

Experiences of Hurricane Katrina Evacuees in Houston Shelters: Implications for Future Planning

Mollyann Brodie, PhD, Erin Weltzien, Drew Altman, PhD, Robert J. Blendon, PhD, and John M. Benson, MA

Hurricane Katrina made landfall on August 29, 2005, as a category 4 hurricane, causing widespread damage throughout the Gulf Coast region and virtually destroying the city of New Orleans, La. As thousands fled the region, the nation watched painful images of fellow Americans suffering in conditions that more resembled our expectations of disasters in developing countries than what we would expect to see in our own wealthy nation. According to one survey, more than 9 in 10 Americans said they were closely following these media stories during and after the catastrophe.¹

Across the nation, Americans asked ourselves how this could happen and what we could do to help. The public health community also asked what it could do to protect victims' health and promote their recovery and what lessons it could learn to better plan for a future storm or other disaster. We sought to shed light on these issues by describing the results of a survey of evacuees conducted in Houston area shelters 2 weeks after Hurricane Katrina struck, providing a unique view of the experiences of the victims most affected.

Hurricane Katrina was not the first powerful hurricane to strike the United States, nor is it the first time that researchers have asked what lessons can be learned from tragedy. Between 1900 and 2004, the United States mainland has been hit by 3 category 5, 13 category 4, 49 category 3, 41 category 2, and 70 category 1 hurricanes.² Studies focusing on these previous events suggest that, in the case of any given storm, a portion of the population will not evacuate and will require rescue and aid afterward.³⁻⁵ Households are much more likely to evacuate if they trust the source of evacuation information and have clear instructions and options.⁵ Residents of an evacuation area who have family in nearby cities are more likely to evacuate than those who do not,⁶ as are higher income families

Objectives. To shed light on how the public health community can promote the recovery of Hurricane Katrina victims and protect people in future disasters, we examined the experiences of evacuees housed in Houston area shelters 2 weeks after the hurricane.

Methods. A survey was conducted September 10 through 12, 2005, with 680 randomly selected respondents who were evacuated to Houston from the Gulf Coast as a result of Hurricane Katrina. Interviews were conducted in Red Cross shelters in the greater Houston area.

Results. Many evacuees suffered physical and emotional stress during the storm and its aftermath, including going without adequate food and water. In comparison with New Orleans and Louisiana residents overall, disproportionate numbers of this group were African American, had low incomes, and had no health insurance coverage. Many had chronic health conditions and relied heavily on the New Orleans public hospital system, which was destroyed in the storm.

Conclusions. Our results highlight the need for better plans for emergency communication and evacuation of low-income and disabled citizens in future disasters and shed light on choices facing policymakers in planning for the long-term health care needs of vulnerable populations. (*Am J Public Health.* 2006;96:XXX-XXX. doi:10.2105/AJPH.2005.084475)

that have the means to evacuate to hotels.⁴ Conversely, low-income households, minority households (which tend to have lower incomes than White households), and households with elderly or disabled people are less likely to evacuate than other households.⁵

Previous studies have shown that, even when reliable information about probable danger is available, it is difficult to effectively warn large populations that cannot directly perceive the danger associated with a disaster. If a storm warning is at all vague, people will underestimate the threat and be less likely to heed evacuation orders.^{3,7} Also, research has revealed that people who have lived in an area for a short time and may lack experience with hurricanes tend to underestimate the associated danger.^{6,7} In contrast, the longer people have lived in an area, the less likely it is that they will evacuate, in part because they have successfully ridden out past hurricanes.⁵ Some residents may be unwilling to abandon property or possessions.

We asked whether the evacuees of Hurricane Katrina shared these propensities, and

we sought to describe the health status and health care needs of these individuals. In addition, we explored their experiences during the storm and evacuation, looking closely at who did and did not evacuate before the storm, how they perceived the circumstances surrounding their rescue and evacuation, and their plans for the future. The data uncovered raise questions about how to best go forward with policies designed to care for the health needs of these evacuees and offer lessons on how to protect vulnerable populations in future disasters.

