EVACUATION STUDY for People with Disabilities

Disasters, Evacuations and Persons with Disabilities

An Assessment of Key Issues Facing Individuals and Households

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Research support provided by the National Institute on Disability and Rehabilitation Research, Disability Rehabilitation Research Projects, U.S. Department of Education

April 2010

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EXECUTIVE SUMMARY

The recent report from the National Council on Disability cites a "clear lack of research validating best practices" and "a lack of evidenced-based knowledge about how best to organize preparedness, response, and recovery efforts" for persons with disabilities (NCD 2009:14). Unfortunately, the substance of this critique endures despite repeated disasters and on-going pleas to address emergency preparedness challenges for persons who are most vulnerable to disaster, particularly those living with disabilities (Bascetta 2006; Bloodworth et al. 2007; Byzek & Gilmer 2001; Davis & Mincin 2005; DHS 2005; NCD 2006; NOD 2009).

Disasters such as the 1993 World Trade Center bombing and the attack on the World Trade Centers of 9/11 called into question previously held "wait-for-help" practices for evacuating persons with mobility impairments. Hurricanes Katrina and Rita in 2005 imprinted on the American consciousness the price that persons with disabilities pay when emergency and evacuation efforts do not sufficiently address their needs. Yet, even with so much attention on disability and disaster over the last decade, with few exceptions we remain without much generalizable findings or evidence-based practices of what works for persons with disabilities in disaster (cf. Byzek & Gilmer 2001; Dosa et al. 2007; Fischer et al. 1995; Juillet 1993; NOD 2005; White et al. 2007). This report is one effort in a larger project designed to produce such generalizable findings that can be used to improve disaster evacuation planning for persons with disabilities in communities across the U.S.

The United States Department of Education's National Institute on Disability Rehabilitation and Research (NIDRR) has made a research award to a team of investigators from Louisiana State University (LSU), Inclusion Research Institute Inclusive Preparedness Center (IRI/IPC) and West Virginia University (WVU). This report represents the first research effort as part of this project.

The goal of the overall project is to improve future planning and preparedness activities by governmental and non-governmental organizations that provide assistance to persons with disabilities and their households during emergency and disaster evacuations. This goal is accomplished through systematic assessment of the needs, behaviors, and attitudes of persons with disabilities and their households across conditions of hazard types, varied levels of hazard vulnerabilities, past experiences, and other relevant community conditions. The overall project can be summarized as having three core elements:

(1) Research Component:
- Individual-level data collection with persons with disabilities and their households
- Organization-level data collection with disability service providers, emergency management and responders

(2) Applications Component:
- Evidence-based best practices documentation
- Community & organizational assessment reporting

(3) Training and Exercise Evaluation Component:
- Exercise development, testing, and evaluation reporting
- Training materials development

This report presents a comprehensive review of findings from the individual household-level data collection portion of the project's first research component.

The research findings contained in this report are based on 1162 telephone and mail-in survey interviews with persons with disabilities and their household members in seven states known to have had mass scale evacuation in the recent past. The survey work was conducted in four successive samples of distinctive groups relevant to the larger disability community beginning in the summer of 2008 and completed in December of that year. A telephone survey of elderly adults living at home was performed using traditional random sampling (random digit dial) techniques in the target study areas. For the next sub-group samples, participants were contacted through a variety of organizations that serve and support persons with disabilities. Participating organizations included Centers for Independent Living that serve persons with various kinds of disabilities, Medicaid state agencies that supervise physical disability and mental retardation/developmental disability (MR/DD) Medicaid 1915 (c) home- and community-based services waivers, Arcs for persons who have cognitive disabilities, and deaf and hard of hearing organizations.

To respect respondent confidentiality under HIPAA, contact lists of clients or customers of these organizations were not available to the researchers to serve as a sample frame for each subgroup. As a result, the approach adopted was as follows: participating organizations were given a batch of survey instruments and were given instructions of how to randomize selection of respondents within designated geographic areas (designated by ZIP codes). Those organizations then mailed survey invitation letters to either a random selection or total population of clients who lived in each of the targeted areas. Individuals with disabilities or a member of their household then contacted researchers, completing the survey either via a toll-free hotline or by mailing the survey. Participants received a small financial incentive (a $10 retail gift certificate card) for completing the survey.

Research included locations across the country known to have large-scale evacuations in the past several years. In order to obtain persons with evacuation experience, the sample proceeded by selecting evacuation "higher risk" areas: those areas that have had at least one recent evacuation event in last three or four years. These geographic areas were paired with "relatively lower risk" areas: those areas somewhat less prone to evacuation incidents – based on historical hazards loss information and prior official disaster declarations. These comparison areas contain potential hazard vulnerabilities but have not had a recent evacuation event (in the last three or four years). The reason for this approach is to be able to compare behavior, perceptions and preparedness related to disasters in order to maximize the generalizability of the findings and to be able to provide evidence-based suggestions to key organizations that may be involved in large-scale future evacuations with persons with disabilities.

The study areas selected included San Bernardino and San Diego Counties in California; Collier and Jackson counties in Florida; New Orleans and Terrebonne Parishes in Louisiana; St. Louis, St. Charles and Lincoln County in Missouri; the city of Apex, North Carolina; Logan County, West Virginia; and Jefferson and Tarrant Counties in Texas. Large scale disasters and evacuation events targeted included wild fires in San Diego County, California (October 2007); a toxic spill in Apex, North Carolina (October 2006); flooding in the St. Louis area in Missouri (March 2008) and several southern West Virginia counties (May 2009); hurricanes and flooding in Collier County, Florida (2004 and 2005), Orleans Parish, Louisiana (2005) and Jefferson County, Texas (2005).

The following details some of the main findings from this study:

Study Participants

- A total of 1162 persons with disabilities and their household members completed the survey, many of them with multiple disabling conditions, including: medical impairments (n=425), mobility impairments (n=334), hearing impairments (n=168), mental health impairments (n=137), cognitive impairments (n=127), visual impairments (n=127), and other impairments (n=134). In total, 42% of respondents reported a disability and 16% of respondents were members of a household that included a person with a disability, the remainder were persons who were elderly who did not identify as having a disability.
- Study participants included 58% of persons living in a community where a recent disaster occurred in the last several years, while 42% of respondents lived in an area where a major disaster has not occurred in the last several years.
- The study targeted a range of hazard types, including: hurricane (56%), flood (19%), wildfire (16%) and chemical (9%). Study participants were from seven states recently impacted by large-scale evacuation and disaster including: California (16%), Florida (16%), Louisiana (17%), Missouri (11%), North Carolina (9%), Texas (23%) and West Virginia (8%).
- A total of 670 respondents (57.7%) out of 1162 indicated that there was a recent disaster that caused an evacuation in their area in the recent past (the last several years) and a total of 463 respondents (39.8%) they had evacuated in a recent disaster.

Key Findings Related to Household Preparedness

- *Compared to all other disability groups and across all indicators, persons with cognitive disabilities are much more likely to have steps in place for household preparedness, while persons who are hearing impaired are least likely to have steps in place for household preparedness.* Seventy percent of persons with cognitive disabilities have knowledge of a specific evacuation destination, 80 percent have a plan for what to take with them, 90 percent have a plan to stockpile medications, and 49 percent have knowledge of the location of a public shelter. This is compared to 48 percent of persons with hearing impairments who have knowledge of a specific evacuation destination, 55 percent who have a plan for what to take with them, 70 percent who have a plan to stockpile medications, and 29 percent who have knowledge of the location of a public shelter.
- *States with frequent, large-scale disasters, like hurricanes, are the most likely to have steps in place for household preparedness*. For example, for persons who live in areas frequently impacted by hurricanes, 74 percent have a plan for what to take in an evacuation, 52 percent have knowledge of the location of a public shelter, and 86 percent have a plan to stockpile medications. Compared to persons who live in areas where flooding has occurred, only 46 percent have a plan for what to take in an evacuation, 31 percent have knowledge of the location of a public shelter, and 70 percent have a plan to stockpile medications.
- *While the majority of respondents (75.2 percent) consider themselves prepared to evacuate, as many as one quarter of all respondents (24.8 percent) reported they were either not very well prepared or not at all prepared to evacuate in the event of a disaster.* For persons with significant disabilities, the number of persons who reported they were either not very well prepared or not at all prepared to evacuate increased to 37.4 percent.
- *The majority of respondents (80.1 percent) consider themselves prepared to shelter-in-place, while as many as twenty percent (19.4 percent) reported they were either not very*

well prepared or not at all prepared to shelter-in-place in the event of a disaster. For persons living in households reporting multiple disabilities, the number of persons who reported they were either not very well prepared or not at all prepared to shelter-in-place increased to 35 percent.

Key Findings Related to Disability Evacuation and Sheltering

- *While the majority of respondents indicate they are prepared to take care of themselves in a disaster*, *nearly one-quarter (24.8% and 19.4%, respectively) indicate they are either not at all prepared or not very well prepared to evacuate or shelter-in-place without assistance.*
- *Respondents with multiple disabilities within the household report a lower capacity for independent evacuation or sheltering*. Once 5 disabilities are indicated, however, respondents report being better prepared to shelter-in-place, from 22.5 percent of households with 4 disabilities reported up to 41.7 percent of households with 5 disabilities reported.
- *Respondents with multiple volunteer organization memberships have a better capacity to care for themselves in the event of a disaster*. Respondents with multiple memberships 3 or greater (65.8%) are well prepared to evacuate independently compared to persons with only 1 voluntary members (47.8%). Respondents without multiple memberships are less prepared to evacuate, with 23.5% of persons with only 1 voluntary membership (versus 11.4% of those with 3 or more memberships) indicating that they are not at all prepared or not very well prepared to evacuate independently.

Key Findings Related to Recent Disaster Behavior and Outcomes

- *Respondents with disabilities were more likely to evacuate in an actual disaster as the limitation on ADLs increased.* Those who reported no disabilities had the lowest percentage of evacuation (62%). Respondents with the most significant limitations in ADLs were more likely (76.2%) to evacuate.
- *Evacuation behavior varied by hazard type.* Respondents experiencing hurricanes were 82% more likely to evacuate. The reverse was true for flooding with 80.2% of respondents choosing not to evacuate. Wildfire respondents were almost 60% (57.1) likely to evacuate. Those who experienced chemical spills were about even, split between evacuating (48.2%) and not (51.2%).
- *The majority of respondents evacuated to homes of friends or family members in their most recent evacuation.* Nearly 50 percent went to homes of friends or family members. The remainder went to motels (23.3%), public shelters (7.8%), community shelters, such as church facilities (3.5%) and other (15.7%) locations.
- *Respondents with disabilities were more likely to suffer a difficult evacuation, than persons without disabilities.* Approximately, 59.5% of those with no disabilities present in the household stated their most recent evacuation experience went smoothly, compared to only 32.6 percent of respondents with disabilities in the household.

Key Findings Related to Sources for Disaster Information

- *A majority of respondents (63.6%) rely on television for disaster information, followed by 12.6% who rely on information shared by family, friends and/or neighbors*.
- *Persons with multiple disabilities are more likely to rely on family, friends, and/neighbors for information about an evacuation*. For those with no disability, only 7.1% of respondents rely on family, friends, and neighbors for information on evacuation. However, for those with 1or 2 disabilities that percentage more than doubles to 14.8% and 15.9% respectively. For respondents with 3 or more disabilities, 11.7% rely on

family, friends, and/or neighbors as their most important source of information about the evacuation.

- *Most persons with disabilities rely heavily on news organizations (45.5%) for their most important source of evacuation information*, followed by government announcements or warnings (24.8%), and family, friends, and/or neighbors (16.4%).
- *Persons with hearing and mental health disabilities use family, friends, and/or neighbors for their most important source of evacuation information at a rate higher than any of the other disability group* (31.1% and 21.9%, respectively). They also use news organizations at a lower rate (33.5% and 38.0%, respectively) than do all other persons with a disability.
- *As the number of disabilities in a household increases there is a greater likelihood of reliance on government announcements or warnings and on family friends, and neighbors for disaster information and a decreased likelihood of relying on news organizations.* While only 17.1% of those reporting no disability rely on government warnings, for those with 3 or more disability types 65.7% rely on government announcements or warnings as their most important source of information to find out about what was going to happen in an impending disaster. Also, only 7.1% of respondents reporting no disability predict that they would rely on family, friends, or neighbors, while at least 48.7% of those with 3 or more disabilities would rely on this source. For those with 3 or more disabilities, only 39.1% of respondents rely on a news organization as their most important source of information (compared to 58.4% of those with no disabilities reported) to find out what is going to happen in a disaster.
- *The majority of respondents in hurricane prone areas (68.1%), chemical disaster areas (56.4%) wildfire areas (48.0%), and flooding areas (48.4%) relied on television for their source of information in the most recent disaster and evacuation they experienced*. The second most used source of information varied by disaster type, including information from family and friends for those in hurricane (11.0%) and flood prone (29.0%) areas, information via radio in chemical disaster areas (17.9%), and police or fire persons who came door-to-door in wildfire prone areas (14.0%).

Key Findings Related to Perceived Risk and Vulnerability

- *The larger the impact of disability on a respondent's daily activities, the higher the perceived threat of harm from evacuation.* As many as 52.6% of persons with no disabilities reported consider evacuation "very unlikely" to cause serious harm versus 18.8% and 25.3% of those with significant and moderate impact on ADLs, respectively. As many as 52.3% of persons with no disability consider evacuation "very unlikely" to cause serious harm versus 18.0% of those reporting 3 or more disabilities.
- *The larger the impact of disability on a respondent's daily activities, the higher the perceived threat of harm from sheltering-in-place.* For those with no disability, 58.9% report that it is very unlikely that they will come to serious harm if sheltered in place, compared to only 32.5% of respondents with disabilities.
- *As impact to activities of daily living increases, respondents with disabilities are less likely to evacuate to homes of friends and family members and more likely to evacuate to public shelters.* As impact to ADLs increase, respondents reporting evacuation to homes of friends and family members drops steadily from 59.5% (for households with no disability reported) to 41.7% (for households reporting significant impact on ADLs). Inversely, evacuation to public shelter increases as ADLs increase, from 7.8% (for households with no disability reported) to 29.9% (for households reporting significant impact on ADLs).

Key Findings Related to Respondent Comments and Suggestions

- Respondents were asked to describe in their own words their single most important suggestion to other families of persons with disabilities for preparing for disaster and evacuation. The top six specific suggestions respondents made to other families of persons with disabilities were to: (1) bring medications or prescriptions (206 responses), (2) stockpile food and water (201 responses), (3) plan ahead (156 responses), (4) plan where to go and make sure the location will accommodate your needs (109 responses), (5) make sure that you arrange for help or assistance if it is needed (91 responses), and finally (6) keep money, or better cash, available in case of emergency (84 responses).
- *The top go kit items for people with disabilities are medications, food/water, and cash* – Fifty-four percent of respondents made suggestions for what to stockpile or bring in a go-kit. Respondents listed a number of items, but their top suggested item to stockpile for a go-kit was medications, followed closely by food and water and then cash.
- *The third most prevalent suggestion by respondents was for people with disabilities to "plan ahead"* – Respondents stressed the need for people with disabilities to make plans ahead of time. In the words of one household member in Florida, "prepare in advance; keep bags of medical supplies and meds ready at all times. It takes so much longer [for persons with disabilities] to evacuate than average people. No time when event happens to plan everything."

Implications of Study Findings

The results of this individual-level survey of persons with disabilities and their households suggest several areas for further research and/or preparedness. The most important implications include the following:

- ***There is a Greater Need for Financial and Other Resources to Support Evacuation for Persons with Disabilities***

From both the quantitative and qualitative findings of this study, it is clear that a majority of persons with a disability either cannot afford or do not have the resources necessary for an evacuation which lasts more than just a few days. Only about one-third of respondents in this study report a household income of $50 thousand or greater, while half of all Americans report having this income or greater. This means that persons with disabilities may lack the financial means to be highly prepared for a disaster, compared to the general population. The more qualitative findings of this study reinforces this finding. Most respondents who offered comments on the most important thing to know about evacuating emphasized the need for funds and for an extensive supply kit including vital prescription medications. This lack of means for evacuation will need to be carefully considered by emergency management, first responder, and disability provider organizations. Evacuation assistance and services for persons with disabilities will need to include material or financial evacuation assistance if all households are to be prepared to evacuate in a disaster. The provision of material and financial resources to households with a disability will need to be a significant part of organizational planning for disaster evacuations.

