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A Comparison of the Nursing Home Evacuation Experience between Hurricanes Katrina (2005) and Gustav (2008)

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Abstract

Background—One of the tragic legacies of Hurricane Katrina was the loss of life among Louisiana (LA) nursing home (NH) residents. Katrina revealed a staggering lack of emergency preparation and understanding of how to safely evacuate frail populations. Three years later, LA braced for Hurricane Gustav, a storm heralded to rival Katrina's power. Though its magnitude of destruction ultimately paled to Katrina, the warnings and predicted path preceding Gustav yielded a process of NH evacuations similar to Katrina. The goal of this paper was to ascertain whether NH administrative directors (ADs) felt more prepared to evacuate before Gustav.

Methods—In 2006, Dosa, et. al. (*JAMDA*, 3/07), interviewed 20 NH ADs by qualitative telephone survey to evaluate their lessons learned from Katrina. Administrators at these 20 participating nursing homes were contacted and asked to participate in a follow-up survey to compare hurricane preparedness between 2005 and 2008. Specifically, ADs were asked if they evacuated prior to Gustav, their destination, and about logistical issues with evacuation (e.g., transportation, injuries). ADs were asked to rate their confidence with state assistance, hurricane transportation, and evacuation preparedness on a 10-point scale (10=most confident) and compare their preparedness to Katrina.

Results—Sixteen of the 20 NHs that participated in 2006 agreed to be surveyed – 11 of whom held the same position before Katrina. Unlike Katrina, when only 45% evacuated prior to the storm, all 16 NHs evacuated before Gustav. (56% to another NH and 46% to a church, gym, college, or other facility). Overall, ADs rated their confidence in preparedness for Gustav as a mean of 8.3 (range 5 to 10) – compared with a mean of 5.4 (range 3 to 8) for Katrina, a 54% improvement. Of the 11 ADs employed pre-Katrina, 73% reported improved collaboration with the state and 55% noted improved transportation. Nevertheless, seven ADs noted significant logistical problems during evacuation (mostly transportation); four noted resident injuries (two hip fractures, one traumatic fall, and one cerebrovascular accident); and two noted resident post-traumatic stress.

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Conclusions—NH ADs felt more prepared to evacuate their residents for Gustav, owing partly to improved communication and collaboration with state agencies; however, significant morbidity and logistical problems remain with evacuating frail NH residents before hurricanes.

Keywords

Hurricane Disasters; Emergency Preparedness; Evacuation

INTRODUCTION

One of the enduring legacies of the 2005 hurricane season was the morbidity and mortality consequences among frail, elderly nursing home (NH) residents. The suffering and loss of life among the NH population in the gulf states wrought by Hurricanes Katrina and Rita has been well-documented in high profile media reports.^{1–3} In response to this attention, investigators have begun to evaluate the emergency preparedness needs of NH residents. In August 2006, a report issued by the Office of the Inspector General (OIG) noted many inadequacies with NH emergency preparedness following Hurricane Katrina. In this report, investigators surveyed 20 homes throughout the gulf states, and found that 5 of the 13 sites that evacuated during recent storms encountered significant adverse consequences for the evacuated residents; those that sheltered in place experienced fewer consequences.⁴ Other findings in the OIG report included the stated lack of coordination with state and local officials.

These findings are almost identical to those identified in a separate pilot study conducted for the Kaiser Family Foundation by Dosa and Mor.⁵ In interviews with 20 different Louisiana NHs, investigators identified two general themes that were recurrent during almost every phone interview and a follow-up focus group session – 1) administrators felt abandoned by local, state, and federal emergency preparedness officials, and, 2) administrators identified substantial physical and technical difficulty in evacuating NH residents. A report released by the Agency for Health Care Research and Quality and additional papers published subsequently by others noted similar findings.^{6–10}

Precisely three years and two days after Katrina made landfall, officials in Louisiana, acting on warnings that Gustav could soon become a Category 5 storm to rival Hurricane Katrina, ordered the mandatory evacuation of the city of New Orleans and much of southern Louisiana. By late on the afternoon of August 31, 2008, the evacuation already ranked as the largest in the state's history – a total of 1.9 million Louisianans, including residents at 84 of 115 NHs.¹¹ Mercifully, Gustav struck the Louisiana coast as a Category 2 storm, one that quickly dissipated into a less powerful tropical storm within hours. While Gustav was ultimately responsible for a reported 153 deaths and 4.3 billion dollars in damage in Louisiana alone, the city and region largely escaped the catastrophic consequences that followed Katrina.¹²

Though the scope and destruction of Gustav paled to Katrina, the process for evacuating NH residents unfolded across Louisiana NHs as if Gustav was the second coming of Hurricane Katrina. As such, the overall goal of this project was to ascertain whether the same NH administrators interviewed by Dosa et al. in 2006 as part of a needs assessment of NH emergency preparedness felt that federal, state, and local emergency preparedness had improved over the three years since Katrina.