METHODS

The survey was jointly designed by the *Washington Post*, the Kaiser Family Foundation, and the Harvard School of Public Health. It was conducted September 10 through 12, 2005, with 680 randomly selected respondents 18 years or older who were evacuated to Houston from the Gulf Coast after Hurricane Katrina. The sample included 439 respondents from the Houston

Reliant Park complex (i.e., the Astrodome and Reliant Center), 152 from the George R. Brown Convention Center, and 12 whose location was not recorded.

The sample also included 77 respondents from 5 of the 14 smaller Red Cross shelters established in the greater Houston area. Interviewers were unable to visit the remaining shelters as a result of privacy concerns, unstable conditions, or inability to contact centers or receive clearance in a timely manner. We have no reason to believe that there were significant differences between residents of the shelters we accessed and residents of the shelters we did not access; however, we cannot rule out this possibility.

Interviews were distributed across shelters in proportion to best estimates of the actual shelter populations, which totaled more than 8000 during the interviewing period. This number represented approximately 30% of the estimated 27100 evacuees residing in the main Houston shelters sites at the peak of occupancy.⁸ About 7 in 10 (69%) respondents reported that they came to Houston as part of the government evacuation effort, and the majority indicated that they had been in Houston for 10 days or less (57%). Few new evacuees were arriving during the interviewing period.⁸

The survey's overall margin of sampling error was ± 4 percentage points. Fieldwork was conducted by International Communications Research (Media, Pa). Interviews were administered face to face by 28 professional, Houston-based interviewers supervised by International Communications Research and staff of the Kaiser Family Foundation. Interviewers explained to respondents that their ability to receive Red Cross aid was not related to their participation in the survey.

Supervisors divided shelters into separate areas that were assigned to an individual interviewer. In the 3 main shelters, areas were monitored from 9 AM to 8 PM. At the 5 smaller shelters, interviewers visited at various times throughout the day to conduct interviews. All interviews were conducted in the most private circumstances available. Respondents were approached and asked verbally to participate. Interviewers explained that responses would be anonymous and that they would not collect names or other personal identifying information. Ninety percent

of the evacuees selected for the survey agreed to participate.

Paper questionnaires were used in conducting the surveys, which were approximately 20 to 25 minutes in duration. Interviewers were instructed to use 2 random selection procedures depending on the mobility of the evacuees in their assigned area. In areas where the evacuees either had limited mobility or were nonmobile (i.e., cot areas and TV lounge areas), interviewers moved through the respondent population and counted off the (randomly generated) n th person to interview. In areas where evacuees were mobile (i.e., hallways and service areas), interviewers remained in one spot, counting off people who passed and selecting the (randomly generated) n th person to interview.

In both cases, these selection criteria were duplicated at the conclusion of each contact attempt, whether the attempt resulted in a completed interview or a refusal to be interviewed. Interviewers excluded children from the counting cycle. Given this sampling plan, families could have been represented by more than one individual; however, considering the number of evacuees present in the shelters, such occurrences would have been rare.

The survey was intended to cover that population hardest hit by the hurricane: those who did not initially evacuate in time, had to rely on government help to evacuate, and did not have access to housing on their own. Clearly, a large number of evacuees were living with friends or family, in temporary paid housing, in hotels, or in other shelters outside Houston. The opinions of these evacuees—generally a more well-off population—were not included in the present survey.

RESULTS

Demographics and Health Characteristics

Nearly all of the evacuees in the Houston shelters were from the New Orleans area, and a large majority had lived in New Orleans their entire lives (Table 1). More than 90% were African American, and approximately 6 in 10 had household incomes below \$20 000 in 2004. About half had been employed full time before the storm.

