the call for medical volunteers, sufficient staff were available to care for the medically needy and for general-population shelter residents. In fact, because of the large number of medical volunteers, the low medical-acuity level of the patients, and the large proportion of nonpatients in the medical special needs shelter, an unanticipated issue arose—overstaffing. Second, because of the short time frame of the response (the shelter was open for only four days), the number of nonpatients in the medical special needs shelter was manageable and did not require additional or unplanned-for resources. Overall, medical special needs shelter operations in

Austin were not dramatically affected by the presence of nonpatient residents; however, the convergence of events led to the awkward management situation of not actually needing the number of volunteers who had been recruited and prepared in an attempt to defend against unforeseen problems.

The results of this analysis lead to four relevant planning considerations. First, this relatively small medical special needs shelter population was diverse, and a wide variety of medical conditions existed within the population. Shelters must be prepared to address the diverse needs of those being housed. Second, planned numbers of nursing and medical staff based on gross shelter-bed capacity need to be adjusted to account for the substantial numbers of non-medically needy persons. For example, this analysis demonstrated that staffing plans based on calculations of nurses per total beds would have overstaffed the special needs shelter, given that a sizable proportion of beds were occupied by non-medically needy persons (41.6 percent). Third, shelter plans that rely on assistance from accompanying caregivers must qualify the assumption that such help will be forthcoming. While family caregivers are essential, obviously they will still depend on shelter staff for medical assistance, and they may have other family members, such as children, with whom to be concerned. Furthermore, patients may have no family caregiver present, or the family caregivers could have comorbid medical conditions themselves. Expectations of being able to rely heavily on professional caregivers appear

**Table 3. Number and ratio of patients to professional caregivers by group care facility status**

	Number of patients	Number of professional caregivers	Ratio of patients to professional caregivers*
Facility associated	213	43	5.0
No facility identified	138	4	34.5
Total	351	47	7.5

\* Ratio is per each professional caregiver

unwise, since professional caregivers accounted for a relatively small proportion of the total shelter population (7.8 percent) in our evaluation. In addition, professional caregivers varied by association with group care facility. Group care facilities whose residents arrived en masse maintained a patient-to-staff ratio of five to one. These accompanying professionals cared for multiple patients, which relieved some of the burden from shelter staff. However, these individuals were responsible for the patients of the group care facility and had no obligations to the shelter, limiting their assistance capabilities to specific patients. Similarly, caregivers, whether family or professional, outside of the group care facility population were caring for only one or very few specific patients. These individuals should not be relied on as resources for the entire shelter, since their attention will be limited to these few specific persons. Finally, a substantial proportion of the medical special needs shelter's capacity was dedicated to non-medically needy persons. For every 100 persons the medical special needs shelter was intended to house, an additional 71.2 persons without special medical needs were also present. Some accompanying family members were relatives of professional caregivers rather than of patients. This large number of non-medically needy persons remained at the shelter despite entrance criteria and attempts to limit the number of family members accompanying each patient. This is similar to another Rita evacuation experience in which a medical disaster assistance team reported that 40 percent of a sheltered special needs population required no medical assistance.<sup>12</sup> The

inclusion of a large number of nonpatient residents requires a broad array of services. If the shelter had had to remain open for a longer period of time, temporary housing assistance, temporary employment programs, postal services, and other resources for adults would have been necessary. Childcare, schooling, and entertainment would also have had to be provided for the large number of dependent children housed in the shelter.

### Conclusions

Sheltering a medically needy population means providing not only for patients but also for their accompanying caregivers, relatives, and dependents. Non-medically needy persons utilize shelter capacity and require different resources. The benefit of accompanying caregivers may be minimal. Family members may assist with care; however, the shelter must still provide skilled medical assistance. Professional caregivers may not need the same levels of technical assistance, but they also may not be very numerous. Finally, although all caregivers may help care for persons within the shelter, their attention is likely to be limited to a small number of specific individuals.

The experiences of this particular shelter may not be generalizable to other events or areas of the country; however, the broad experience provides some guidance for policy making and planning. Shelter staffing plans should not rely heavily on assistance from accompanying caregivers, and it should be assumed that a substantial proportion of shelter capacity will be dedicated to nonpatients.

## Acknowledgments

An earlier draft of this analysis was presented at the 2006 National Association of County and City Health Officials Annual Conference. The research was conducted at the Austin/Travis County Health & Human Services Department and received no additional or outside funding.

Jessie K. Patton-Levine, BS, Austin/Travis County Health and Human Services Department, Austin, Texas.

Joshua R. Vest, MPH, Austin/Travis County Health and Human Services Department, Austin, Texas.

Adolfo M. Valadez, MD, Austin/Travis County Health and Human Services Department, Austin, Texas.

## References

1. Abbott D: Disaster public health considerations. *Prehospital Disaster Med.* 2000; 15(4): 158-166.
2. Austin/Travis County Health and Human Services Department: *Special Needs Shelter Plan* (draft). Austin: City of Austin, 2006.
3. Thomas SL, Thomas SD: Displacement and health. *Br Med Bull.* 2004; 69: 115-127.
4. Vogt BM: Issues in nursing home evacuations. *International Journal of Mass Emergency Disasters.* 1991; 9: 247-265.
5. California Emergency Medical Services Authority: *Shelter Medical Group Report: Evacuation, Care, and Sheltering of the Medically Fragile.* Sacramento: California Emergency Medical Services Authority, 2000.
6. Stallings RA: Differential response of hospital personnel to a disaster. *Mass Emergencies.* 1975; 1: 47-54.
7. Office of the Mayor: Mayor Bill White, County Judge Robert Eckels call for voluntary evacuations of flood areas and mobile homes. Press release, September 21, 2005. City of Houston Web site. Available at [www.houstontx.gov/mayor/press/20050921a.html](http://www.houstontx.gov/mayor/press/20050921a.html). Accessed July 10, 2006.
8. Ahlers MM, Jeras J, Lothian D, et al.: With Rita strengthening, Galveston orders evacuation. CNN Web site. Available at [www.cnn.com/2005/WEATHER/09/20/rita/index.html](http://www.cnn.com/2005/WEATHER/09/20/rita/index.html). Accessed July 10, 2006.
9. Connolly C, Moreno S: Texas coast braces for Rita. *Washington Post* Web site. Available at [www.washingtonpost.com/wp-dyn/content/article/2005/09/21/AR2005092100297.html](http://www.washingtonpost.com/wp-dyn/content/article/2005/09/21/AR2005092100297.html). Accessed July 10, 2006.
10. Knabb RD, Brown DP, Rhome JR: *Tropical Cyclone Report: Hurricane Rita 18-26 September 2005.* Miami: National Hurricane Center, 2006.
11. Saliba D, Buchanan J, Kington RS: Function and response of nursing facilities during community disaster. *Am J Public Health.* 2004; 94(8): 1436-1441.
12. Luis R, Theresa C: A disaster medical assistance team operates a hurricane evacuation shelter with U.S. public health service support. *Prev Chronic Dis.* 2006; 3(2): A69.