METHODOLOGY

Sample

Prior to contact, the Institutional Review Board at Brown University reviewed the proposed protocol and deemed it to be exempt from review. Investigators utilized the contact information

for the 20 NHs who participated in the post-Katrina survey. In 2006, the names and telephone numbers of 51 NHs near the Gulf of Mexico were obtained from the Louisiana NH Association (http://www.lnha.org/find_facility.htm). Ultimately, a response rate of 39% was obtained and five of the original 20 administrators agreed to participate in a follow-up focus group. In this follow-up survey, only participants from the original 20 participating NHs were contacted by telephone and asked to participate in a 15 to 20 minute telephone interview. Interview questions were designed to evaluate if hurricane evacuation procedures enacted by administrators differed between Katrina and Gustav. Participants in the follow-up survey were excluded if they were hired after Hurricane Gustav or were not comfortable contrasting their facility's experiences during both hurricanes.

Telephone Survey

A 16-item telephone survey was constructed using the original 2006=5 qualitative survey as a template. Once telephone contact with the participant began, study investigators informed the NH administrators that the survey was voluntary and anonymous. They were told they could decline to answer any question as well as abort the interview at any point during the call.

Investigators confirmed that the NH administrators had served in the same position at the time of Hurricane Gustav. Respondents were asked whether their NH evacuated before Gustav. If so, investigators then asked the administrators who made the ultimate decision to evacuate; how many residents were evacuated; how many days in advance was that decision made; by what mode of transportation were they evacuated; to what type of facility did the NH evacuate residents and for how long they stayed. Administrators were also queried about the consequences of their evacuation, e.g., injuries and/or logistical problems sustained.

If applicable, investigators asked administrators to compare their Gustav evacuation to their Katrina evacuation, specifically in their confidence (1 to 10 scale, 10 being the most confident) in their preparations to evacuate the NH. Administrators were also asked how their collaboration with the state and the evacuation transportation compared for the storms. Finally, administrators were queried about how their residents adjusted – both physically and psychologically – upon their return to the NH. Telephone interviews were conducted between October 2008 and April 2009.

Analysis

All telephone interviews were audiotaped. Data were transcribed and tabulated. Narrative summaries were created for each administrator. A data abstraction tool was created for the telephone interviews and an investigator (G.B.) listened to the interviews twice to ensure accuracy. In addition, transcripts were evaluated by two investigators (G.B. and D.D.) for detailed narrative comments about the consequences of their decision to evacuate and advice administrators had for future evacuations.

RESULTS

A total of 16 of the 20 NHs (80% response rate) that participated in the 2006 survey agreed to participate in this follow-up survey. Of those that declined, one administrator refused to be interviewed, one could not be reached, and two administrators were excluded from the survey because they were hired after Hurricane Gustav and were not significantly knowledgeable to make comparisons between storms. Participating administrators were interviewed from NHs located in the following Louisiana parishes: Jefferson (6), Orleans (2), St Mary (2), and one each from Assumption, St Charles, St James, St John the Baptist, Vermillion, and Acadia. In total, these 16 NH ADs evacuated 1,886 NH residents – 1,558 by bus (82.6%), 258 by ambulance (13.7%), 70 by family (3.7%).

Of the participating administrators, 11 of the 16 NH ADs interviewed had also participated in the 2006 survey. One administrator was promoted from within the facility after Katrina and four administrators were hired shortly after the first storm but felt capable of contrasting their nursing home's experiences during both storms.

Telephone Surveys

Table 1 summarizes the characteristics and consequences of NH evacuations for Hurricanes Katrina and Gustav. Unlike Katrina where only 45% (9 of 20) of NHs evacuated prior to the storm, all 16 NHs (100%) evacuated at least two days prior to Gustav. Nonetheless, most NH administrators felt conflicted in the decision to evacuate. One administrator said, "The second you leave the facility, the clock starts ticking on the quality of care you can give your residents." Their ambivalence was compounded when several of the NHs evacuated directly into Gustav's path based on incorrect initial forecasts.

Three administrators further remarked that they would have preferred sheltering in place but felt more pressure from the state to evacuate in the wake of Katrina, particularly given the devastation to some of the NHs that did not evacuate. One administrator explained, "You don't want to put this many elderly people on the road unless you have to. The state is very jumpy since Katrina and Rita. Ultimately, it falls on our shoulders and if we don't leave and something bad happens [then] we'll get sued ... [But] if you leave too early and the thing doesn't hit [then] you put 70 or 80 people on the road that [sic] don't travel too well and you stick them in traffic for 10 hours ... You can lose them real easily doing that."