Compared with New Orleans and Louisiana residents as a whole, disproportionate numbers of the evacuees were African American, had low incomes and low rates of home ownership, had no health insurance coverage, and were at low educational levels. For example, 93% of the residents of the Houston shelters were African American, as compared with 67% of New Orleans residents and 33% of Louisiana residents overall. About one third of evacuees in the Houston shelters reported making less than \$10 000 in 2004, as opposed to just 10% of the general populations of New Orleans and Louisiana. Only 6% of Houston shelter residents had a college degree, compared with more than a quarter of the population of New Orleans and 19% of Louisiana residents.

Nearly half of the shelter residents were single; 30% were married or living as married. Forty-five percent had children younger than 18 years, and 33% had their children with them in the shelter. This group of evacuees was also disproportionately uninsured: 54% had no health insurance before the hurricane, as compared with 26% of Louisiana residents overall. Fewer than 2 in 10 had private health insurance, compared with 63% of Louisiana residents as a whole. Furthermore, 41% of Houston shelter residents reported chronic health conditions such as heart disease, hypertension, diabetes, or asthma.

Before the hurricane, this group of evacuees had relied heavily on the New Orleans public hospital system, a network of hospitals and clinics in and around the city whose flagship institution was Charity Hospital, which was destroyed in the storm. Two thirds of evacuees reported that their main source of health care before the hurricane had been a hospital or clinic (as opposed to a doctor's office), and 62% of these individuals indicated that their primary source of care was the Charity Hospital system (including the city's University Hospital, which was heavily damaged and is now closed).

About half (51%) of the evacuees in the Houston shelters were younger than 65 years and childless and thus, in general, were not eligible for Medicaid. However, the results illustrate that their health status was nearly identical to that of their peers with children, suggesting similarities between the health

TABLE 1—Demographic and Health Characteristics of Houston Shelter Residents, Along With Selective Comparisons With the City of New Orleans and the State of Louisiana

	Houston Shelter Residents (n = 680), %	New Orleans Residents, % ^a	Louisiana Residents, % ^a
Residence at time of hurricane			
New Orleans or outskirts	98		
Elsewhere in Louisiana or Mississippi	1		
Gender			
Female	50	53	52
Male	50	47	48
Race			
White	5	28***	64***
Black	93	67***	33***
Age, y			
18–34	32	28*	32
35–49	37	30***	28***
≥50	30	42***	40***
Marital status			
Married/living as married	30		
Single, never married	47		
Separated/divorced	15		
Widowed	8		
Has children younger than 18 y	45	30	
Has children in shelter	33		
Employment status before storm			
Employed full time	54	40***	37***
Employed part time	15	5***	6***
Unemployed	12	1***	3***
Other (e.g., retired, homemaker)	18	54***	54***
Household income, \$, 2004			
> 10 000	32	10***	10***
10 000–19 999	27	13***	13***
20 000–29 999	15	10***	13
30 000–39 999	9	13***	14***
40 000–49 999	2	9***	10***
≥50 000	1	44***	40***
High school graduate	70	75*	75*
Bachelor's degree	6	26***	19***
Owns home	33	47***	68***
Insurance status among non-elderly			
Uninsured	54		26***
Private insurance	18		63***
Medicare	5		3*
Medicaid or other government program	15		8***
Main source of health care before hurricane			
Hospital	46		
Clinic or health center	20		
Physician's office	20		
No source of care	9		

Continued

care needs of the 2 groups but differences in their ability to obtain care. Approximately 4 in 10 reported that they had a chronic condition (37% with children, 40% without) and that they needed to take prescription medication (38% with children, 42% without). Thirty-three percent of evacuees with children and 29% without children said that they had been injured during the hurricane; 13% in each group reported that their injuries had been serious.

Evacuation Orders and Experiences

Approximately half (49%) of the evacuees in Houston shelters reported that, in the days before the hurricane hit, they had heard the order to evacuate the city and that the order included clear instructions about how to leave (Table 2). Thirty-eight percent reported that they had evacuated ahead of the storm, whereas 61% said they had not. Of those who stayed in New Orleans, approximately one third reported that they had not heard an evacuation order, and about 3 in 10 stated that they had heard an evacuation order but that it had not provided clear information about how to evacuate. Just over one third said that they had received clear information about how to evacuate but had stayed behind.