- ***There is a Greater Need for Preparedness Assistance for Persons with Hearing Impairments***

Given the lower levels of preparedness reported for persons with hearing disabilities, it will be important that special attention be given to organizational preparedness to assist those households that include persons with hearing impairments. This can be achieved by

organizational evacuation services which complement the preparedness of persons who are deaf and hard of hearing. In geographic areas with higher numbers of persons with hearing limitations, organizational evacuation plans should include evacuation services focused on the deaf and hard of hearing.

- ***There is a Greater Need for Preparedness Efforts in States Not Impacted by Hurricanes***

Persons with disabilities and their households in states not impacted by hurricanes are also less likely to be prepared to evacuate. Emergency management and disability service providers in states with floods, wild fires, and industrial disasters will need an even higher level of preparedness to assist persons with disabilities in evacuation, compared to other states. The demands on these organizations are greater given the relatively low level of preparedness of households in these states.

- ***There is a Greater Need for Preparedness Assistance in Household with High Rates of Disability***

The need for organizational assistance for persons with multiple disabilities is greater than for those households in which a single disability is present. Emergency management and disability services provider organizations will need to work together in a coordinated fashion to be able to meet the specific evacuation needs of persons with multiple disabilities, or households in which one or more members have a different type disability. The results described in this report emphasize the need for a high level of coordination among emergency management, first responder, and disability services provider organizations. Because persons with disabilities have multiple needs during an evacuation (e.g. assistive equipment or animals, medication, an attendant during stay in a shelter), inter-organizational coordination is especially important. Particularly for those with multiple disability conditions, coordination among the networks of disaster services and disability organizations is vital if continuity of care is to be available during an evacuation.

- ***Increasing Access to Social Networks Can Increase Better Preparedness, Response and Recovery for Persons with Disabilities***

A richer social network, even when part of that network results from membership in voluntary organizations, is a good predictor of evacuation behavior. A social network with family, a caregiver, and voluntary organizations facilitates the decision to evacuate. The influence of use of a caregiver for assistance with daily activities was found to be particularly important in facilitating evacuation. These results suggest that provision of a personal care assistant from disability services organizations, particularly during an evacuation, is likely to help persons with disabilities to accurately perceive disaster risk and have the capacity to evacuate in a disaster. Disability services organizations with personal care assistance programs should be carefully examined to determine how the personal care assistant facilitates the evacuation of persons with a disability and their household.

I. INTRODUCTION

The recent report from the National Council on Disability cites a "clear lack of research validating best practices" and "a lack of evidenced-based knowledge about how best to organize preparedness, response, and recovery efforts" for persons with disabilities (NCD 2009:14). Unfortunately, the substance of this critique endures despite repeated disasters and on-going pleas to address emergency preparedness challenges for persons who are most vulnerable to disaster, particularly those living with disabilities (Bascetta 2006; Bloodworth et al. 2007; Byzek & Gilmer 2001; Davis & Mincin 2005; DHS 2005; NCD 2006; NOD 2009).

Disasters such as the 1993 World Trade Center bombing and the attack on the World Trade Centers of 9/11 called into question previously held "wait-for-help" practices for evacuating persons with mobility impairments. Hurricanes Katrina and Rita in 2005 imprinted on the American consciousness the price that persons with disabilities pay when emergency and evacuation efforts do not sufficiently address their needs. Yet, even with so much attention on disability and disaster over the last decade, with a few exceptions we remain without much generalizable findings or information on evidence-based practices of what works for persons who are most vulnerable to disaster (cf. Byzek & Gilmer 2001; Dosa et al. 2007; Fischer et al. 1995; Juillet 1993; NOD 2005; White et al. 2007). This report is one effort in a larger project designed to produce such generalizable findings that can be used to further improve disaster evacuation planning for people with disabilities in communities across the U.S.

In 2007, researchers from Louisiana State University (LSU), Inclusion Research Institute Inclusive Preparedness Center (IRI/IPC) and West Virginia University (WVU) were awarded a grant by the National Institute on Disability Rehabilitation and Research (NIDRR) to conduct a nationwide study of key challenges faced by persons with disabilities during disaster evacuations and to develop evidence-based strategies that can be incorporated into current policies, practices, and emergency planning.

The goal of this project is to improve future planning and preparedness activities by governmental and non-governmental organizations that provide assistance to persons with disabilities and their households during emergency and disaster evacuations. This goal is accomplished through systematic assessment of the needs, behaviors, and attitudes of persons with disabilities and their households across conditions of hazard types, varied levels of hazard vulnerabilities, past experiences, and other relevant community conditions. This same evaluative approach is applied to how key service organizations address the management challenges of emergency and disaster evacuations, including issues particular to persons with disabilities.

The project research team is engaged in the collection and assessment of data relevant to issues affecting persons with disabilities and their households when emergency or disaster evacuations occur. Likewise, the team has also collected information in this area from key government officials, including emergency managers and responders, service providers, and other relevant organizations. The intent of the data collection and subsequent guideline dissemination efforts is to bring together individuals with disabilities and their service providers with the emergency management community to advance evacuation planning and to provide practical tools to improve outcomes for individuals with disabilities during evacuations.

A systematic and comprehensive assessment shows the unique issues confronting persons with disabilities in evacuation situations and the identification of the strengths and weaknesses of planning and preparedness across the United States at present. This research is intended to

provide practical and usable information to service providers, emergency managers, planners, and policymakers that allows improved planning efforts in meeting the unique challenges persons with disabilities face when emergency evacuations occur. Data from these both the individual- and organizational-level studies will be integrated to create guidelines that key decision-makers, disability provider and emergency preparedness organizations and agencies can use to improve existing evacuation plans for persons with disabilities. The project produces guidelines for incorporating the needs of persons with disabilities in emergency evacuation training and exercises along with delineating potential best practices for organizations that serve and support individuals with disabilities in disaster and evacuation.

Analysis and interpretation of data gathered in this study is designed to provide an empirical foundation that can be converted into practical tools and guidance for emergency managers, first response organizations, and disability service provider organizations relevant to the disability community. The research work will permit dissemination of evidence-based guidelines and suggested best practices from communities that have either recently faced large-scale evacuation. This can then be customized for urban, suburban, and rural locations across the United States, like those included in this study. Based on individual- and organizational-level study findings, along with a review of prior research and evaluations, these guidelines will include evidence-based best practices regarding evacuating persons with disabilities based upon expected patterns across various hazard types and geographic regions. In short, the key planned outcomes of this project are comprehensive planning guidance information that can be utilized by planners, disability service providers, and public officials responsible for emergency management and response.

The overall project includes three elements:

Research Component:
- Individual-level data collection
- Organization-level data collection

Applications Component:
- Evidence-based best practices documentation
- Community & Organizational assessment reporting

Training and Exercise Evaluation Component:
- Exercise development, testing, and evaluation reporting
- Training materials development

This report presents a comprehensive review of findings from the individual household-level data collection portion of the project's research component.

II. EVACUATION, DISASTER AND THE DISABILITY EXPERIENCE: PRIOR RESEARCH

Until the World Trade Center bombings in 1993, persons with mobility impairments had largely been told to "wait for help" to arrive (Klote et al. 1992). Representatives from the National Task Force on Life Safety and Persons with Disabilities, the City of New York Fire Department, and the Port Authority of New York and New Jersey, conducted interviews with 27 people with disabilities following the 1993 bombing, which killed six people and injured more than 1,000 others (Juillet 1993). This study revealed some important lessons suggesting that waiting for help may not be the best recourse during a building evacuation. Study participants with disabilities took an average of 3.34 hours to evacuate the building that day and four of these participants reported evacuation times ranging from five to nine hours.

Juillet (1993) identified several key lessons from this study. First, at least seven evacuees with disabilities experienced breathing problems related to asthma and smoke inhalation, suggesting that further training in how to deal with persons with breathing disorders during disasters is needed. Second, each flight of stairs had different numbers of steps and periodic "crossover" sections. Because these were not uniform, some people with visual impairments had difficulty exiting. Evacuation strategies that were successfully employed the day of the disaster included verbal cues from sighted evacuees and using a hand on the shoulder of the person in front to exit. Third, when the lights went out in the stairwell, it was no longer possible for people with hearing impairments to lip-read or use sign language. A flashlight would have been helpful for persons with hearing impairments to exit. Fourth, several persons with disabilities chose not to identify themselves when the original emergency evacuation plan for the building was developed, suggesting that not all persons with disabilities are comfortable identifying as such. Finally, many evacuees with disabilities did not wait for help to arrive. They chose to evacuate with the help of colleagues, suggesting that the "wait for help" strategy may not always be the best choice for persons with disabilities.

The inadequacy of the "wait for help" building evacuation strategy for persons with mobility impairments was confirmed in the attacks on the World Trade Centers on September 11, 2001. Although 125 evacuation chairs were purchased for individual building users following the 1993 bombing, only two persons with mobility impairments were successfully evacuated on September 11th using these chairs. We do not know how many people with disabilities died that day, but there were reports from those who did evacuate of at least one wheelchair user who along with his long-time friend waited for help and did not make it out. There were also many reports of persons who could not keep up during the evacuation of the Twin Towers. These were persons who were elderly, with respiratory conditions, and other limitations that prevented their getting out in time (Byzek & Gilmer, 2001).

The events of 9/11 sparked nationwide attention on emergency preparedness and preparedness for persons with disabilities who might be especially vulnerable during emergency or disaster situations. Disability groups followed with a number of studies and reports on how best to prepare and plan for persons with disabilities in disaster preparedness, response and recovery. Several made the call for including persons with disabilities in earlier stages of emergency planning (Davis & Mincin 2005; NCOD 2005; Kailes 2006; GFHR 2007) and others stressed the importance of persons with disabilities, their families and disability providers taking more responsibility for their own preparedness (Cameron 2008; Kailes 2002). There were also numerous reports on how best to incorporate different types of disability in emergency preparedness planning (Harris Interactive 2004; NOD 2009; NAD 2007; Person & Fuller 2007; Blanck 1995; Tierney, Petak & Hahn 1988).

To date, little empirical research exists on disability experience in disaster, nor specifically on disability evacuation experience in disaster. One group that has been a leader in empirical disaster research has been the Natural Hazards Center based out of the University of Colorado. Since 1976, they have been sponsoring Quick Response research on the human impact of natural disasters. These Quick Response Reports include case studies on the impact of a wide variety of natural disasters (Picou & Martin 2006; Paul 1999; Fischer et al. 2006; Patton 2003), including in some cases a focus on more vulnerable populations (Montz & Tobin 2004; Kuba et al. 2004; Lynn & Hill 2006) and on evacuation response in particular (Banks et al. 2006; Mitchell et al. 2005; Dow & Cutter 2000). These studies provide valuable empirical data on what individuals do during disaster and the Quick Response Program provides one of the few consistent resources for research in the immediate aftermath of disaster.

The events of 9/11 sparked a flood of attention to emergency preparedness, but still not sufficient attention to the impact of disaster for persons with disabilities. Even the 9/11 Commission Report that followed did not include any specifics on the experience of persons with disabilities during this event, nor recommendations to address key issues for persons with disabilities in future emergency planning efforts (9/11 Commission, 2004). It was not until Hurricanes Katrina and Rita struck the Gulf Coast that greater attention was paid to empirical research on disability, disaster and evacuation. For anyone who watched images of the 2005 Hurricanes Katrina and Rita, you may remember haunting images of persons in wheelchairs parked outside the Astrodome waiting for help arrive or persons and their chairs floating on air mattresses through the floodwaters. Or more chilling still, you may recall the stories of persons in homes and nursing homes who died unable to get out due to medical fragility or the charges of euthanasia by medical staff at Memorial Medical Center of medically fragile patients in the aftermath of the storm (Fink 2009).

The storms of 2005 sparked a focus on emergency preparedness for persons of color, for persons with less means to care for themselves in a disaster, and for persons with disabilities. The Department of Homeland Security and the U.S. Government Accountability Office used the 2005 hurricane events as a model to assess catastrophic planning processes nationwide (DHS 2006; GAO 2006a; GAO 2006b). There were a number of reports that looked at the impact of Katrina in terms of lessons learned for the general population (Styron 2006; Rowland 2007; HOR 2006; Brodie et al. 2006; Litman 2006). There were also a number of reports and studies done specifically focused on the impact of Katrina for persons with disabilities (GAO 2006c; Bloodworth et al. 2007; LaLiberte et al 2007; NCD 2006a; NCD 2006b; NSDUH 2008). The National Organization on Disability sent rapid assessment teams to the gulf region immediately following the disaster in 2005 (NOD 2005). Team members conducted 26 interviews and conducted site visits at 18 shelters, 4 community-based organizations, and 8 emergency operations centers. The Special Needs Assessment for Katrina Evacuees (SNAKE) Project found a severe disconnect between emergency management and special needs, reporting that only 36 percent of the shelters surveyed had a person trained and designated to help special needs persons and almost 87 percent of community-based organizations in the impacted area did not know how to link with emergency management.

In 2006, Glen White and researchers with the Research and Training Center on Independent Living (2007) conducted surveys, focus groups, interviews and site visits with 71 representatives of Centers for Independent Living (CILs) and Emergency Management in regions impacted by Katrina in Alabama, Mississippi and Louisiana. This study identified “significant gaps” in (1) pre-disaster planning by CILs, individuals with disabilities, and local emergency management agencies; (2) pre- and post-disaster communication within and among CILs, consumers, and

local emergency management agencies; and (3) pre-and post-disaster coordination between CILs and other disability organizations, local and regional emergency management and community supports (White et al. 2007).

In addition to the Katrina specific research, there were also a few reports and studies from this time that focused on the impact of disaster for persons who are elderly or medically frail (Aldrich & Benson 2008; Fernandez et al. 2002; O'Brien 2003; Gibson & Hayunga 2006). Research and commentaries agree that persons who are elderly, medically frail, or disabled are often extremely vulnerable in the event of a disaster. What may be seen as setbacks for able-bodied persons, can be life-threatening for persons who are elderly, medically frail or living with a disability.

Evacuation for persons with disabilities were highlighted in reports and studies that came out of both the hurricane seasons that impacted the gulf region in 2005 and 2008 and in the aftermath of periodic firestorms that required evacuations in California in 2007 and then again in 2009. There are a number of studies on mass evacuation for the general population (Gerber et al 2006; Fu et al. 2007; DOT & DHS 2006; Fischer et al 1995; Dow & Cutter 2002; Dombroski et al 2006; Dash & Morrow 2001; Burnside et al 2007; Chakraborty et al. 2005; Cohn et al. 2007) and a few that focus specifically on disability and evacuation (Bascetta 2006; Dosa et al. 2007, Frieden 2005). NCD conducted a nationwide assessment of the current state of transportation for persons with disabilities generally, identifying "significant gaps" in transportation for persons with disabilities particularly in rural communities (Frieden 2005). In a separate study, Bascetta identified challenges at all stages of evacuation for persons who are elderly or living in nursing homes, including challenges in "identifying [disability] populations, determining their needs, and providing for and coordinating their transportation" (Bascetta 2006:1).

A few studies looked at building evacuation for people with disabilities. One report suggests a few universally designed exit features and tips for evacuation that will assist persons with disabilities and others in exiting buildings (Christensen & Salmi 2007; Christensen, et al. 2007). Another offers key planning and emergency response suggestions for helping adults with mental retardation to exit buildings safely (Bannerman, et al. 1991). The U.S. Department of Homeland Security, the Federal Emergency Management Agency, and the U.S. Fire Administration also did a series of reports designed to assist persons who are blind or visually impaired, deaf or hard of hearing, and mobility impaired to exit buildings safely (DHS et al. 1999a; DHS et al. 1999b; DHS et al. 1999c).

A number of researchers call for making shelters universally accessible for persons with disabilities and to include shelter protocols that facilitate service to persons with disabilities, including allowing entrance for service animals and keeping family members together with persons with disabilities (Kailes 2008; DOR 1997; Cameron 2008). A number of researchers also note the importance of addressing mental health concerns for persons with disabilities in the aftermath of disaster (Friedon 2006; NOD 2005; NSDUH 2008; Person & Fuller 2007; White et al. 2007).