Another administrator added, "In hindsight, we definitely would've felt much more comfortable and capable of caring for everybody here at home. But you never know what a hurricane is going to do, for sure. So I guess you're better safe than sorry." One more administrator elaborated, "If you don't evacuate and you have a levee break, you have a terrible consequence ... [so] you have to evacuate. At least you've done something to get your people out of harm's way. And the consequences you face by not doing that could be much worse."

The most common reported concerns with evacuation were morbidity related to the evacuation process (4 of 16, 25%), transportation problems (3 of 16, 19%), and electrical issues at the receiving facility (2 of 16, 13%). Yet, overall, fewer logistical problems occurred during the evacuation for Gustav compared to Katrina (7/16, 44% vs. 10/15, 75%, respectively) and fewer injuries resulted from the evacuation process for Gustav than Katrina (4/16, 25% versus 6/15, 40%, respectively).

Perceived Confidence with Preparedness Efforts

Nine of the 11 administrators (two were excluded because they sheltered in place during Katrina) who participated in both surveys were asked to rate their confidence level (1 to 10, 10 being the most confident) in their home's preparedness for the Gustav evacuation compared to their Katrina/Rita experience. Administrators rated their confidence as a mean of 8.3 (median 8.25; range 5 to 10) for Gustav – compared with a mean of 5.61 (mean 5.0; range 3 to 8) for Katrina, a 54% improvement. One administrator explained, "It was much easier than Katrina because the planning had already been done [starting the day after Katrina]." Another admitted, "We didn't take things as seriously before Katrina devastated us."

Collaboration with State and Local officials

Table 2 illustrates how NH administrators felt their collaboration with the state and their evacuation transportation compared for both storms. Of the 11 administrators interviewed for both surveys, 73% reported improved collaboration with the state. No participant believed their collaboration with the state was worse – a striking contrast to the finding by Dosa, et. al. that

most administrators noted that they received very little assistance in making decisions related to evacuation; indeed, most felt that they were entirely on their own.⁵

One administrator reaffirmed, "It was night and day [between Katrina and Gustav]. Actually, the state is overbearing now. They contact you by email, by phone, trying to see if there's anything you need. They're much better prepared now than they were for Katrina and Rita. There's no comparison."

Overall, 55% of administrators reported improved evacuation transportation while none reported worse transportation accommodations. One administrator echoed, "The main difference between Katrina and Gustav ... was transportation. During Katrina, even if you had a contract, that kind of fell through the cracks because there was such a demand and they couldn't meet the demand. Whereas this time around, even if your Plan A contract transportation buses could not come through, the state was there to assist in any way. They were out there hustling ... trying to get buses for us." Still, problems persisted as three administrators reported transportation problems with evacuating their residents prior to the storm. One administrator said that the facility his NH initially evacuated to was deemed inadequate by state officials shortly after his residents arrived on site. The administrator said he began once again transporting his residents to a second site - only to discover that it was already occupied by another NH's residents. He noted, "We were loading my people up and I didn't know where we were going. I had no place to go [before eventually settling comfortably at a local university]."

Perceived Consequences of Evacuation

Table 3 outlines the perceived consequences of evacuation by administrators. Seven of the 16 administrators (44%) noted physical post-evacuation deconditioning amongst their residents following their return to the NH. Two administrators noted mental health stress post-evacuation as their residents adjusted back to life in the NH. One administrator emphasized, "I can tell you it takes at least six weeks to two months to get a normalcy back into a facility. It's definitely a traumatic experience. We had residents who came back who stopped eating. They did well during the evacuation [but] when we got back they started declining. We had several."

DISCUSSION

This study reveals that administrators perceived improvement in their facilities' ability to evacuate when under hurricane threat three years following Hurricane Katrina. All who were surveyed (16/16) evacuated before Hurricane Gustav made landfall compared to only 45% who left before Katrina. Furthermore, almost every NH evacuated at least three days prior to landfall when Gustav was heralded as a dangerous Category V storm. Belying the impression that evacuations are conducted in a uniform manner was an underlying ambivalence expressed by three administrators for whether evacuation was the right decision. These three administrators implied that they felt external pressure to evacuate - and, if the decision was solely theirs, would have sheltered in place.

At the same time, though, almost every administrator surveyed said they felt more prepared to evacuate their NH for Gustav than Katrina - an overall 54% improvement on a 1 to 10 confidence scale. Many administrators said they started their preparations for the next Katrina the day after returning from their Katrina evacuation - for example, some administrators formulated a plan to evacuate their residents in phases, triaging their home's frailest residents (oxygen- or hemodialysis-dependent) to be evacuated at least a day before the rest of the facility's residents. Fewer injuries and logistical problems occurred during the evacuations preceding Gustav. Moreover, 73 percent of administrators relayed an improvement on the part of the state of Louisiana in its collaboration with individual NHs - especially through improved

communication and resources provided. By their accounts, the overall evacuation process three years later was considerably safer.