Those who reported that they heard clear evacuation instructions were more likely to say they had evacuated before the storm (55%) than were those who reported that instructions were not clear (26%) and those who said that they did not hear an evacuation order (16%). When respondents were asked about reasons for not evacuating, lack of transportation and underestimation of the storm were at the top of the list. More than one third (34%) reported lack of a car or other means of evacuating as the main reason, and a somewhat smaller share (28%) said that they did not think that the storm and its aftermath would be as bad as they were. Twelve percent listed being physically unable to leave or having to care for someone who was physically unable to leave as the main reason they stayed behind.

Among those who stayed behind, more than half said that they could have found a way to leave before the storm hit, whereas 42% reported that there would have been no way for them to leave. Economic factors may have

TABLE 1—Continued

Primary care hospital or clinic ^b	
Charity Hospital	54
University Hospital	8
Tulane University Medical Center	5
Touro Infirmary	4
Veterans Administration or US Veterans Medical Center	4
Has chronic health condition	41

Note. In cells with missing values, comparison data were not available. Sample sizes for individual questions vary slightly owing to missing data.

^aData for 2000 derived from the US Census Bureau, Current Population Survey.

^bAmong those who obtained health care primarily from a hospital or clinic.

* $P < .05$; *** $P < .001$ (vs Houston shelter residents).

played a role in determining who stayed and who left, in that 39% of those who said that they could not have found a way to leave reported earning less than \$10 000 in the previous year, as compared with 29% of those who said they could have found a way to leave.

There were few demographic differences between the Houston shelter residents who said they evacuated their homes before the storm and those who did not; among other characteristics, they were similar in terms of age, income, race, and education. However, native residents of New Orleans appear to have been less likely to leave: 77% of those who reported that they did not evacuate before Katrina hit had lived in New Orleans their entire lives, as compared with 67% of residents who evacuated ahead of the storm.

Experiences in the Immediate Aftermath of Storm

In the immediate aftermath of the storm, more than one third of the evacuees in Houston shelters reported that they had spent time in the Superdome in New Orleans, and 7% said that they had spent time in the New Orleans Convention Center (Table 3), 2 sites that gained widespread attention for their dismal conditions in the days after the storm. Forty percent of these evacuees said that they had spent at least a day living on a street or overpass waiting to be rescued, and 34% reported that they had been trapped in their homes. Half of those who had been trapped said they had waited 3 or more days to be rescued.

Many shelter residents reported stressful conditions in the days after Hurricane Katrina.

More than half reported not having had enough food or fresh water, about one third did not have the prescription medicines they needed, and one quarter needed medical care and could not obtain it. Twenty-two percent reported having been threatened with violence. More than one third (34%) of evacuees who had spent time in either the Superdome or the New Orleans Convention Center said that they had been threatened with violence, as compared with 14% of evacuees who had not spent time in those facilities.

About one third of the evacuees in the Houston shelters reported experiencing health problems or injuries as a result of the hurricane, including 13% who said that these problems were serious. In addition, 14% said that family members, neighbors, or close friends had been killed during the storm and its aftermath. Thirteen percent said that, at the time of the survey, an immediate family member was still missing, and nearly one third reported that a close relative or friend was still missing. In comparison with those who evacuated ahead of the storm, those who did not reported that they experienced more problems as a result of the storm; for example, more reported going without food (60% vs 47%), water (59% vs 45%), and medicine (37% vs 25%), and more said that they had suffered injuries (37% vs 26%).

Evaluations of the Emergency Response

Forty-three percent of evacuees who had been trapped in their homes reported that they had eventually been rescued by the Coast Guard, National Guard, or the military (Table 4). However, a similar share said that

they had been rescued by friends or neighbors or that they rescued themselves. Fewer than 1 in 10 said that they had been rescued by police or firefighters.