There have been many attempts to get a handle on how best to prepare vulnerable communities for disaster. In 2005, the Joint Commission on Accreditation of Healthcare Organizations issues a planning guide that emphasized two key strategies: (1) to enable persons to care for themselves and (2) to build on existing relationship to strengthen community preparedness (JCAHO 2005). This echoes the call from many disability organizations (Cameron 2008; Friedan 2006; NOD 2005; Kailes 2006), including the most recent efforts by the National Council on Disability which stresses the importance of better integration of the efforts

between the disability and emergency responder communities and the importance of individuals and caregivers accepting "personal responsibility" for preparedness (NCD 2009:17-19). The federal response has been to call for the full integration of persons with disabilities in all aspects of emergency preparedness, response and recovery; to promote through public awareness personal preparedness and better communication between emergency response/management and local volunteer/community-based organizations that might serve as key resources during disaster (FEMA 2008; GAO 2008; DHS 2005; DHS 2005).

III. DESIGN OF THE STUDY

As noted above, a basic motivation of this project is to address some of the gaps that currently exist in the research literature on disability, disasters and evacuation. The study was developed to provide information about persons with disabilities and experiences with disasters and evacuation and related issues. It was done in a way to maximize the generalizability of findings by considering multiple hazards, different types of evacuation incidents, different levels of hazards vulnerability, and different residential situations.

Data Collection: Sampling Individual-Level Survey with Persons with Disabilities and their Household Members

This first research element of the overall project effort consists of a sample of telephone or written interviews with persons with disabilities and their household members. Just less than half of the interviews were collected through random digit dial (RDD) telephone survey of the aging public. The other half were collected though a written mail/telephone survey of persons with significant disabilities who live in the community and receive services through 1915 (c) Home- and Community-Based Services (HCBS) Medicaid waivers, Centers for Independent Living, the Arc, and various deaf and hard of hearing organizations.

Sampling of the non-elderly sub-groups identified above was done by non-proportional quota sampling. Simple random sampling was not used because such an approach would likely capture only minimal numbers of persons with evacuation experience or who live in areas that have a reasonable likelihood of experiencing an evacuation event. Therefore, this project used a non-proportional quota sampling approach. A proportional quota sample, where some population parameter values are known or can be reasonably estimated, is not possible in these cases. Appendix A provides more detailed information about the survey's sampling approach.

Research findings contained in this report are based on 1162 telephone and mail-in survey interviews with persons with disabilities and their household members in seven states known to have had mass scale evacuation in the recent past. The survey work was conducted in four successive samples of distinctive groups relevant to the larger disability community beginning in the summer of 2008 and completed in December of that year. A telephone survey of elderly adults living at home was performed using traditional random sampling (random digit dial) techniques in the study area. For the remaining sub-group samples, comprising the other half of the sample, participants were contacted through a variety of organizations that serve and support persons with disabilities. These responses were collected though a written mail survey, which also gave the option of a toll-free interview by telephone.

Participating organizations included Centers for Independent Living that serve persons with various kinds of disabilities, Medicaid state agencies that supervise physical disability and mental retardation/developmental disability (MR/DD) Medicaid 1915 (c) home- and community-

based services waivers, Arcs for persons who have cognitive disabilities, and deaf and hard of hearing organizations.

Due to HIPAA requirements, contact lists of clients or customers of these organizations were not available to the researchers to serve as a sample frame for each subgroup. As a result, the approach adopted was as follows: participating organizations were given a batch of survey instruments and were given instructions of how to randomize selection of respondents within designated geographic areas (designated by ZIP codes). Those organizations then mailed survey invitation letters to either a selection of clients who lived in each of the targeted sample areas. Individuals with disabilities or a member of their household then contacted researchers, completing the survey either via a toll-free hotline or by mailing the survey. Participants received a small financial incentive (a $10 retail gift certificate card) for completing the survey.

Research included locations across the country known to have large-scale evacuations in the past several years. In order to obtain persons with evacuation event experience, the sample proceeded by selecting evacuation "higher risk" areas: those areas that have had at least one recent evacuation event in the last three or four years. These geographic areas were paired with "relatively lower risk" areas: those areas somewhat less prone to evacuation incidents – based on historical hazards loss information and prior official disaster declarations. These comparison areas contain potential hazards vulnerabilities but have not had a recent evacuation event (in the last three or four years). The reason for this approach was to be able to compare behavior, perceptions and preparedness related to disasters in order to maximize the generalizability of the findings.

The study areas selected included San Bernardino and San Diego counties in California; Collier and Jackson counties in Florida; New Orleans and Terrebonne parishes in Louisiana; St. Louis, St. Charles and Lincoln county in Missouri; the city of Apex, North Carolina; Logan county, West Virginia; and Jefferson and Tarrant counties in Texas. Large scale disasters and evacuation events targeted included wild fires in San Diego county, California (October 2007); a toxic spill in Apex, North Carolina (October 2006); flooding in the St. Louis area in Missouri (March 2008) and several southern West Virginia counties (May 2009); hurricanes and flooding in Collier county, Florida (2004 and 2005), Orleans Parish, Louisiana (2005) and Jefferson county, Texas (2005).

Analysis Presented in the Report

Analysis includes an overview of the frequencies of each question as well as cross-tab analysis by sub-groups, including by disability, by geographic area, type of hazard, and by social and organizational support. More specifically throughout this report relationships of key indicators relating to disaster evacuation preparedness, behavior and experience, and related respondents judgments of evacuation-relevant issues are examined by considering the following seven broad groups of explanatory or predictive factors:

Type, Number and Disability Impacts on ADLs. The disability sub-group was defined using three different measures: type of disability, number of disabling conditions, and a three-scale reported level of limitation impacting activities of daily living (ADLs). One important sub-group is by type of disability. Each person was asked to select type of disability that applied to either themselves or to a household member. These choices included medical, mental health, cognitive / intellectual, vision, mobility, and hearing. Respondents were allowed to check all that apply. A second measure of disability was by the number of disabilities indicated. Each person was asked to select type of disability that applied to either themselves or to a household

member. The 'Number of Disabilities' sub-group indicates how many disability categories were marked for each respondent. In this study, respondents reported from 0 to 5 types of disabilities in a household. A final measure of disability included a response to a 4-part scale of activities of daily living (ADL). Respondents were asked to what degree their disability limited their activities in daily living. This ADL scale ranged from 0 for no limitation, to minimal limitations (= 1), moderate limitation (= 2) and finally severe limitations (= 3).

Geographic Area, Hazard Type, and Disaster Experience. Evacuation planning behavior has been examined by state of residence and by hazard type. In this study, seven states were selected because of recent disaster and mass-scale evacuation experiences. California was selected for evacuations due to recent wild fires in San Diego county (October 2007), and both St. Louis, Missouri (March 2008) and Logan county, West Virginia (May 2009) were selected for evacuations due to flooding. Collier county, Florida (2004 and 2005), Orleans Parish, Louisiana (2005), and Jefferson county, Texas (2005) were selected for evacuations dues to hurricanes and storm-related flooding. The city of Apex, North Carolina (October 2006) had experienced evacuation due to a chemical disaster. Respondents were asked if they had any experience with a disaster like a hurricane, flood or chemical accident that caused people living in or near their neighborhood to evacuate.

Social and Organizational Support. Social and organizational support was measured using three indicators: availability of social support during a crisis, membership in supporting organizations, and experience accessing supporting organizations during crisis.

Perceived and Actual Social Support in Personal Crisis and Disaster. Respondents were asked if they strongly agreed, agreed, disagreed or strongly disagreed with the statement "During a crisis such as an illness or accident, I receive adequate help and support form family, friends or neighbors." This item was meant to assess respondents perceived social support in the form of help in a personal crisis. Respondents with actual evacuation or disaster experience were asked if they strongly agreed, agreed, disagreed, or strongly disagreed with the following statement: "During the disaster, I received help and support from family, friends or neighbors." Both questions gave indication of whether respondents had experienced support in either a low-level crisis or high-level disaster.

Memberships in Organizations. Next, respondents were asked about their organizational affiliations and were given a list from which to select. Organizational affiliations included membership to: a church or faith-based organization, a community charitable services group, a local civic organization, a local seniors center, and a sports or other recreation club. Respondents could also indicate 'None' for having no memberships or volunteer positions in organizations or 'Other'. Memberships in different types of organizations often provides people with more and different types of information and other resources which come as part of membership or volunteering.

Help from Organizations. Respondents were asked about the types of organizations that helped them in a recent disaster. These included a church or faith-based group, a civic group, a fire or police department, a state or federal government agency, and a local health care organization. Respondents could also indicate no help from any organization, indicate that there was no recent disaster, or specify 'Other' community or organization support.

In the following sections, we highlight findings from this study by topic area. Findings include: persons with disabilities and their household preparedness, capacity to manage household

needs during disaster, disaster evacuation communications, perceived risk and vulnerability, and a qualitative assessment of individual behavior and perceptions.

IV. SAMPLE DEMOGRAPHICS

Study findings are based on analysis of 1162 telephone and mail-in survey interviews with persons with disabilities and their household members in seven states known to have had mass scale evacuation in the recent past. Interviews were focused in high- and moderate vulnerability counties, including San Bernardino and San Diego counties in California; Collier and Jackson counties in Florida; New Orleans and Terrebonne parishes in Louisiana; Apex, North Carolina; Logan county, West Virginia; and Jefferson and Tarrant counties in Texas. Large scale disasters and evacuation events targeted included wild fires in San Diego county, California (October 2007); a toxic spill in Apex, North Carolina (October 2006); flooding in the St. Louis area in Missouri (2007) and several southern West Virginia counties (2008); hurricanes and flooding in Collier county, Florida (2004 and 2005), New Orleans parish, Louisiana (2005) and Jefferson county, Texas (2005).

The following table presents a more detailed demographic picture of the study sample. A large minority (40.38%) of households in this sample have members 65 years of age or older. This is because the sample was stratified by age so that a larger percentage of respondents would be 55 years of age or older. After age 55, people are more likely to have a disability, and this is why the elderly survey was part of this study. A large majority of respondents (85.61% are white, non-Hispanic). This is consistent with the overall U.S. population, in which 79.8% of persons reported they were white, non-Hispanic, for the U.S. Census. African-American and Hispanic people made up 18.18% of the sample, with 48 respondents in each group. Almost half (45.65%) of respondents who reported their household annual income had incomes less than 20 thousand dollars. Only about 30.8% reported a household income of $50 thousand or above, lower that the U.S. population, in which half of households report an income of $50,740 or greater. Similar to income percentages, (45.73%) had a high school degree or less formal education.

Table 4.1: Sample Information: Basic Demographics

Category	Frequency	Percentage
Gender		
Female	664	59.7
Male	449	40.3
Household Composition		
With persons 65 & older	399	40.4
With children (under 6)	66	6.7
Ethnicity		
White	452	85.6
African American	48	9.1
Hispanic (non-white)	48	9.1
Asian-American	3	0.6
Native American or Indian	3	0.6
Hawaiian or Pacific Islander	3	0.6
Household Income		
Less than 20k	420	45.7
20 – 50k	217	23.6
Greater than 50k	283	30.8
Education		
High School or less	514	45.7
Undergraduate or Associate	476	42.4
Graduate	134	11.9

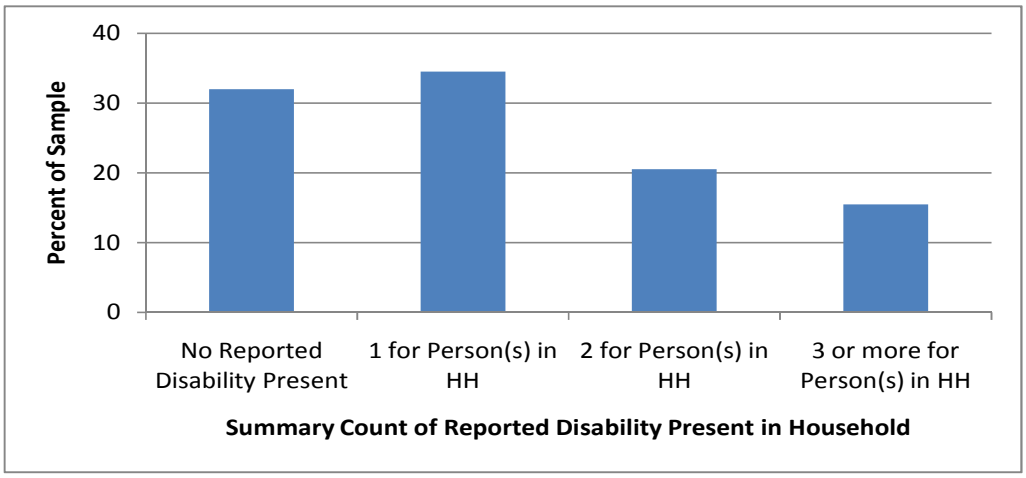
Respondents were asked to select all disability categories that applied to either themselves or their household member with a disability. As shown in Table 4.2, the top two types of disabilities identified by respondents included medical disability (36.6%), followed by mobility limitations (28.7%). These two disability types accounted for 65.31% of disabilities reported by respondents. Other disabilities identified by respondents, in order of frequency, included hearing impairments (14.5%), mental health disabilities (11.8%), cognitive or intellectual disabilities (10.9%), and visual impairments (10.9%). The sample was partly stratified by hearing impairment type of disability, in order to increase representation of this disability type in the sample, and to help ensure enough cases for each type of disability so that comparisons among disability types can be made. A total of 357 of 1162 total respondents reported that they did not have a disability. These individuals were all members of households with at least one household member aged 55 and older. The fact that each disability type, including those with no disability, has at least 100 cases, and as high as 425 cases per category, ensures the statistical power to reveal statistically significant differences among disability types among the sample.

Table 4.2: Sample Information: Disability Characteristics

Disability Category	Frequency	Percentage
Medical	425	36.6
Mental Health	137	11.8
Cognitive or Intellectual	127	10.9
Decreased Mobility	334	28.7
Visual Impairment	127	10.9
Hearing Impairment	168	14.5
Other	134	11.5

As displayed in Figure 4.1, over 34% of the sample reported 2 or more types of disability. Because respondents were given the opportunity to report more than one type of disability, the sample has information on co-morbidity of disability conditions. Figure 4.1 displays percentages when the instances of 3, 4, and 5 disability types are collapsed into the single category of "3 or more" disability types.

Figure 4.1: Percentages of Multiple Disability Conditions per HH



As shown in Table 4.3 and Figure 4.2, respondents in this study sample are from seven different states all of which have experienced large-scale disaster with an evacuation in the recent past. These states are distributed in various regions of the country, such as the Atlantic Coast (North Carolina, Florida), the central and western Gulf Coast (Louisiana, Texas), the Mid-Atlantic area (West Virginia), the Midwest (Missouri), and the West Coast (California). The state in which the largest number of respondents report residing is Texas, with 22.8% of study respondents. Texas is followed by Louisiana (17.1%), California (15.9%), Missouri (10.8%), North Carolina (9.2%), and West Virginia (8.6%).