Despite improvements, perceived pitfalls remain in evacuating frail, vulnerable elderly. Significant morbidity was encountered, including traumatic falls, two hip fractures, and a cerebrovascular accident, all of which were at least partly attributed by administrators to the evacuation process. ADs noted continued problems with securing suitable transportation and shelters for their residents. Seven ADs noted some physical deconditioning among their residents following evacuation with two specifically mentioning increased psychological stress, depression, and anxiety.

There are several key limitations to our study. In order to use the NH experience as the unit of analysis, the inclusion criteria was limited to the original 20 homes that were contacted by Dosa et al. It is likely that a larger sample size might facilitate a greater understanding of the physiological and psychological ramifications of evacuation. Further work in this area should occur. Secondly, there has been a fair amount of movement of administrators between homes. As such, the sample size for the comparisons was limited to only 11 of the original 20 homes to ensure that administrators had knowledge of their facility's experiences during both storms. Third, with any hurricane there is considerable geographic variability to the affected area and it is possible that some of the answers given by administrators (e.g. collaboration with state/local officials) might have been colored by the experiences of the home during the evacuation. For example, as Cefalu points out in his letter to the editor, some of the nursing homes studied in this evaluation evacuated into the teeth of Hurricane Gustav as parts of the Baton Rouge area were particularly hard hit by the storm.¹³ As such, there is certainly the potential for recall bias.

CONCLUSION

This study is the first of its kind to compare the hurricane preparedness and evacuation experiences of nursing home administrators in the Gulf states between Hurricane Katrina (2005) and Hurricane Gustav (2008). The remarkable similarities of both storms in the days before landfall make comparisons between storms possible. In general, administrators noted marked improvements in many aspects of their ability to respond to hurricane emergencies, including better transportation and shelter for their residents and improved collaboration with state and local officials. These findings are a testament to the work that has been done by public officials, long-term-care trade organizations, and researchers to raise awareness in this previously ignored area. Despite improvements in preparedness, several administrators noted perceived pressure to evacuate from state and local officials and reported physical and mental health consequences of evacuation. Further work to better understand the nature of this perceived pressure and to more concretely determine the consequences of evacuation versus sheltering in place is therefore critical.

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Table 1

Comparing the Evacuation Experience: 2005 versus 2008

	Katrina N=20 (n,%)	Gustav N=16 (n,%)
When did you evacuate?		
Before the Storm	9, 45%	16, 100%
After the Storm	6, 30%	0, 0%
Sheltered in Place	5, 25%	0, 0%
Who made the ultimate decision to evacuate or stay?		
The company/NH owner	7, 35%	4, 25%
NH administrative director	11, 55%	6, 38%
Local or state officials/parish	2, 10%	3, 19%
Collaborative decision	0, 0%	3, 19%
Did not know	1, 5%	0, 0%
When did you decide to evacuate?		
After the storm	6, 40%*	0, 0%
One day prior to the storm	2, 13%*	0, 0%
Two days before the storm	7, 47%*	3, 19%
Three days before the storm	0, 0%*	10, 63%
Four or more days before the storm	0, 0%*	3, 19%
What type of building did you evacuate to?		
Nursing home(s)	6, 40%*	9, 56%
Church	3, 20%*	3, 19%
Hospital	3, 20%*	0, 0%
School gym	3, 20%*	2, 13%
State-run facility	0, 0%*	1, 6%
College/University Dormitory	0, 0%*	1, 6%
Did you encounter any specific logistical problems during the evacuation?		
Yes	10, 67%*	7, 44%
Transportation issues	5, 33%*	3, 19%
Sheltering problems	3, 20%*	4, 25%
Other	2, 13%	0, 0%
No	5, 31%*	9, 56%
Was anyone injured during the evacuation?		
Yes	6, 40%*	4, 25%
Hip fracture following traumatic fall	N/A*	2, 13%
Cerebrovascular accident	N/A*	1, 6%
Traumatic fall requiring hospitalization	N/A*	1, 6%
No	9, 60%*	12, 75%

NH= Nursing Home; N/A= Data not available in transcripts from Katrina survey

* = Incorporates answers from only 15 of the 20 facilities that evacuated before or after the storm in 2005

Table 2

Comparing Collaboration of Nursing Homes with State/Local Agencies (N=11)

	Better	Same	Worse
	(n,%)	(n,%)	(n,%)
How would you compare your level of collaboration with state agencies (better, worse, same)?	8, 73%	3, 27%	0, 0%
How would you compare the transportation afforded to you (better, worse, same)?	6, 55%	5, 45%	0, 0%

Table 3

Perceived Adjustment of Nursing Home Residents Upon Their Return Following Gustav (N=16)

	(n, %)
No difficulties reported	8, 50%
Physical deconditioning	7, 44%
Mental health stress reported	2, 13%
Unable to accurately report	1, 6%