Overall, when asked which organizations had helped them the most during the flood, one quarter of evacuees listed the National Guard, Coast Guard, or military, whereas 19% mentioned private organizations such as the Red Cross. Eleven percent reported that federal agencies such as the Federal Emergency Management Agency or the Department of Homeland Security had provided the most help. The largest share of respondents, nearly 4 in 10, reported that none of these organizations had helped them.

When asked to rate the government's response to the hurricane from a list of options, 76% of the evacuees agreed that the response "was too slow, and there's no excuse," whereas 17% agreed that the time required for the government to respond "was reasonable under the circumstances." Nearly 7 in 10 said that they believed the government would have responded more quickly if the affected areas had been populated by a higher percentage of wealthy, White residents, as opposed to the higher population of poor, Black residents. Twenty-three percent of the respondents did not believe that race and poverty had any effect on the speed of the rescue effort. Sixty-one percent reported that their experiences during Hurricane Katrina and the aftermath made them feel as though the government did not care about people like them.

A majority of evacuees at the Houston shelters disapproved of the job political leaders at all 3 levels of government (federal, state, and city) did in handling the situation caused by Hurricane Katrina. Fifteen percent approved of the job done by President Bush, whereas 70% disapproved. Approval ratings were slightly higher for Governor Blanco and Mayor Nagin, but again the majority of the respondents expressed disapproval.

Current Resources and Plans for the Future

Many of the residents of these Houston shelters lacked important resources that could have helped them recover. Only 20% reported that they had relatives or friends with whom they could move in temporarily, and

TABLE 2—Houston Shelter Residents' Reports of Evacuation Orders and Their Own Evacuation Experiences

	All Residents (n = 680), %	Evacuated Before the Storm (n = 255), %	Evacuated After the Storm (n = 408), %
Evacuated			
Yes	38	100	
No	61		100
Awareness of evacuation order			
Heard order and said it gave clear instructions	49	71	36***
Heard order and said it did not give clear instructions	24	17	28***
Did not hear evacuation order	26	11	35***
Primary reason for not evacuating			
Did not have a car or a way to leave			34
Thought the storm and aftermath would not be as bad as they were			28
Had to care for someone who was physically unable to leave			7
Physically unable to leave			5
Waited too long			7
Worried that possessions would be stolen/damaged			4
Did not want to leave pet			1
Just did not want to leave			10
None of the above			3
Could have found a way to leave before the storm hit			
Yes			56
No			42
Primary source of news about the evacuation order ^a			
Television	79	84	77*
Radio	13	10	14
Friend/family member	4	3	5
Police	1	2	1
Time lived in New Orleans, y ^b			
≤ 10	8	9	6
11–20	7	8	6
> 20	12	15	10
Entire life	73	67	77**

Note. In cells with missing values, comparison data were not available. Sample sizes for individual questions vary slightly owing to missing data.

^aAmong those who heard an evacuation order

^bAmong residents of greater New Orleans.

* $P < .05$; ** $P < .01$; *** $P < .001$ (vs those who evacuated before the storm).

TABLE 3—Experiences of Houston Shelter Residents in the Immediate Aftermath of the Storm

	Residents (n = 680), %
Spent time inside the New Orleans Superdome	35
Spent time inside the New Orleans Convention Center	7
Spent at least 1 day living on a street or overpass	40
Trapped in home and had to be rescued	34
No. of days trapped in home ^a	
< 1	6
1	16
2	28
≥ 3	50
Went without adequate food	56
Went without adequate water	54
Went without prescription medicines	32
Threatened with violence	22
Went without medical care	25
Current status of immediate family	
All together in this shelter	45
Separated, but know of whereabouts	40
Still missing	13
Current status of other close relatives and friends	
Still missing	32
All accounted for	57
Do not know	10
Health problems or injuries as a result of hurricane	
Yes, serious	13
Yes, not serious	19
No	66
Family, neighbors, or close friends killed during the storm and flooding	
Yes	14
No	54
Do not know	31

Note. Sample sizes for individual questions vary slightly owing to missing data.