Figure 4.2: Percent Respondents by State of Residence

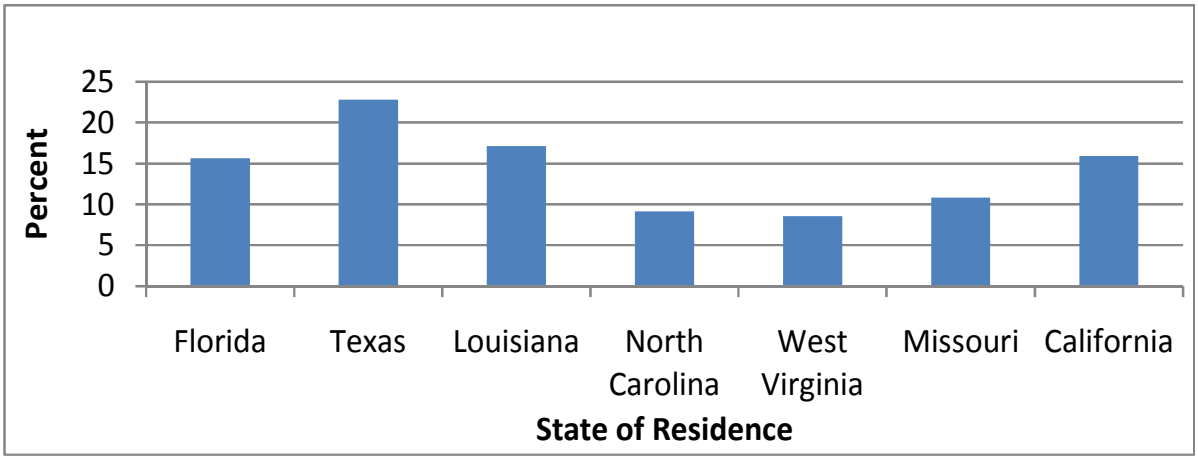


Table 4.3: Sample Information: Regional and Hazard Information

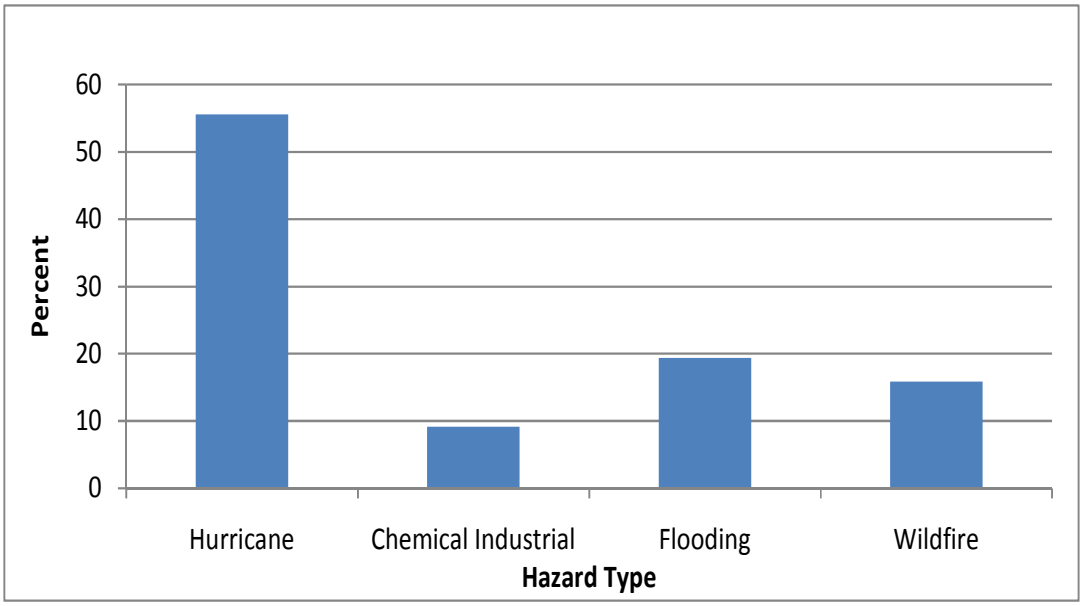
State / Hazard	Frequency	Percentage
State of Residence		
Florida	181	15.64
Louisiana	198	17.11
Texas	264	22.82
North Carolina	106	9.16
West Virginia	99	8.56
Missouri	125	10.80
California	184	15.90
Predominant Hazard in Region		
Hurricane	643	55.57
Chemical / Industrial	106	9.16
Flood / Flash Flood	224	19.36
Wild Fire	184	15.90

The geographic distribution of these states helps to ensure that the sample for this study is representative within geographic areas of the United States. Each of these states also contains counties at both high and low risk for disasters, including both rural and urban counties. The inclusion of these counties differing by disaster risk and urban/rural characteristics strengthens the representativeness of the study sample and allows for comparisons by geographic region.

The choice of these seven states also allows for examination of individual evacuation behaviors across a variety of types of hazards. See Table 4.3 and Figure 4.3. The predominant hazard affecting most of the respondents is hurricanes (55.6%), followed by floods (19.4%), wild fires

(15.9%), and chemical / industrial accidents (9.2%). Evacuation conditions and behaviors are likely to differ by type of disaster hazard, and the numbers of respondents (greater than 100) in each category of disaster will allow for comparison among disaster hazard type. Both natural and technological disasters are included in this study and both rapid onset (chemical / industrial, flood / flash flood) and slow onset disasters (hurricane, wild fire) for which warning time is longer are also included. This distribution of respondents by hazard type will allow for policy guidance and exercise models to be developed that meet the specific demands of evacuations in different types of disasters.

Figure 4.3: Percent of Dominant Hazard Type in Respondents' Residential Location



V. FINDINGS: PERSONS WITH DISABILITIES AND THEIR HOUSEHOLD PREPAREDNESS

An initial area of attention for this study was to ask respondents about how prepared they are to evacuate their homes and to care for themselves in the event of a major disaster. Building on the central principle of self-determination in disability and on the growing reality that many persons (disabled and able-bodied) will need to be able to care for themselves in the first 72 hours of a disaster, this area of investigation is an important step in evacuation practices for persons with disabilities.

The study's survey instrument asked several questions related specifically to household preparedness. The first involves planning for a specific evacuation destination: "If you had to leave your home for several days or more because of a disaster, like a major flood or hurricane, do you have a specific destination that you would travel to?" The second item asks about specific plans for what the household or individual would take with them for an evacuation of at least several days: "Have you or anyone in your household made specific plans for what you would take with you if you had to leave your home for several days or more because of a disaster?" The third item is about the location of a public emergency shelter: "Sometimes during disasters, people have to go to public shelters if there is an evacuation. Do you know where a public emergency shelter is located in your area?" The final item has to do with planning for vital daily prescription medications: "Do you or someone in your household have a plan to keep an available supply of those medications if you had to leave home for several days or more because of a disaster?"

Overall findings suggest that persons with disabilities and their household members are somewhat prepared for disaster. A majority of study respondents have a specific destination they would travel to (60 percent); have made specific plans in the event of evacuation (65 percent); and, for those who require prescription medications, have an available supply (81 percent). However, perhaps more important is to take note that 40 percent have no specific destination in mind and 55 percent do not know where a public emergency shelter in located in their area.

Household Preparedness by Disability Type, Number, and Severity

There were several indicators for household preparedness that were used in this study, including: knowledge of a specific evacuation destination, plan for what to take in an evacuation, knowledge of the location of a public emergency shelter, and plan for stockpiling medications prior to a disaster. In this section, these indicators for household preparedness were analyzed by cross tab analysis, looking for distinctions by type of disability, level of limitation in activities of daily living (ADL), and by number of disabilities present in a household. Findings reveal several patterns. First, persons with cognitive and intellectual disabilities consistently rank highest in terms of household preparedness, while persons with hearing impairments rank the lowest. Also, persons with the most significant disabilities impacting activities of daily living (ADL) tend to be the least prepared.

All respondents were asked the following question: "…if you had to leave your home for several days or more because of a disaster, like a major flood or hurricane, do you have a specific destination that you would travel to?" Table 5.1 shows the frequency distribution for all respondents. The table shows that about 60 percent of all respondents say they have a specific travel destination in mind if they have to evacuate. However, when one assesses differences based on particular disability conditions, some important variation is revealed.

Using an odds ratio, we can determine the likelihood of seeing a particular outcome of interest—in this case, the likelihood that an individual household has a specific evacuation destination in mind (Tables 5.1 and Figure 4.1). For simplification of assessment, one can compare the likelihood that respondents from households reporting a disability present have a planned evacuation destination to those households that do not report any persons with a disability residing there. Comparing just these two categories, the odds ratio shows that households that reported no disability present are 1.44 times more likely to have a specific destination than households that do report having a person or persons with a disability present. (The odds ratio computation is 1.92:1.33 when the ADL scores are collapsed into a single category of disability present or not.) This indicates some possible degree of advantage or ease in prior planning evacuation planning for those households in the general public that have no members reporting a disability.

Table 5.1: Frequency Table – Respondents with a Specific Evacuation Destination

Response	Frequency	Percent
Yes	683	59.8
No	460	40.2
Total	**1,143**	**100.00**

Table 5.2 presents the results of a cross tab analysis comparing whether persons with disabilities and their households have a specific evacuation destination by disability. The results show that those with a cognitive or intellectual disability are more likely than those with other types of disability to have a specific destination as part of their household disaster plan. Nearly seventy percent (69.5%) of individuals with a cognitive or intellectual impairment have a specific destination, compared to persons with medical impairments (56.0%), mental health impairments (55.5%), mobility impairments (54.8%), visual impairments (56.3%) and less than 50 percent of those with hearing impairments (47.9%). The difference between those with a cognitive or intellectual disabilities and those with hearing impairments is 19.6% and the difference between hearing and the next lowest scoring group (mobility) is 6.9% suggesting that those with cognitive versus hearing impairments represent those disability groups who are most and least prepared in relation to having a specific travel destination pre-selected.

Table 5.2: Knowledge of Specific Evacuation Destination by Disability Type

Knowledge of Specific Evacuation Destination	Type of Disability Present in Household						
	Cognitive	Medical	Mental Health	Mobility	Vision	Hearing	**Total**
Yes	69.5 (107)	56.0 (241)	55.5 (76)	54.8 (189)	56.3 (72)	47.9 (79)	(764)
No	30.5 (47)	44.0 (189)	44.5 (61)	45.2 (156)	43.8 (56)	52.1 (86)	(595)
Total	100.0 (154)	100.0 (430)	100.0 (137)	100.0 (345)	100.0 (128)	100.0 (165)	(1359)

As shown in Table 5.8, those with cognitive or intellectual disabilities are also very likely to have a plan for keeping a supply of vital medications, while the hearing impaired are less likely than other disability groups to have such a plan (90.1% versus 70.4%). This same pattern of preparedness where persons with cognitive disabilities are most prepared compared to persons with hearing impairments repeats across all preparedness indicators (see Tables 5.2, 5.4, 5.5, and 5.8). The cross tabs for the cognitive / intellectual and the hearing disabilities are both statistically significant, at beyond a .01 percent level of confidence. For those with cognitive / intellectual limitations, the Pearson $\chi 2$ value = 11.76 (df = 1, n = 799), with an effect size (eta) η =.12. For those with hearing limitations, the Pearson $\chi 2$ value = 7.34 (df = 1, n = 799), with an effect size (eta) η = .10.

Table 5.3 Knowledge of Specific Evacuation Destination by Limitations in Activities of Daily Living (ADL)

Knowledge of Specific Evacuation Destination	Reported Limitation in Activities per ADL				
	No Disability	Minimal	Moderate	Significant	**Total**
Yes	65.7 (226)	60.0 (138)	58.0 (131)	53.9 (159)	59.7 (654)
No	34.3 (118)	40.0 (92)	42.0 (95)	46.1 (136)	40.3 (441)
Total	100.0 (344)	100.0 (230)	100.0 (226)	100.0 (295)	100.0 (1095)

Like Table 5.2, Table 5.3 examines the prevalence of a specific evacuation destination as part of household planning among persons with disabilities. The influence of level of severity of limitations on activities of daily living (ADL) on household evacuation planning is shown in this table and includes persons with no limitations, minimal, moderate and significant limitations. Note that persons with no limitations included a number of participants in the elderly portion of the survey, whom did not identify as having a disability. Findings indicate a disturbing trend that the greater the limitations reported by individuals with disabilities, the lower the likelihood that respondent's household evacuation planning specifies an evacuation destination. In other words, those with greater limitations were less likely to have a plan for where to evacuate. While only about a third (34.3%) of those with no limitations in ADL do not have a specific evacuation destination in mind, nearly one-half (46.1%) of persons whose disabilities leads to significant limitations have no specific destination as part of their household's disaster plan. For this cross tab, the Pearson $\chi 2$ value = 9.56 (df = 3, n = 1095), with an effect size (eta) η = .09 and Gamma = .14.

Table 5.4. Plan for What to Take in an Evacuation by Disability Type

Plan for What to Take in Evacuation?	Type of Disability Present in Household						
	Cognitive	Medical	Mental Health	Mobility	Vision	Hearing	**Total**
Yes	80.3 (126)	65.5 (285)	67.4 (93)	67.7 (235)	63.3 (81)	54.5 (91)	(911)
No	19.7 (31)	34.5 (150)	32.6 (45)	32.3 (112)	36.7 (47)	45.5 (76)	(461)
Total	100.0 (157)	100.0 (435)	100.0 (138)	100.0 (347)	100.0 (128)	100.0 (167)	(1372)

Table 5.4 indicates that from one-third to nearly one-half of respondents have no plans for what to take in an evacuation lasting several days or more. Though having a specific destination a household would travel to during an evacuation is a more powerful indicator of household planning, this table is a second measure for assessing household preparedness. Findings reveal that those with a cognitive / intellectual disability are much more likely to have a plan for what to take in an evacuation (80.3%) than those with other types of disabilities. Again, those with hearing impairments (54.5) were least likely to have a plan for what to take and persons with medical (65.5%), mental health (67.4%), and vision impairments (63.3%) fell somewhere in between. This finding is consistent with results across all preparedness indicators, in which persons with cognitive disabilities are the most prepared, while persons with hearing impairments are the least prepared.

These findings are also consistent with results displayed in Table 5.3, which show that over forty percent of all respondents do not have a specific destination that they would travel to in an evacuation, and that those whose disability is significantly limiting for activities of daily living nearly half of respondents do not have a specific evacuation destination in mind. For the cross tab concerning those with cognitive / intellectual disabilities, the Pearson $\chi 2$ value = 17.55 (df = 1, n = 807), with an effect size (eta) η = .15 and Pearson's r = -.15.

Table 5.5: Prior Public Shelter Location Awareness by Disability Condition

Knowledge of a Public Shelter	Type of Disability Present in Household						
	Cognitive	Medical	Mental Health	Mobility	Vision	Hearing	**Total**
Yes	49.0 (76)	42.8 (184)	44.1 (60)	41.6 (142)	40.9 (52)	28.9 (48)	(562)
No	51.0 (79)	57.2 (246)	55.9 (76)	58.4 (199)	59.1 (75)	71.1 (118)	(793)
Total	100.0 (155)	100.0 (430)	100.0 (136)	100.0 (341)	100.0 (127)	100.0 (166)	(1355)

Table 5.5 compares knowledge of a public shelter by disability type and indicates that between 50 and 60 percent of most persons with disabilities do not know where shelters are located in their area. Note: knowledge of shelters while not a strong indicator of preparedness is a fairly good indicator of previous shelter knowledge. Some states, such as Florida, announce the location of these shelters during both non-disaster and disaster periods. Other states, such as Louisiana, will announce the location of public shelters only in the time period directly preceding a hurricane. What stands out, however, is the very low frequency of knowledge about public shelter locations among those with hearing limitations, where 71.1% indicate no knowledge of the location of public shelters in their area. This lack of household preparedness with regard to shelter information among persons with hearing impairments is consistent with the results shown across all preparedness indicators by disability type. Only for those with a cognitive / intellectual disability is the likelihood of knowing the location of a public shelter near fifty percent (49.0%). For the hearing impaired, the Pearson $\chi 2$ value = 15.66 (df = 1, n = 799), with an effect size (eta) η = .14.

Table 5.6 shows data comparing the total number of types of disabilities reported by household and its association with knowledge of the location of a public shelter for use in an evacuation. For disability, respondents were able to indicate the number and type of disabling conditions experienced by all members of the household who experience disabilities. More than 35% of respondents indicated multiple disabilities in their household. This table shows that the greater the number of disabling conditions experienced in a household, the lower the likelihood of household members knowing the location of a public evacuation shelter. For example, while 52.9% of persons with no disability in their households know of a public shelter, only 32.5% of those with four disabilities know of a public shelter. This means that the typical household which has a member with a disability does not have knowledge of a public shelter, and those households with 4 disabilities are very unlikely to have knowledge of a public shelter for use during an evacuation.

Table 5.6: Prior Public Shelter Location Awareness by Total Number of Disabilities

Knowledge of a Public Shelter	Total Number of Disabilities Present in Household						
	0	1	2	3	4	5	**Total**
Yes	52.9 (185)	42.1 (167)	45.7 (105)	39.3 (42)	32.5 (13)	41.7 (5)	45.5 (517)
No	47.1 (165)	57.9 (230)	54.3 (125)	60.7 (65)	67.5 (27)	58.3 (7)	54.5 (619)
Total	100.0 (350)	100.0 (397)	100.0 (230)	100.0 (107)	100.0 (40)	100.0 (12)	100.0 (1136)

Because greater numbers of disabilities result in more severe limitations in activities of daily living, the results of this cross tab are consistent with those of Table 5.3, which shows knowledge of a specific evacuation destination by level of limitation in activities of daily living. A cross tab including both variables, total number of disabilities and limitations in activities of daily living has a $\chi 2$ value = 1223.91 (*df* = 15, *n* = 1103), with an effect size (eta) η = .84, which is a highly statistically significant relationships, at beyond the 99.9% level of confidence. For the cross tab in Table V1.6, the Pearson $\chi 2$ value = 14.01 (*df* = 5, *n* = 1136), with an effect size (eta) η = .11, which is a statistically significant relationships, at better than the 95% level of confidence.