^aAmong the 34% who were trapped in their homes.

approximately 3 in 10 reported having a bank account from which they could withdraw money (31%) or having usable credit cards (28%).

Most of the evacuees reported not having a home to return to; the vast majority said that their homes had been either completely destroyed (55%) or seriously damaged

(29%). Seventy-two percent said that they had no insurance to cover their losses. Although 43% reported that they eventually wanted to go back to their hometowns, nearly the same percentage (42%) indicated that they wanted to permanently relocate somewhere else. Of those who planned to relocate, almost two thirds said that they

wanted to stay in the Houston area. There were few differences in income, employment status before the storm, health status, or health insurance coverage between evacuees who wanted to return and those who planned to relocate.

TABLE 4—Houston Shelter Residents’ Evaluations of the Emergency Response and Plans for the Future

	Residents (n = 680), %
Who eventually rescued you? ^a	
Coast Guard, National Guard, or military	43
Friends or neighbors	26
Rescued yourself	13
Police or firefighters	9
Who helped the most during the flood and evacuation?	
National Guard, Coast Guard, or military	25
Private organization (e.g., Red Cross, Salvation Army)	19
Federal agency (e.g., Department of Homeland Security, Federal Emergency Management Agency)	11
New Orleans police/fire department/ other city agency	4
State police or other state agency	3
None of the above	39
Views of government response to the hurricane and flooding	
Too slow and there is no excuse	76
Reasonable under circumstances	17
Experience made you feel like government cares about people similar to yourself	
No	61
Yes	28
Would government have responded more quickly if more residents had been wealthy and White?	
Yes	68
No	23
Rating of President Bush’s handling of situation	
Disapprove	70
Approve	15
Rating of Governor Blanco’s handling of situation	
Disapprove	58
Approve	27
Rating of Mayor Ray Nagin’s handling of situation	
Disapprove	53
Approve	33
Current status of home	
Completely destroyed	55
Seriously damaged but not destroyed	29
Not seriously damaged	4
Do not know	11

Continued

TABLE 4—Continued

Where are you planning to go?	
Move back to hometown	43
Relocate to Houston	29
Relocate elsewhere in Texas	6
Relocate somewhere else	7
Do not know	15
Do you have insurance to cover losses?	
Yes, insurance to cover most of losses	10
Yes, insurance to cover some of losses	14
No insurance	72
Have a bank account to withdraw money	31
Have family or friends to move in with temporarily	20
Have usable credit cards	28
Hurricane brought out:	
Best in people	28
Worst in people	28
Both (volunteered)	38
Do you think you will ever fully recover from the hurricane?	
Yes	53
No	38

Note. Sample sizes for individual questions vary slightly owing to missing data.

^aAmong those who were trapped in their home.

Despite devastating losses, more than half (53%) of the residents of these Houston shelters said that they expect to fully recover from the hurricane, whereas nearly 4 in 10 (38%) believed that they would never fully recover. Evacuees who expected to recover were in better health (i.e., they were less likely to have a chronic condition and less likely to have suffered an injury in the storm) and better off financially (in terms of income, education, and the necessary insurance coverage to cover losses), and they had experienced fewer problems during the storm.

The results presented here are similar to those found in a CNN/Gallup/*USA Today* survey conducted a month after Hurricane Katrina.⁹ Fifteen percent of New Orleans area respondents reported that they did not know where some of their family members were, a percentage similar to that found here (Table 3). Similar to the data described here (Table 4), half said that they would return, whereas 39% said that they would not; 5% reported that they had already returned.

DISCUSSION

Our results make clear the situation facing victims of Hurricane Katrina and confirm the trends revealed in previous disasters. We found that those who did not evacuate lacked transportation, misjudged the storm, were limited by their own or a family member’s physical disability, and were more likely to be lifetime New Orleans residents.

The present survey illuminates the challenges of effectively evacuating cities’ most at-risk residents during a disaster and providing for the long-term health needs of vulnerable populations in the aftermath. Also, our results shed light on critical policy choices facing public health officials and policymakers in the Gulf Coast region and across the nation.

Implications for Disaster Planners

These results point to the importance of investigating why the response to Hurricane Katrina was so slow. The lives of those remaining in the city depended on the rapid deployment of search and rescue teams in helicopters and boats, the arrival of emergency medical service personnel, and adequate supplies of clean water and food. Despite preexisting plans, many personnel and resources did not arrive within the first week after the hurricane, resulting in a great deal of tragedy. The factors behind this failure to respond adequately need to be identified to prevent future failures.

Our results also show that better emergency communication plans need to be developed for urban evacuation situations. Residents, particularly those of low-income areas, need more explicit information on how to find safety or evacuate if they have no car, financial resources, or place to stay outside the city or if someone else in their family is physically disabled. The credibility of officials providing such information is likely to be important in determining whether their advice and directions are heeded.

Examination of the present results from the Red Cross shelters shows that, in comparison with evacuees from higher income households, those from low-income households were less likely to own a car, to have enough money to pay for alternative transportation, or to have a place to stay once they left the city. To save the lives of lower income, elderly, or

disabled residents, public officials need to have trucks and buses available to move through low-income neighborhoods and neighborhoods with elderly housing to take people to safety.

It is unlikely, however, that we can completely evacuate entire cities; as we saw just a few weeks later in the case of Hurricane Rita, many Houston residents were unable to evacuate as a result of freeway gridlock. Thus, we must ensure that we can supply food, water, and medicine to people who are trapped. Cities need to have designated facilities to house people during long storms or floods and have emergency supplies that can be brought to them. This is important given the national debate about whether or not our military should be more directly involved in relief efforts resulting from national disasters. The present survey shows that the Coast Guard stands among the institutions named as most helpful in rescuing evacuees. Looking forward, perhaps one of the biggest questions to address—albeit one involving complicated constitutional and historical issues—is the role of the military in domestic rescue efforts.

Implications for Health Care

The circumstances uncovered in this survey also point to health challenges facing poor, largely uninsured populations after massive dislocation. Our data portray an evacuee population struggling with a combination of poverty and health care needs, and they suggest clearly the necessity of providing short-term public insurance coverage for those without coverage or access to the public hospitals on which they typically depend.

One element of the discussion about how to extend Medicaid benefits to hurricane victims revolves around whether exclusion of childless adults from eligibility for Medicaid should be waived and whether Medicaid assistance should be provided as a uniform federal response or separate state-by-state waivers. For Gulf Coast victims, the response to this issue will determine how many uninsured individuals are able to obtain health care coverage. One argument for broadening eligibility is that evacuees—whether they meet current categorical eligibility requirements or not—have similar health needs. We see in our data that those evacuees without children

were as likely as those with children to report having chronic conditions, needing prescription drugs on a daily basis, and facing serious health issues as a result of the hurricane.

Katrina also illustrates who the uninsured are in America today and how they obtain their care. For the most part, the evacuees were lower-income, working Americans largely dependent on safety net clinics and hospitals. (The evacuees were similar to the overall uninsured population in America today except that they were more likely to be African American than White.) Their health experiences point to the difference between having insurance and relying on a safety net institution for their health care needs.