According to the odds ratio, we can compare the odds of a household of a person with disabilities to a household without to see the impact of disability presence on shelter awareness. In this case, respondents in households without person(s) with disabilities are 1.51 more likely to report knowledge of the location of a public evacuation shelter in their community. (The odds ratio computation is 1.12:.74 when the number of disabilities reported is collapsed into a single category of disability present versus no reported disability present in the household.) This suggests that households with a disability present do not have a greater awareness of sheltering options than other members of the public.

Table 5.7: Prior Public Shelter Location Awareness by Limitation in Activities of Daily Living (ADL)

Knowledge of Public Shelter	Limitation in Activities per ADL				
	None	Minimal	Moderate	Significant	**Total**
Yes	52.6 (182)	42.4 (97)	37.9 (86)	45.2 (132)	45.4 (497)
No	47.4 (164)	57.6 (132)	62.1 (141)	54.8 (160)	54.6 (597)
Total	100.0 (346)	100.0 (229)	100.0 (227)	100.0 (292)	100.0 (1094)

Looking at the relationship between prior knowledge of a public shelter and level of effects on ADL, we find that less than one-half of respondents reporting a disability have prior knowledge of the location of a public shelter for use in evacuation during a disaster or other emergency. This means that the typical household with an individual with a disability does not have knowledge of a public shelter as part of their household preparedness. Looking closely at findings in Table 5.7, we see that as the effects on ADL increases from no limitations to moderate limitations there is a corresponding decrease in the frequency of respondents who report knowledge of a public shelter for evacuation. However, when we look at significant limitations, we find that those with significant ADL limitations are as likely to know about a public shelter (45.2%) as are all individuals with disabilities who responded to this question (45.4%). It seems possible that respondents with severe limitations in ADL may be more likely (than respondents with minimal or moderate limitations in ADL) to recognize the need for a public shelter to avoid injury or loss of independence during a disaster. This cross tabs has a Pearson $\chi 2 = 13.28$ ($df = 3$, $n = 1094$), with an effect size (eta) $\eta = .11$, which is a highly statistically significant relationships, at beyond the 99.5% level of confidence.

Table 5.8. Plan to Stockpile Medications by Disability Type

Plan to Stockpile Medications	Type of Disability Present in Household						
	Cognitive	Medical	Mental Health	Mobility	Vision	Hearing	**Total**
Yes	90.1 (109)	79.9 (298)	80.0 (88)	79.9 (230)	75.2 (79)	70.4 (81)	79.6 (885)
No	9.9 (12)	20.1 (75)	20.0 (22)	20.1 (58)	23.8 (25)	28.7 (33)	20.2 (225)
Total	100.0 (121)	100.0 (373)	100.0 (110)	100.0 (288)	100.0 (104)	100.0 (114)	100.0 (1110)

Respondents were asked if they had anyone in the household who required vital daily prescription medications and whether those who did had a plan to keep an available supply in the event of a disaster. Table 5.8 reveals another important component of household preparedness. From this table it is clear that the large majority of persons with prescription medications are prepared with necessary supplies of medication in the event of disaster. On average, almost 80 percent (79.6%) of all persons with disabilities had plans to stockpile medications. Findings also indicate that those households with a member with a cognitive or intellectual impairment are much more likely (90.1%) than those with other types of disabilities to have a plan to keep an available supply of medications in case of a disaster. Consistent with the above results, which show that those with a hearing impairment are less likely than those with other types of disabilities to have a fully developed household plan for evacuation, this table shows that only 70.4% of those with a hearing disability have a plan to stockpile medications. A cross tab including those with cognitive or intellectual disabilities and a household plan to keep an available supply of medication has a $\chi 2$ value = 9.52 (df = 2, n = 623), with an effect size (eta) η = .12. A cross tab including those with hearing disabilities and a household plan to keep an available supply of medication has a $\chi 2$ value = 8.95 (df = 2, n = 623), with an effect size (eta) η = .12.

Household Preparedness by State and Hazard Type

Geographic location and type of hazard was considered important variables in determining overall household preparedness. This study included seven states (California, Florida, Louisiana, North Carolina, Missouri, Texas, and West Virginia) and four different types of hazard (hurricane, wildfire, flooding, chemical/industrial). Findings revealed clear patterns by both state and hazard type with Florida and Louisiana (hurricane prone areas) typically scoring highest on household preparedness indicators. Lowest preparedness rankings on indicators included Missouri, West Virginia and areas prone to flooding.

Table 5.9. Knowledge of Specific Evacuation Destination by State of Residence – All Respondents

Knowledge of Specific Evacuation Destination	State of Residence							
	CA	FL	LA	NC	MO	TX	WV	**Total**
Yes	64.5 (118)	60.8 (110)	87.3 (172)	48.1 (50)	47.2 (59)	72.1 (189)	44.4 (44)	64.5 (742)
No	35.5 (65)	39.2 (71)	12.7 (25)	51.9 (54)	52.8 (66)	27.9 (73)	55.6 (55)	35.5 (409)
Total	100.0 (183)	100.0 (181)	100.0 (197)	100.0 (104)	100.0 (125)	100.0 (262)	100.0 (99)	100.0 (1151)

Tables 5.9 and 5.10 look at the relationship of two household preparedness indicators – knowledge of specific evacuation destination and plan for what to take in an evacuation – by geographic region. Table 5.9 shows overwhelmingly that residents with disabilities in Louisiana are most likely to have a specific evacuation destination in mind (87.3%), compared to nearly 65 percent (64.5%) of persons with disabilities when all locations are considered (for all respondents in the sample). Texas, California and Florida residents with disabilities are also well prepared in relation to prior selection of an evacuation destination, with percentages of 72.1%, 64.5% and 60.8%, respectively. The states that ranked lowest with less than half of respondents reporting a specific evacuation destination included North Carolina (48.1%), Missouri (47.2%) and West Virginia (44.4%). It seems likely that those states with a history of repeated disaster experiences and/or the nature of the disaster, such as hurricanes in Florida, Louisiana and Texas and recurring wild fires in California may be impacting a household's tendency to prepare. These differences may also be explained partly by more extensive evacuation planning at the state level. It may be the case that specific destinations for evacuation in a particular state is highly contingent upon the nature, extent, and severity of several possible types of disasters, in which case residents in affected areas are given a destination only after disaster strikes. There may be additional factors which account for these differences among states, given that hazard types in Louisiana and Florida are hurricanes, while in North Carolina the hazard recently affecting respondents is a chemical / industrial accident, and in West Virginia disasters tend to be floods. The cross tab included in the above table is statistically significant at better than a 95% level of confidence, and has a Pearson $\chi 2$ value = 12.78 (df = 6, n = 1138), with an effect size (eta) η = .11.

Table 5.10: Plan for What to Take in an Evacuation by State of Residence

Plan for What to Take in Evacuation	State of Residence							
	CA	FL	LA	NC	MO	TX	WV	**Total**
Yes	64.5 (118)	60.8 (110)	87.3 (172)	48.1 (50)	47.2 (59)	72.1 (189)	44.4 (44)	64.5 (742)
No	35.5 (65)	39.2 (71)	12.7 (25)	51.9 (54)	52.8 (66)	27.9 (73)	55.6 (55)	35.5 (409)
Total	100.0 (183)	100.0 (181)	100.0 (197)	100.0 (104)	100.0 (125)	100.0 (262)	100.0 (99)	100.0 (1151)

When we compare plans for what to take in the event of an evacuation, we find results similar to Table 5.9. Table 5.10 reveals that residents of Louisiana are most likely to have a plan for what to take in an evacuation (87.3%), compared to persons with disabilities (64.5%) in all locations. Consistent with Table 5.9, California (64.5%), Florida (60.8%) and Texas (72.1%) fall at or slightly higher than the average. And, again residents with disabilities in North Carolina (48.1%), Missouri (47.2%) and West Virginia (44.4%) have the lowest frequency of planning for what to take if they evacuate. These differences among states are consistent with differences in the likelihood of a household developing a plan for what to take in an evacuation by hazard type. Residents of Florida, Louisiana, and Texas are most vulnerable to hurricanes, and those households vulnerable to hurricanes are the most likely to have a plan for what to take on the evacuation. California is vulnerable to wild fires, and over two-thirds of respondents residing in this state have a plan regarding items to take. Missouri and West Virginia are most vulnerable to floods including flash floods, and residents of these states are the least likely to have a plan of the type examined here. Residents of the central part of North Carolina experienced a hazardous waste fire and gas release in 2006, and again their likelihood of household planning related to what to take is lowest among the states surveyed. The cross tab in this table is highly statistically significant at better than a 99.9% level of confidence, and has a Pearson $\chi 2$ value = 98.47 (df = 6, n = 1151), with a substantial effect size (eta) η = .29.

Table 5.11: Plan for What to Take in an Evacuation by Hazard Type

Household Evacuation Plan	Hazard Type				
	Hurricane	Wildfire	Flooding	Chemical/ industrial	**Total**
Yes	73.6 (471)	64.5 (118)	46.0 (103)	48.1 (50)	64.5 (742)
No	26.4 (169)	35.5 (65)	54.0 (121)	51.9 (54)	35.5 (409)
Total	100.0 (640)	100.0 (183)	100.0 (224)	100.0 (104)	100.0 (1151)

Table 5.11 reveals large differences in household preparedness by type of hazard. Study findings reveal that at least two-thirds of respondents residing in areas vulnerable to hurricanes and wildfires have a plan for what to take during an evacuation, while fewer than half of respondents in areas with recent flooding or chemical/industrial disasters have such a plan. Residents in hurricane-prone areas are over 50% more likely to have a plan (73.6%) than are the residents in flood-prone areas (46.0%). This difference may be because the need to evacuate away from areas with hurricanes and wildfires often involves large numbers of households, so that residents of these areas are more likely to understand the potential need to evacuate. Floods and chemical / industrial accidents are more likely than hurricanes and wildfires to have a more limited geographical area of impact, involving fewer households. For any given location, floods and industrial accidents have a lower annual rate of occurrence than do hazards such as hurricanes and wildfires. As discussed under Table 5.10, states differ widely in the likelihood that persons with disabilities and their households will have a plan for what to take with them in an evacuation. Because certain states are more vulnerable to one or another type of hazard, the same factors that lead households to develop a plan for what to take may be at work for both geographic location and type of hazard. The cross tab in this table is highly statistically significant at better than a 99.9% level of confidence, and has a Pearson $\chi 2$ value = 68.88 ($df = 3$, $n = 1151$), with a substantial effect size (eta) $\eta = .25$.

Table 5.12: Knowledge of Public Shelter by State of Residence

Knowledge of Public Shelter	State of Residence							
	CA	FL	LA	NC	MO	TX	WV	**Total**
Yes	39.6 (72)	65.7 (119)	53.3 (1040	49.5 (52)	28.0 (35)	41.2 (106)	33.7 (32)	45.6 (520)
No	60.4 (110)	34.3 (62)	46.7 (91)	50.5 (53)	72.0 (90)	58.8 (151)	66.3 (63)	54.4 (620)
Total	100.0 (182)	100.0 (181)	100.0 (195)	100.0 (105)	100.0 (125)	100.0 (257)	100.0 (95)	100.0 (1140)

A household's knowledge of a specific public shelter for use during an evacuation is strongly influenced by the policies of state government in announcing the location of such a shelter. Some states, such as Florida, announce the location of these shelters during both non-disaster and disaster periods. Other states, such as Louisiana, will announce the location of public shelters only in the time period directly preceding a hurricane. However, not everyone may be aware of the location of a public shelter, even when that information is made available. Table V1.12 looks at knowledge of public shelters by state and reveals that with the exception of Florida and Louisiana, the majority of respondents do not know where public shelters are located. Approximately 50.5% of North Carolina, 58.8% of Texas, 60.4% of California, 66.3% of West Virginia, and 72.0% of Missouri residents with disabilities do not know where public emergency shelters are located in their areas. Only Florida residents have a high likelihood of knowing where public shelter are located, with nearly two-thirds (65.7%) of these respondents reporting such knowledge. Given that from one-third to two-thirds of respondents report not having knowledge of shelter location, this aspect of household planning ranks the lowest among our indicators. The cross tab in this table is highly statistically significant at better than a 99.9% level of confidence, and has a Pearson $\chi 2$ value = 60.65 (df = 6, n = 1140), with a substantial effect size (eta) η = .23.

Table 5.13: Knowledge of Public Shelter by Hazard Type

Knowledge of Public Shelter	Hazard Type				
	Hurricane	Wildfire	Flooding	Chemical/ Industrial	**Total**
Yes	52.0 (329)	39.6 (72)	30.5 (67)	49.5 (52)	45.6 (520)
No	48.0 (304)	60.4 (110)	69.5 (153)	50.5 (53)	54.4 (620)
Total	100.0 (633)	100.0 (182)	100.0 (220)	100.0 (105)	100.0 (1140)

Table 5.13 looks at knowledge of public emergency shelters by type of hazard. Findings indicate that in hurricane-prone areas, 52.0% of the residents know of a public shelter. In areas prone to floods, few (30.5%) respondents reported knowledge of a public shelter. These results are consistent with the relatively high percentage of respondents in hurricane areas (73.6%) with a plan for what to take on an evacuation, and the lower percentages (46.0%) residing in flood-prone areas with a plan for supplies needed on an evacuation (Table 5.10). In Table 5.14 a similar pattern is seen, with residents in hurricane areas most likely to have a plan to stockpile necessary medications, and flood-prone areas with the lowest percentages of those with plans to stockpile medications. The cross tab in this table is highly statistically significant at better than a 99.9% level of confidence, and has a Pearson $\chi 2$ value = 34.04 (df = 3, n = 1140), with an effect size (eta) η = .17.

Table 5.14: Plan to Stockpile Medications by State of Residence

Plan to Stockpile Medications	State of Residence							
	CA	FL	LA	NC	MO	TX	WV	**TOTAL**
Yes	76.4 (81)	91.9 (114)	87.7 (121)	76.4 (42)	69.3 (61)	81.5 (159)	70.8 (51)	80.8 (629)
No	23.6 (25)	8.1 (10)	12.3 (17)	23.6 (13)	30.7 (27)	18.5 (36)	26.4 (19)	18.9 (147)
Total	100.0 (106)	100.0 (124)	100.0 (138)	100.0 (55)	100.0 (88)	100.0 (195)	100.0 (72)	100.0 (778)

Table 5.14 looks at the relationship between stockpiling a supply of vital medications and the state of residence for which the person with a disability resides. Overall the numbers of persons with a plan to stockpile medications is high at 80.8%. Findings by state reveal some consistency with other indicators, such as knowledge of an evacuation destination and knowledge of the location of a public emergency shelter. Again, Florida (91.9%) and Louisiana (87.7%) rank the highest in terms of numbers of residents with disabilities with plans for stockpiling medications in the event of a disaster. West Virginia and Missouri have the lowest rates of households with plans to stockpile medications at 70.8% and 69.3%, respectively. The cross tab in this table is highly statistically significant at better than a 99.9% level of confidence, and has a Pearson $\chi 2$ value = 46.41 (df = 12, n = 778), with an effect size (eta) η = .20.

Table 5.15: Plan to Stockpile Medications by Hazard Type

Plan to Stockpile Medications	Hazard Type				
	Hurricane	Wildfire	Flooding	Chemical/ Industrial	**Total**
Yes	86.2 (394)	76.4 (810)	70.0 (112)	76.4 (42)	80.8 (629)
No	13.8 (63)	23.6 (25)	28.8 (46)	23.6 (13)	18.9 (147)
Total	100.0 (457)	100.0 (106)	100.0 (160)	100.0 (55)	100.0 (778)

Table 5.15 shows the association between hazard type and the likelihood that households have a plan to keep an available supply of vital medications. Findings reveal a similar pattern with other household preparedness indicators with respondents reporting the highest numbers with plans to stockpile vital medications in hurricane-prone areas (86.2%) and the lowest numbers in flood-prone areas (70.0%). This pattern is the same as in the previous Tables 5.11 and 5.13, which reveal the highest levels of preparedness in states with hurricanes and the lowest levels of preparedness in states with floods as their primary hazard type. The cross tab in this table is highly statistically significant and has a Pearson $\chi 2$ value = 25.50 (df = 6, n = 778), with an effect size (eta) η = .18 and (phi) Φ = .19.