Because so many relied on Charity Hospital as their primary source of health care, our results underscore the vital role it played in the lives of evacuees before Katrina. Louisiana, with limited resources and a limited Medicaid program, has historically relied on public institutions such as Charity Hospital to serve as the safety net for many of its residents. With Charity hospital destroyed, so were the medical records and any hope of continuity of health care for these individuals. In contrast, individuals who have health insurance coverage at the time of a crisis can access care more easily in another setting or location. Moving forward, any Katrina reconstruction and rebuilding plan needs a safety net system designed to ensure that those who are most vulnerable are able to obtain health care. ■

About the Authors

Mollyann Brodie, Drew Altman, and Erin Weltzien are with the Henry J. Kaiser Family Foundation, Menlo Park, Calif. Robert J. Blendon and John M. Benson are with the Harvard School of Public Health, Boston, Mass.

Requests for reprints should be sent to Mollyann Brodie, PhD, Henry J. Kaiser Family Foundation, 2400 Sand Hill Rd, Menlo Park, CA 94025 (e-mail: mbrodie@kff.org).

This article was accepted December 23, 2005.

Contributors

M. Brodie codesigned and directed the study, supervised all aspects of its implementation and analysis, and contributed to the writing and editing of the article. D. Altman co-designed the study and contributed to interpretations and conclusions. E. Weltzien supervised the study's data collection and led the analysis and writing. B.J. Blendon assisted with the design of the study and contributed to the interpretations and conclusions. J.M. Benson assisted with the study and the editing of the article.

Acknowledgments

The survey described here was financially supported by the Henry J. Kaiser Family Foundation and the *Washington Post*.

This project would not have been possible without the contributions of Rich Morin and Claudia Deane of the *Washington Post*, who first conceived of the survey and reported on the survey in the *Washington Post*; Melissa Hermann and Jennifer Schmidt of International Communications Research, who handled sampling and fieldwork concerns; Lori Robbins of International Communications Research, who oversaw sampling in Houston; Lisa Rein of the *Washington Post*, who reported on the survey in the *Washington Post*, provided critical support as a liaison with the Red Cross and other authorities in Houston; and Diane Rowland of the Kaiser Family Foundation, who provided helpful comments on the article.

Note. Administrators from the Red Cross, the city of Houston, and the Reliant Park complex granted us permission to conduct interviews at the various centers, but these entities were not co-sponsors of the survey and bear no responsibility for the results presented.

Human Participant Protection

The survey instrument and survey design were approved by the human subjects committee at the Harvard School of Public Health. Respondents were asked verbally to participate, and interviewers explained that their responses would be anonymous.

References

1. Kaiser Family Foundation/Harvard School of Public Health. Kaiser health poll report. Available at: <http://www.kff.org/kaiserpolls/7424.cfm>. Accessed October 28, 2005.
2. National Weather Service, National Hurricane Center, Tropical Prediction Center. U.S. hurricane strikes by decade. Available at: <http://www.nhc.noaa.gov/pastdec.shtml>. Accessed December 1, 2005.
3. Auf der Heide E. Common misconceptions about disasters: panic, the "disaster syndrome," and looting. In: O'Leary M, ed. *The First 72 Hours: A Community Approach to Disaster Preparedness*. Lincoln, Neb: iUniverse Publishing; 2004:340–380.
4. Bates FL. *The Social and Psychological Consequences of a Natural Disaster: A Longitudinal Study of Hurricane Audrey*. Washington, DC: National Academy Press; 1963.
5. Gladwin H, Peacock WG. Warning and evacuation: a night for hard houses. In: Peacock WG, Morrow BH, Gladwin H, eds. *Hurricane Andrew: Ethnicity, Gender and the Sociology of Disasters*. London, England: Routledge; 1997:52–74.
6. Drabek TE, Boggs KS. Families in disaster: reactions and relatives. *J Marriage Fam*. 1968;30:443–451.
7. Fritz CE, Williams HB. The human being in disasters: a research perspective. *Ann Am Acad Political Soc Sci*. 1957;309:42–51.
8. Harris County Joint Information Center. Hurricane Katrina relief effort. Available at: <http://www.hcjc.org>. Accessed December 2, 2005.
9. *Gallup/CNN/USA Today Poll*. Storrs, Conn: Roper Center for Public Opinion Research; 2005:7