Household Preparedness by Social Support and Organizational Involvement

In this section, household preparedness indicators were measured by cross tab analysis with indicators for level of social and organizational support and connectedness. This table and subsequent tables in the remainder of the planning preparedness section examine the influence of the social networks of respondents. These networks and their social support are made up of either individuals or organizations and involve either non-disaster or disaster contexts. Social support was measured by a respondent's assessment that he/she is likely to receive general support from a personal social network during a disaster situation.

Table 5.16: Knowledge of Specific Evacuation Destination by Social Support in Actual Disaster

Knowledge of Specific Evacuation Destination	Respondent Receives General Family/Friends Support During Disasters				
	Strongly Agree	Agree	Disagree	Strongly Disagree	**Total**
Yes	67.5 (347)	56.3 (262)	45.1 (32)	31.8 (14)	59.9 (655)
No	32.5 (167)	43.7 (203)	54.9 (39)	68.2 (30)	40.1 (439)
Total	100.0 (514)	100.0 (465)	100.0 (71)	100.0 (44)	100.0 (1094)

Table 5.16 contains the cross tab for the association between having a specific destination for evacuation and self-reported adequacy of social support from family, friends, or neighbors during a recent disaster. Findings suggest a strong direct relationship between social support during a disaster and having a specific evacuation destination as part of a household emergency plan. Those respondents who strongly agree that they receive adequate social support are the most likely to state that they have a specific destination planned in case of an evacuation (67.5%). Those respondents who strongly disagree with the statement that they receive adequate support during the recent disaster are least likely to have a specific destination as part of evacuation planning (68.2%). The cross tab in this table is highly statistically significant and has a Pearson $\chi 2$ value = 35.78 (df = 3, n = 1094), with an effect size (eta) η = .18.

Table 5.17: Plan for What to Take in an Evacuation by Adequate Social Support

Plan for What to Take in an Evacuation	Respondent Receives General Family/Friends Support During Crises				
	Strongly Agree	Agree	Disagree	Strongly Disagree	**Total**
Yes	72.1 (375)	58.1 (273)	65.3 (47)	50.0 (22)	64.8 (717)
No	27.9 (145)	41.9 (197)	34.7 (25)	50.0 (22)	35.2 (389)
Total	100.0 (520)	100.0 (470)	100.0 (72)	100.0 (44)	100.0 (1106)

Table 5.17 examines the adequacy of personal social support in a crisis for those with and without recent disaster experience and having a plan for what the respondent and their household would take with them in an evacuation. The results of the cross tab displaying in Table 5.17 show a direct, positive relationship between social support and having a plan for what to take during an evacuation. While 72.1% of those who strongly agree that social support is adequate during a crisis have an evacuation plan which specifies what will be taken along on the evacuation, only 50% of those who strongly disagree that their social support is adequate have such an evacuation plan. This pattern of influence of social support on evacuation planning is similar to the pattern in Table 5.16. Adequate social support during a crisis from family, friends, and neighbors again is shown to be associated with a reduction in disaster vulnerability for older persons and persons with disabilities and their households. Because evacuating without important supportive devices and equipment can reduce independent functioning and result in elevated levels of emotional distress, social support is shown to promote coping in disasters. The cross tab in this table is highly statistically significant and has a Pearson $\chi 2$ value = 25.73 (df = 3, n = 1096), with an effect size (eta) η = .15.

Table 5.18: Plan for What to Take in an Evacuation by Actual Organizational Support Received in Recent Disaster

Plan for What to Take in an Evacuation	Organizational Support Received in Recent Disaster						
	Church or Faith-based Group	Civic group, i.e., Rotary	Fire or Police Dept	State or Federal Gov Agency	Local Health Org	No help-Any Org	**Total**
Yes	77.4 (106)	71.4 (20)	72.6 (77)	83.8 (186)	76.0 (38)	68.8 (170)	(597)
No	22.6 (31)	28.6 (8)	27.4 (29)	16.2 (36)	24.0 (120)	31.2 (77)	(193)
Total	100.0 (137)	100.0 (280)	100.0 (106)	100.0 (222)	100.0 (500)	100.0 (247)	(790)

Respondents were asked "when there was an emergency or disaster in your community in the past several years, did you get any help from any of the following types of organizations?" Table 5.18 shows the relationship between help and support received in a recent disaster from different types of organizations and the likelihood respondents have a plan for what they would take with them if an evacuation was needed. Findings indicate that those who did receive help from an organization were more likely (71.4-83.8%) to have a plan for what to take in an evacuation than those who received no help from an organization (68.8%). Respondents with recent disaster experience were most likely to receive help from state or federal government agencies (83.8%), church or faith-based groups (77.4%) or local health organizations (76.0%). Statistical significance was only indicated for receiving help from a church or faith-based organization and a state or federal government agency. The cross tab for membership or volunteering for a church or faith-based group in Table 5.19 is highly statistically significant at better than a 99% confidence level, and has a Pearson $\chi 2$ value = 6.96 (df = 1, n = 912), with an effect size (eta) η = .09. The cross tab for membership or volunteering for a state or federal government agency in Table 5.18 is highly statistically significant and has a Pearson $\chi 2$ value = 34.89 (df = 1, n = 912), with an effect size (eta) η = .20.

Table 5.19: Knowledge of Public Shelter by Adequate Social Support

Knowledge of Public Shelter	Respondent Receives General Family/Friends Support During Crises				
	Strongly Agree	Agree	Disagree	Strongly Disagree	**Total**
Yes	49.4 (252)	45.1 (212)	28.2 (20)	27.3 (12)	45.3 (496)
No	50.6 (258)	54.9 (258)	71.8 (51)	72.7 (32)	54.7 (599)
Total	100.0 (510)	100.0 (470)	100.0 (71)	100.0 (44)	100.0 (1095)

Table 5.19 shows the relationship between adequate social support in a crisis for those with and without recent disaster experience and a respondent's likelihood of knowing about a public shelter as part of household emergency planning. Findings indicate that respondents that report adequate social support, in general, are more likely to know the location of public shelters in their area. For those who strongly agree that they receive adequate help and support, 49.4% of them know the location of a public emergency shelter, compared to only 27.3% of those who strongly disagree with the statement that they receive adequate help and support. The results from this table are consistent with the important role that social support plays in reducing the vulnerability of people to disasters, partly through evacuation and avoidance of injury or illness during a disaster such as a hurricane, chemical / industrial accident, or wild fire. The cross tab for Table 5.19 is highly statistically significant and has a Pearson $\chi 2$ value = 17.67 (df = 3, n = 1095), with an effect size (eta) η = .13.

Table 5.20: Plan to Stockpile Medications by Social Support

Plan to Stockpile Medications	Respondent Receives General Family/Friends Support during Crises				
	Strongly Agree	Agree	Disagree	Strongly Disagree	**Total**
Yes	88.0 (307)	78.0 (244)	78.9 (45)	54.5 (18)	81.6 (614)
No	11.7 (41)	21.7 (68)	21.1 (12)	45.5 (15)	18.1 (136)
Total	100.0 (349)	100.0 (313)	100.0 (57)	100.0 (33)	100.0 (752)

Planning for a supply of available medication is a critical part of any evacuation plan, for individuals that rely on daily vital medication. Planning for medication is comparable in importance to plans for other kinds of supplies that a household will take with them during an evacuation. This cross tab table examines the influence of receiving adequate support from friends, family, and neighbors in a personal crisis on having a plan for medication during evacuation. Just as with earlier tables (5.16 and 5.17), this table shows that adequate personal social support facilitates planning for an available supply of medication. Eighty-eight percent of respondents who strongly agree that they receive adequate social support also have responded that they or someone in their household has a plan to keep an available supply of medication. Only 54.5% of respondents who strongly disagree with the statement have a household plan for a medication supply in an evacuation. Social support may be mobilized by respondents to help them obtain an adequate supply of medication through provision of transportation, money, and time needed to visit with physicians and pharmacists who are the providers of prescription medication. Also, families, friends, or neighbors may help people to develop a realistic plan for a supply of needed prescription medications for an evacuation lasting at least a few days. Finally, family members themselves may develop and carry out plans to keep an available supply of vital medications for the respondent. Though around 80% of all respondents who use vital medications have a plan for medication, only about one-half of those without social support have such a plan. It is also important to note that 20% of respondents have no plan for vital and needed daily prescription medications during an evacuation, and it is unlikely that public shelters will have such a supply in evacuation conditions. The cross tab for Table 5.20 is highly statistically significant and has a Pearson $\chi 2$ value = 29.52 (df = 6, n = 752), with an effect size (eta) η = .19.

Table 5.21: Plan to Stockpile Medications by Organizational Support

Plan to Stockpile Medications	Total voluntary groups, with 3 greater			
	1	2	2	**Total**
Yes	57.6 (254)	74.0 (94)	64.9 (50)	61.7 (398)
No	42.4 (187)	26.0 (33)	35.1 (27)	38.3 (247)
Total	100.0 (441)	100.0 (127)	100.0 (77)	100.0 (645)

This contingency table focuses on the influence of support and help from organizations during an emergency or disaster, on the likelihood of having a plan to keep an available supply of prescription medications. The results in this table are consistent with those of Table 5.17, in which help from church / faith-based groups and especially state and federal government agencies was associated with the highest likelihood of having a household plan for what to take during an evacuation. In the present table, those respondents who received help form a state or federal government agency are very likely (88.3%) to have a medication supply plan. Those who report being helped by a civic group such as a rotary club were least likely (78.9%) to

report a plan for a supply of medications. For those helped by all other types of organizations, at least eighty percent reported a plan for an available supply of medications. It is not clear why help from a civic organization is associated with a low percentage of respondents having a medication supply plan for evacuation. This discrepancy was not statistically significant, however, and the effect size (eta) $\eta = 0$, so this difference is likely due to random error of some type. Support from a state of federal governmental agency in an emergency, however, is very important for facilitating household planning for medication supplies in an evacuation. Governmental organizations usually have a mandate to help people in a disaster, and many of these organizations are emergency management organizations with a substantial capacity for disaster services for people. Governmental organizations have the greatest potential for helping persons with disabilities to plan for evacuation and an adequate supply of vital medications. The cross tab for Table 5.21 for those who have received help from a state or federal government agency is highly significant at better than a 99% level of confidence and has a Pearson $\chi 2$ value = 8.80 ($df = 2$, $n = 650$), with an effect size (eta) $\eta = .10$.

Table 5.22: Plan to Stockpile Medications by Social Support in a Disaster

Plan to Stockpile Medications	Respondent Receives General Family/Friends Support during Disasters				
	Strongly Agree	Agree	Disagree	Strongly Disagree	**Total**
Yes	90.5 (181)	87.5 (105)	75.7 (28)	73.3 (22)	86.8 (336)
No	9.0 (18)	12.5 (15)	24.3 (9)	26.7 (8)	12.9 (50)
Does not apply	.5 (1)	.0 (0)	.0 (0)	.0 (0)	.3 (1)
Total	100.0 (200)	100.0 (120)	100.0 (37)	100.0 (30)	100.0 (387)

Just as social support during a personal crisis (Table 5.20) is positively related to having a plan for an available supply of medication, so is social support during a disaster, as shown in this table. Those respondents who strongly agree that that received help and support during a disaster from family, friends, and neighbors are very likely (90.5%) to report a household plan for keeping an available supply of vital medications. Only 73.3% of those who strongly disagree, with the statement that they received social support in a disaster, have a medication plan. Having social support in a disaster from family, friends, and neighbors is positively and directly related to having a medications supply plan for evacuation. If a respondent has received social support and help in a disaster, it is likely that they will have also received help with planning for a medications supply in an evacuation. A household member may have planned for the respondent, and social support is important in having the resources to maintain an available supply of medication. Prescription medication is relatively costly to obtain, in terms of money, time, and transportation. For those without adequate health care insurance, medication can be

extremely expensive or inaccessible for other reasons. A high level of compliance to instructions from physicians and other health and mental health providers is required if multiple medications are needed, and social support can help improve compliance to providers' instructions concerning medications. Finally, part of the help the respondents received from family, friends, and neighbors could involve medication management, particularly for respondents who need medication to maintain functioning. The cross tab for Table 5.22 for having a medication plan by social support from family, friends, or neighbors in a disaster is statistically significant at greater than a 95% level of confidence, and has a Pearson $\chi 2$ value = 12.92 (df = 6, n = 387), with an effect size (eta) η = .16.

Table 5.23: Knowledge of Public Shelter by Organizational Membership

Knowledge of Public Shelter Organization	Total voluntary groups			
	1	2	3 or greater	**Total**
Yes	46.2 (204)	56.5 (70)	56.4 (44)	49.4 (318)
No	53.8 (238)	43.5 (54)	43.6 (34)	50.6 (326)
Total	100.0 (442)	100.0 (124)	100.0 (78)	100.0 (644)

This table and cross tabs show that organizational memberships or volunteer status has a positive and direct effect on likelihood that respondents know the location of a public emergency shelter in their area. The evidence for this comes especially from membership / volunteering in community charitable services groups, local civic organizations, the unspecified (other) category of organizations, and among those respondents with no organizational memberships. The percentage of those respondents who are members of a community charitable services group and who know where a public emergency shelter is located is 56.2%. The percentage of those respondents who are members of a local civic organization and who know where a public emergency shelter is located is 56.6%. For members of the "other" category of organizations, 56.4% know the location of a public shelter. Some of the other category mentioned by respondents are clubs for the deaf, sororities, universities, and service clubs focused on celebration of a specific holiday. For those respondents with no organizational memberships, the percentage of respondents who know the location of a public emergency shelter is only 40.4%. Each of the above memberships, in community charitable services groups, local civic organizations, as well as the other category of organizations, increases the likelihood that a respondents knows the location of a public shelter by roughly the same number of percentage points, from 40.4% to over 56.2%. In fact, membership in any type of organization is associated with an increase in the likelihood of knowing the location of a shelter, though the increase is not statistically significant for membership in a church / faith-based group, a local seniors center, or a sports or other recreation group. Organizational memberships or volunteer positions represent greater social involvement and participation of respondents, and generally lead to increased access to social resources both tangible and intangible (information, emotional support). The cross tab for Table 5.23 for those who are members or volunteer for a community charitable services group is statistically significant at better than a 99% level of confidence and has a

Pearson $\chi 2$ value = 7.30 (*df* = 1, *n* = 1103), with an effect size (eta) η = .08. The cross tab for Table 5.23 for those who are members or volunteer for the other category of organizations is statistically significant at better than the 99% level of confidence and has a Pearson $\chi 2$ value = 7.32 (*df* = 1, *n* = 1103), with an effect size (eta) η = .08. The cross tab for Table 5.23 for those who are not members or volunteers for any organization is statistically significant at better than the 99% level of confidence and has a Pearson $\chi 2$ value = 9.47 (*df* = 1, *n* = 1103), with an effect size (eta) η = .09.

Table 5.24: Knowledge of Public Shelter by Total Number of Memberships

Knowledge of Public Shelter	Organization Total							
	0	1	2	3	4	5	6	**Total**
Yes	40.6 (203)	46.2 (204)	56.5 (70)	56.1 (23)	60.9 (14)	46.2 (6)	100.0 (1)	45.5 (521)
No	59.4 (297)	53.8 (238)	43.5 (54)	43.9 (18)	39.1 (9)	53.8 (7)	.0 (0)	54.5 (623)
Total	100.0 (500)	100.0 (442)	100.0 (124)	100.0 (41)	100.0 (23)	100.0 (13)	100.0 (1)	100.0 (1144)

This table examines the influence of number of organizational memberships of a respondent on the likelihood that the respondent will know of the location of a public shelter in their local area. Though the above table (Table 5.24) has shown that membership or volunteering in particular types of organizations increases the likelihood that a respondent knows the location of a public shelter, it is not clear if this effect is additive. It is possible that membership in two or more organizations confers no additional increase in likelihood of knowing a public shelter over membership in a single organization. The present crosstab shows that there is a direct and additive effect for membership in each additional organization. Though a lack of memberships and volunteering in an organization has the lowest likelihood of a respondent knowing of a public shelter (40.6%), membership in 1 organization raises this percentage to 46.2% of respondents. A second membership raises the percentage to over fifty-six percent of respondents, though this percentage is close to the percentage for three memberships. For those with 4 memberships, the percentage of respondents knowing the location of a local shelter is 60.9%. These results are consistent with the results in Table 5.24, because memberships in either a community charitable services group, a local civic organization, or a local seniors center is often accompanied by a membership in at least one other organization. For those respondents who are members of any of these 3 types of organizations, over 90% are also members of at least one other organization. The cross tab for this table is statistically significant at better than the 99% level of confidence and has a Pearson $\chi 2$ value =16.16 (*df* = 6, *n* = 1144), with an effect size (eta) η = .12.

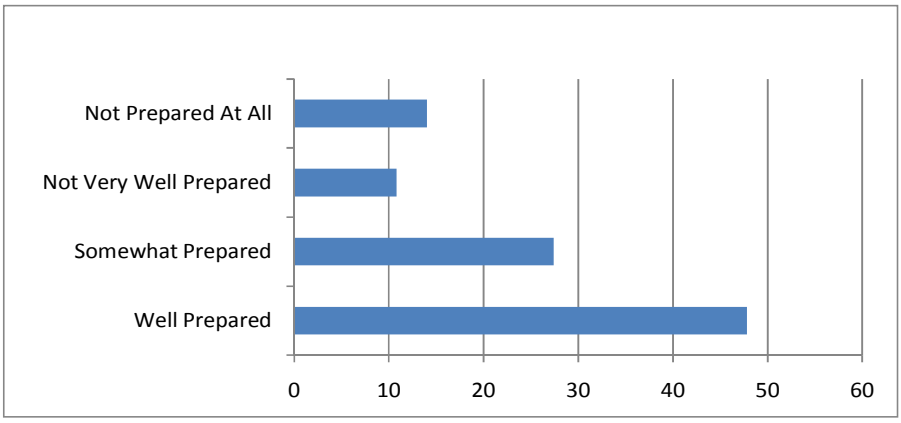
VI. FINDINGS: CAPACITY TO MANAGE HOUSEHOLD NEEDS DURING A DISASTER

As distinct from general household preparedness for disasters and disaster evacuations, capacity to manage one's own situation during an actual disaster incident is a critical evaluative issue for this project. Toward understanding the issue of capacity to manage personal needs during a disaster, we focus our attention in this section on two key issues:

1. Ability to evacuate effectively/ability to cope with dislocation
2. Ability to shelter in place effectively/ability to cope with protecting yourself

Respondents were asked about their ability to evacuate their homes during a disaster situation. Specifically, respondents were asked the following: "In terms of personal resources, how prepared are you to take care of yourself if you had to leave your home for several days because of a disaster? Are you...not at all prepared, you don't have the resources to stay away from home; not very well prepared, you couldn't make it more than a day or two away from home; somewhat prepared, you could make it a few days away from home, but not much longer; or well prepared, you could make it for a week or more away from home without major problems?

Figure 6.1: Frequency Distribution –
All Respondents: Prepared to Leave Home in Case of Disaster



At first glance, Figure 6.1 would seem to indicate that respondents in this study are generally prepared to leave home in case a disaster evacuation is ordered. However it is important to note the timeframe in the response options: respondents were specifically asked whether they were able to meet their own needs for a range of one or two days, several days, and a week or more. While about 47% say they are well-prepared for being dislocated for a week or more, the more salient issue to note is that about 53% of all respondents report the capacity to manage their needs for several days – or less. Indeed, about 25% of respondents reported they were either not at all prepared or not very well prepared to evacuate – meaning they could not manage their needs for a day or two at the most, or not at all. One-quarter of respondents represents a

substantial minority of respondents who are not adequately prepared to leave home, but of course it is worth examining the pattern of how these responses vary by several different respondent characteristics.

For respondents, the impact of their disability on activities of daily living is associated with large differences in the pattern of reported preparedness (Table 6.1). Not surprisingly, households with greater impact on activities of daily living were less prepared for evacuation. For those respondents who reported no disability, only 3.2% were not prepared at all, while 72.6% reported they were well prepared for an evacuation. However, for households with significant impact on ADLS, 23.7% report that they are not at all prepared, while only 30.2% reported they were very well prepared. The effect size for this crosstab is moderately large, with a Pearson's r = - 0.34. For the chi square statistic, $\chi 2$ = 150.88, (df = 9, n = 1091.), and this is highly significant at better than the 99.9% confidence level.

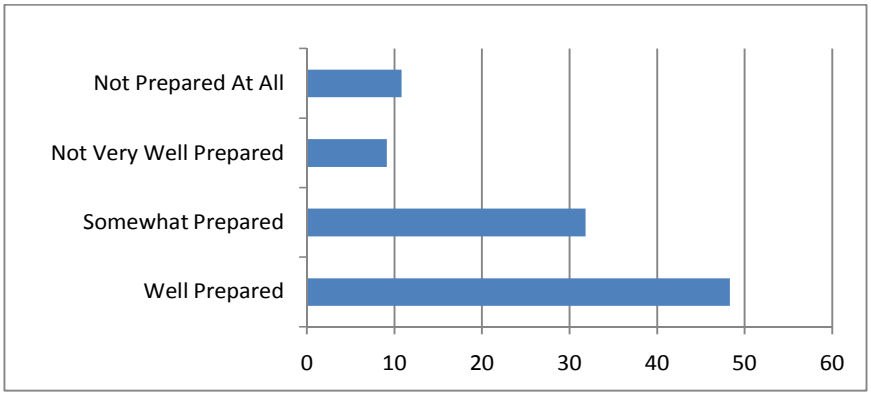
Table 6.1 Evacuation Capacity by ADL Assessment

Evacuation Capacity Assessment	Reported Limitation in Activities per ADL			
	No Disability Reported	Minimal Impact	Moderate Impact	Significant Impact
Not Prepared At All	3.2 (11)	12.2 (28)	17.9 (40)	23.7 (69)
Not Very Well Prepared	5.8 (20)	11.4 (26)	14.7 (33)	13.7 (40)
Somewhat Prepared	18.4 (64)	30.6 (70)	31.3 (70)	32.3 (94)
Well Prepared	72.6 (252)	45.9 (105)	36.2 (81)	30.2 (88)
Total	100.0 (347)	100.0 (229)	100.0 (224)	100.0 (291)

Chi Square = 150.88, (9 d.f.), p < 0.001, Gamma = -.422
Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

Additionally, one can compare a respondent's evacuation capacity by the impact on his or her activities of daily living. In computing the odds ratio, a respondent with no disability present is 4.57 times more likely to be well prepared as opposed to those respondents who have some impact on their activities of daily living. (The odds ratio computation is 2.65:.58 when the ADL scores are collapsed into a single category of disability present and preparedness is dichotomized.) This clearly indicates that the general public has an advantage in the ability to evacuate as opposed to members of the disability community.

Figure 6.2: Frequency Distribution – All Respondents: Prepared to Shelter-in-Place



As Figure 6.2 indicates, respondents in this study are generally prepared to shelter-in-place in case of disaster. A large majority of respondents reported that they are either somewhat prepared or well prepared to shelter-in-place without assistance. However 19.4% reported they were either not at all prepared or not very well prepared to shelter-in-place. Nearly 20 percent of respondents represent a substantial minority of respondents who are not adequately prepared to shelter on their own.

Table 6.2: Shelter-in-Place Capacity by ADL Assessment

Shelter-in-Place Capacity Assessment	Reported Limitation in Activities per ADL			
	No Disability Reported	Minimal Impact on ADL	Moderate Impact on ADL	Significant Impact on ADL
Not Prepared At All	1.7 (6)	9.1 (21)	12.8 (29)	19.8 (58)
Not Very Well Prepared	3.2 (11)	9.5 (22)	11.5 (26)	13.3 (39)
Somewhat Prepared	21.5 (74)	37.2 (86)	36.7 (83)	34.5 (101)
Well Prepared	73.5 (253)	44.2 (102)	38.9 (88)	32.4 (95)
Total	100.0 (344)	100.0 (231)	100.0 (226)	100.0 (293)

Chi Square = 152.25, (9 d.f.), p < 0.001, Gamma = -.429
Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

When the pattern of preparedness to shelter in place during a disaster is examined by level of impact of disability on ADL, a similar pattern emerges. Persons with more significant limitations are more likely to indicate low capacity for independent sheltering in place and for independent evacuation. Table 6.2 indicates that for those with no disability only 1.7% report being not prepared at all, while 73.5% report being well-prepared to shelter in place. However, for those respondents whose disability has a significant impact on their activities of daily living, 19.8% report being not prepared at all, and only 32.4% report being well-prepared. The cross tab for this table is statistically significant at better than the 99.9% level of confidence and Pearson $\chi 2$ value =152.25 (*df* = 9, *n* =1094), with an effect size (eta) η = 0.35.

When comparing a respondent's ability to shelter-in-place by the impact of his/her disability on his/her activities of daily living, there is also a similar result in the odds ratio. A respondent with no disability present is 4.56 times more likely to be well prepared as opposed to those respondents who have some impact on their activities of daily living. (The odds ratio computation is 2.78:.61 when the ADL scores are collapsed into a single category of disability present.). In essence, a respondent with no disability present is far more capable to shelter-in-place as opposed to those who report an impact on their activities of daily living.

Table 6.3 Shelter-in-Place Capacity by Total Disabilities

Shelter-in-Place Capacity Assessment	**Number of Disabilities**					
	0	1	2	3	4	5
Not Prepared At All	2.0 (7)	13.4 (53)	13.4 (31)	16.7 (18)	25.0 (10)	25.0 (3)
Not Very Well Prepared	3.7 (13)	9.1 (36)	13.0 (30)	12.0 (13)	27.5 (11)	8.3 (1)
Somewhat Prepared	21.5 (75)	36.4 (144)	36.4 (84)	42.6 (46)	25 (10)	25 (3)
Well Prepared	72.8 (254)	41.2 (163)	37.2 (86)	28.7 (31)	22.5 (9)	41.7 (5)
Total	100.0 (349)	100.0 (396)	100.0 (231)	100.0 (108)	100.0 (40)	100.0 (12)

Chi Square = 161.00, (15 d.f.), p < 0.001, Gamma = -.408
Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

Table 6.3 shows the pattern of household capacity to shelter-in-place by number of disabilities experienced in a single household. This table clearly shows that respondents with multiple disabilities within the household report a lower likelihood of being somewhat or well prepared to shelter in place up to a certain point. Once 5 disabilities are indicated, however, respondents report being better prepared to shelter-in-place, from 22.5 percent of households with 4

disabilities reported up to 41.7 percent of households with 5 disabilities reported. The cross tab for this table is statistically significant at better than the 99.9% level of confidence and has a Pearson $\chi 2$ value =161.00 (*df* = 15, *n* = 1,136), with an effect size (eta) ŋ = 0.34.

Table 6.4: Shelter-in-Place Capacity by Total Disabilities

Shelter-in-Place Capacity Assessment	Number of Disabilities			
	0	1	2	3 or more
Not Prepared At All	2.0 (7)	13.4 (53)	13.4 (31)	19.4 (31)
Not Very Well Prepared	3.7 (13)	9.1 (36)	13.0 (30)	15.6 (25)
Somewhat Prepared	21.5 (75)	36.4 (144)	36.4 (84)	36.9 (59)
Well Prepared	72.8 (254)	41.2 (163)	37.2 (86)	28.1 (45)
Total	100.0 (349)	100.0 (396)	100.0 (231)	100.0 (160)

Chi Square = 146.221, (9 d.f.), p < 0.001, Gamma = -.412
Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

When a category of 3 or more disabilities within a household is created by summing 3 categories, then the association between number of disabilities is shown to be an inverse or negative association (Table 6.4). The more disabilities in a household (3 or more) the less likely the household has a high capacity to shelter in place. Conversely, the more disabilities in a household, the more likely the household is to report being not prepared at all to shelter in place. The cross tab for this table is statistically significant at better than the 99.9% level of confidence and has a Pearson $\chi 2$ value =146.221 (*df* = 9, *n* = 1135), with an effect size (eta) ŋ = 0.34.

Respondents in households without a disability present are 4.45 more likely to report that they are well prepared to shelter-in-place. (The odds ratio computation is 2.67:.60 when the number of disabilities reported is collapsed into a single category of disability present versus no reported disability present in the household.) This suggests that households with one or more disabilities present are far more likely to lack the adequate preparation and resources to shelter-in-place effectively as opposed to those who do not report a person with a disability in their household.

Figure 6.3: Frequency Distribution –
All Respondents: Total Number of Voluntary Memberships

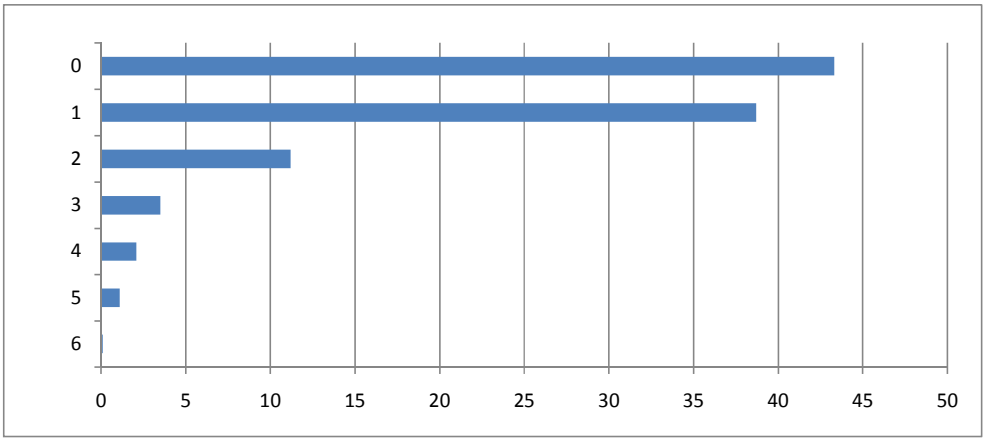


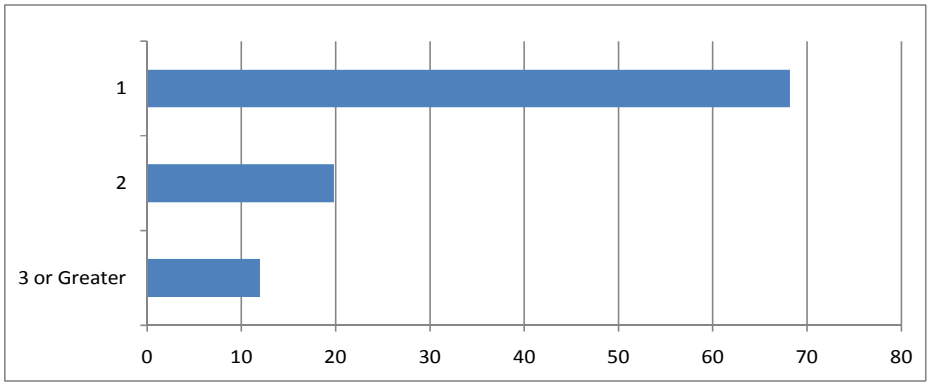
Figure 6.3 shows that while, nearly 45% indicate no voluntary memberships, a majority of respondents (59.2%) reported that they are a member of one or more voluntary associations. Table 6.5 shows the relationship between evacuation capacity and number of voluntary association memberships. Respondents who are members of only one organization are less likely than those who have multiple memberships to be well prepared in an evacuation. Those with only one membership are more likely to report being not at all prepared (13.7%) for an evacuation, compared to those with 2 or more voluntary memberships. The cross tab for Table 6.5 is statistically significant at better than the 99% level of confidence and has a Pearson $\chi 2$ value =28.76 (df = 15, n = 646), with an effect size (eta) η = 0.204.

Table 6.5: Evacuation Capacity by Total Number of Voluntary Memberships (1-6)

Evacuation Capacity Assessment	Number of Voluntary Memberships					
	1	2	3	4	5	6
Not Prepared At All	13.7 (60)	3.1 (4)	4.9 (2)	8.3 (2)	0 (0)	0 (0)
Not Very Well Prepared	9.8 (43)	5.5 (7)	7.3 (3)	4.2 (1)	7.7 (1)	0 (0)
Somewhat Prepared	28.7 (126)	24.2 (31)	22.0 (9)	29.2 (7)	15.4 (2)	0 (0)
Well Prepared	47.8 (210)	67.2 (86)	65.9 (27)	58.3 (14)	76.9 (10)	100.0 (1)
Total	100.0 (439)	100.0 (128)	100.0 (41)	100.0 (24)	100.0 (13)	100.0 (1)

Chi Square = 28.76, (15 d.f.), p < 0.017, Gamma = .327
Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

Figure 6.4: Frequency Distribution – All Respondents: Total Number of Voluntary Memberships with 3 or Greater



The positive, direct relationship between number of voluntary memberships and capacity to evacuate during a disaster is shown even more clearly when respondents with 3, 4, 5, and 6 voluntary association memberships are grouped together (Figure 6.4 and Table 6.6). Table 6.6 indicates that those respondents with multiple memberships 3 or greater (65.8%) are well prepared for evacuation compared to persons with only 1 voluntary membership (47.8%). This is also compared to 23.5% of persons with only 1 voluntary membership (versus 11.4% of those with 3 or more memberships) who indicate that they are not at all prepared or not very well prepared to evacuate independently. Those with much less likely to report being not at all

prepared, while these respondents are much more likely to report being very well prepared to evacuate. The cross tab for Table 6.6 is statistically significant at better than the 99.9% level of confidence and has a Pearson $\chi 2$ value =26.33 (*df* = 6, *n* = 646), with an effect size (eta) η = 0.20.

Table 6.6: Evacuation Capacity by Total Number of Voluntary Memberships (3 or Greater)

Evacuation Capacity Assessment	Number of Voluntary Memberships		
	1	2	3 or Greater
Not Very Well Prepared	9.8 (43)	5.5 (7)	6.3 (5)
Somewhat Prepared	28.7 (126)	24.2 (31)	22.8 (18)
Well Prepared	47.8 (210)	67.2 (86)	65.8 (52)
Total	100.0 (439)	100.0 (128)	100.0 (79)

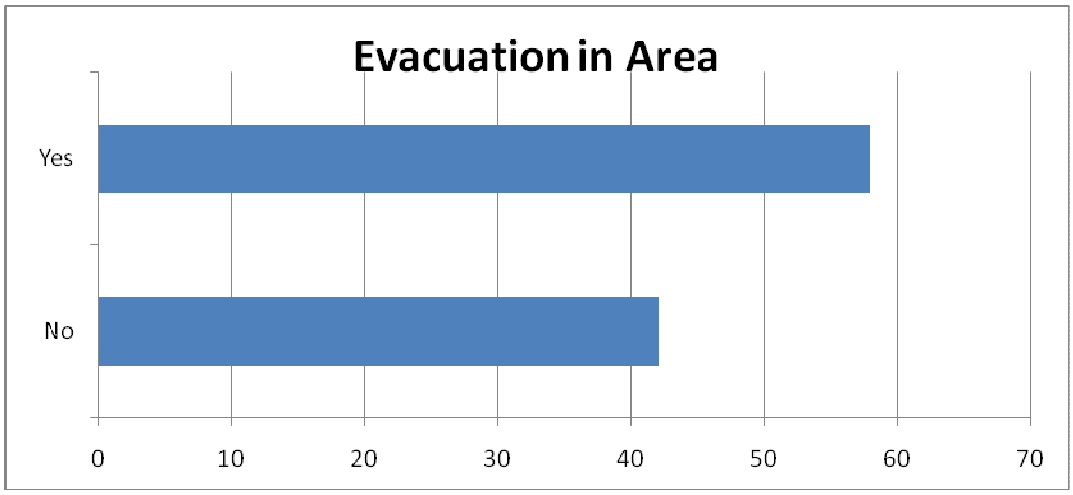
Chi Square = 26.33, (6 d.f.), p < 0.001, Gamma = .331
Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

VII. FINDINGS: DISASTER EVACUATION BEHAVIOR AND OUTCOMES

The prior two sections of this report considered indicators of household preparedness and assessments of the capacity for an individual or household to manage needs during a disaster (either during an evacuation or sheltering in place during that disaster). This section considers a variety of issues related to those who actually had a disaster incident in the immediate vicinity of their place of residence over the last several years, and thus, had to choose to evacuate or not. Respondents were asked a number of questions pertaining to actual disaster and evacuation experience.

First, all respondents were asked if they had experienced a disaster that resulted in an evacuation of their area of residence in the last several years (Figure 7.1), A total of 670 respondents (57.7%) in the sample indicated that there was a recent disaster that caused an evacuation in their area in the recent past (the last several years). These respondents were then asked several basic follow-up questions to assess the nature of that disaster evacuation situation: "Did you find out about the evacuation in time to be evacuated?", "How did you learn that an evacuation was taking place?", and "After the disaster was over, what was the single most important thing that made recovery difficult?"

Figure 7.1: Disaster with Evacuation Incident Occurring in Respondent's Area – All Respondents



A total of 463 respondents (39.8% of total and 69.6% of those with disaster experience) indicated they had evacuated in the recent disaster (Figure 7.2 below). For those with disaster/evacuation experience, respondents were asked "What was the single most important reason you or someone from your household decided to evacuate?", When you evacuated, where did you go?" "When you evacuated, did you have everything you needed in terms of key resources, such as access to medical care or safe shelter?", How did the evacuation go?", "What supports did you bring for yourself or another household member?", "In the weeks following your return home, would you say you were better off, worse off or about the same in terms of your health and physical well-being?" For those who did undergo evacuations, we examined their experience by the limitation on ADLs; capacity to shelter-in-place; number of disabilities; hazard type; number of memberships in volunteer organizations; disability; and

capacity to evacuate. The relationship between evacuation and capacity was the only one that was not statistically significant.

Figure 7.2: All Respondents with Actual Evacuation of Household

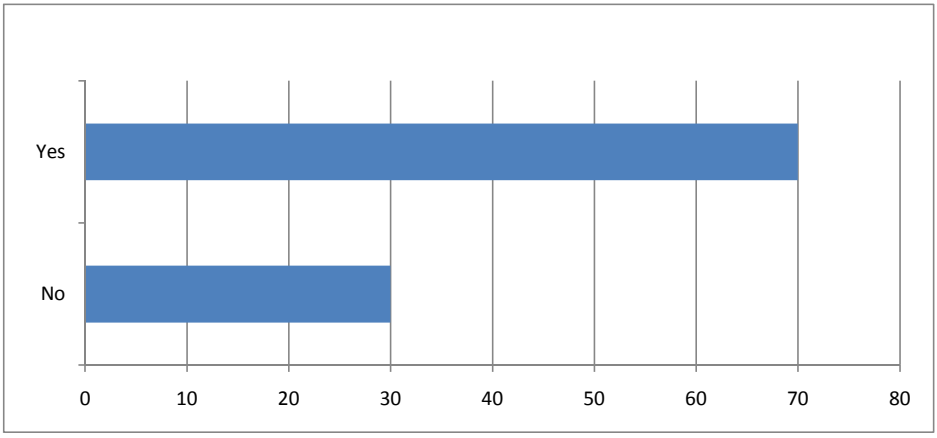


Table 7.1 displays the relationship between evacuation decision-making (whether or not someone chose to evacuate in a disaster) and disability limitations by ADLs. The data shows that respondents were more likely to evacuate as the limitation on ADLs increased. Those who reported no disabilities had the lowest percentage of evacuation (62%). Respondents with the most significant limitations in ADLs were almost 80% (76.2%) more likely to evacuate. The relationship is statistically significant with a chi square value of 9.57 with a 95% level of confidence ($p<.05$).

Table 7.1: Evacuation by ADL Assessment

Evacuation Capacity Assessment	Limitation in Activities per ADL			
	No Disability Reported	Minimal Impact on ADL	Moderate Impact on ADL	Significant Impact on ADL
Yes	62.0 (116)	68.9 (91)	72.6 (98)	76.2 (144)
No	38.0 (71)	31.1 (41)	27.4 (37)	23.8 (45)
Total	100.0 (187)	100.0 (132)	100.0 (135)	100.0 (189)

Chi Square = 9.57, (3 d.f.), p < 0.023, Gamma = -.196
Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

Table 7.2 explores the relationship between evacuation decision-making and capacity to shelter-in-place. Shelter-in-place assesses the extent to which respondents are prepared for an evacuation. Capacity to shelter-in-place independently is similar for those respondents who

were not well prepared with an almost 7% difference between those who were somewhat prepared and those who were not prepared at all. The average across these levels of lesser preparation is almost 76% which is 11% higher than those who are well prepared (65.2%). The relationship is statistically significant with a chi square value of 8.03 with a 95% level of confidence (p<.05).

Table 7.2: Evacuation by Shelter-in-Place Capacity

Respondents Choice to Evacuate	Shelter-in-Place Capacity Assessment			
	Not Prepared At All	Not Very Well Prepared	Somewhat Prepared	Well Prepared
Yes	79.0 (64)	75.9 (41)	72.3 (149)	65.2 (202)
No	21.0 (17)	24.1 (13)	27.7 (57)	34.8 (108)
Total	100.0 (81)	100.0 (54)	100.0 (206)	100.0 (310)

Chi Square = 8.03, (3 d.f.), p < 0.045, Gamma = .202
Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

Respondents were asked about their choices of either evacuating or staying at their home (sheltering-in-place). When looking at the odds ratio for the same, 1.55 respondents who reported that they were well prepared to shelter-in-place did not evacuate. (The odds ratio computation is .53:.34 when shelter-in-place preparedness are collapsed into two categories with those reporting they are well prepared versus those reporting being not prepared, not very well prepared and somewhat prepared). In essence, those who reported a greater capacity to shelter-in-place independently were more likely to shelter-in-place and not evacuate.

Table 7.3: Evacuation by Disabilities per Household with 3 or Greater

Respondents Choice to Evacuate	Disabilities per Household			
	No Disabilities	1 Disability	2 Disabilities	3 or Greater Disabilities
Yes	62.4 (118)	71.7 (165)	73.9 (102)	75.8 (75)
No	37.6 (71)	28.3 (65)	26.1 (36)	24.2 (24)
Total	100.0 (189)	100.0 (230)	100.0 (138)	100.0 (99)

Chi Square = 8.07, (3 d.f.), p < 0.045, Gamma = -.174
Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

Table 7.3 demonstrates the relationship between evacuation decision-making and number of disabilities. The data show that respondents with more disabilities are more likely to evacuate (75.8%). The likelihood of evacuation consistently increased with the number of disabilities. Respondents with no disabilities were the least likely to evacuate (62.4%). The relationship is statistically significant with a chi square value of 8.07 with a 95% level of confidence ($p<.05$).

When looking at the odds ratio, respondents who reported no disabilities in their household were less likely to evacuate during a time of disaster. Of the respondents who reported a disability in the household 1.65 were more likely to evacuate as opposed to other persons or households in the general public. (The odds ratio computation is 2.74:1.66 when those reporting disabilities in their household are collapsed into one column.) This suggests that those who report a disability in their household are far more willing to seek shelter in other places.

Table 7.4 shows the relationship between evacuation decision-making and type of hazard (hurricane, wildfire, flooding, or chemical/industrial). Respondents experiencing hurricanes were more than 82% more likely to evacuate. The reverse was true for flooding with 80.2% of respondents choosing not to evacuate. Wildfire respondents were almost 60% (57.1) likely to evacuate. Those who experienced chemical spills were about even, split between evacuating (48.2%) and not (51.2%). These strong results demonstrate how important hazard type is in deciding whether to evacuate. The relationship is statistically significant with a chi square value of 143.95 with a 99% level of confidence ($p<.01$).

Table 7.4: Evacuation by Hazard Type

Respondents Choice to Evacuate	**Type of Hazard**			
	Hurricane	Wildfire	Flooding	Chemical/ Industrial
Yes	82.0 (392)	57.1 (32)	19.8 (16)	48.2 (21)
No	18.0 (86)	42.9 (24)	80.2 (65)	51.2 (22)
Total	100.0 (478)	100.0 (56)	100.0 (81)	100.0 (43)

Chi Square = 143.95 (3 d.f.), p < 0.001, Gamma = .701
Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

Table 7.5 demonstrates the relationship between evacuation decision-making and the total number of memberships in volunteer organizations. Almost three-fourths (72.7%) of respondents who chose to evacuate belong to one volunteer organization; a little over one-half of respondents (53.3%) belong to two; and 60 percent of respondents who evacuated belong to three or more organizations. The data show that membership in volunteer organizations play an important role in evacuation decision-making with those with members more likely to evacuate. The relationship is statistically significant with a chi square value of 10.97 with a 99% level of confidence ($p<.01$).

Table 7.5 Evacuation by Total Voluntary Memberships with 3 or Greater

Respondents Choice to Evacuate	Number of Voluntary Memberships		
	1	2	3 or Greater
Yes	72.7 (186)	53.3 (40)	60.0 (24)
No	27.3 (70)	46.7 (35)	40.0 (16)
Total	100.0 (256)	100.0 (75)	100.0 (40)

Chi Square = 10.97 (2 d.f.), p < 0.004, Gamma = .311
Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

Table 7.6 assesses the relationship between evacuation decision-making and presence of disability in the household. The data show that respondents in households that indicate disability are 11% more likely to evacuate (73.1%) than those households without disabilities (62%). The relationship is statistically significant with a chi square value of 7.80 with a 99.9% level of confidence (p<.000). According to the odds ratio, those reporting disability in the household were 1.67 times more likely to evacuate than those not reporting a disability. (The odds ratio computation is 2.72:1.63).

Table 7.6: Evacuation by Presence of Disability

Respondents Choice to Evacuate	Presence of Disability	
	Disability Present	No Disability Present
Yes	73.1 (345)	62.0 (116)
No	26.9 (127)	38.0 (71)
Total	100.0 (472)	100.0 (187)

Chi Square = 7.80 (1 d.f.), p < 0.00, Lambda .000
Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

Most Important Reason for Evacuation

Respondents with evacuation experience were asked the most important reason for evacuating. Over 45% indicated they felt it was too dangerous to stay home, more than 30% indicated that they were simply following government evacuation warnings, and the remainder indicated following advice from friends or family, that they saw neighbors leaving or other reasons (Figure 7.3). Evacuation decision-making is evaluated in this section by limitations on ADLs; number of

disabilities; and by mobility and hearing impairment. Only the relationship between the most important reason to evacuate and mobility impairment was statistically significant.

Figure 7.3: All Respondents: MOST IMPORTANT Reason for Evacuation

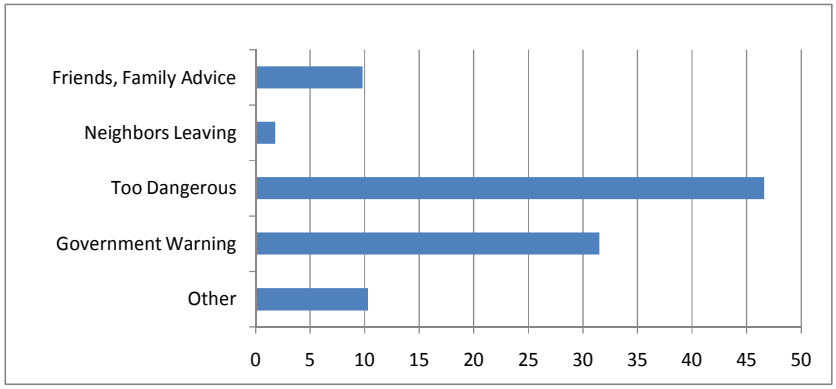


Table 7.7 shows the relationship between the reason for evacuation and mobility impairment. The greatest difference between respondents with and without mobility impairments was for those who cited danger as the most important reason for evacuating. Danger prompted 52.1% of those without a mobility impairment to evacuate, while it did so for 35.1% of those with mobility impairments. Respondents with mobility impairment were similar in their responses to evacuating due to danger (35.1%) and government warning (37.8%). The relationship is statistically significant with a chi square value of 13 with a 95% level of confidence ($p<.05$).

Table 7.7: MOST IMPORTANT Reason for Evacuation by Mobility Impairment

Reason For Evacuating	Mobility Impairment by Respondent or Household Member	
	No Impairment Present in HH	Impairment Present in HH
Friend, Family Advice	9.1 (28)	11.5 (17)
Neighbors Leaving	1.9 (6)	1.4 (2)
Too Dangerous	52.1 (161)	35.1 (52)
Government Warning	28.5 (88)	37.8 (56)
Other	8.4 (26)	14.2 (21)
Total	100.0 (309)	100.0 (148)

Chi Square = 13.006 (4 d.f.), p < 0.011, Lambda .010
Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

Evacuation Location

Respondents with recent disaster and evacuation experience were asked where they went when they evacuated. Nearly 50 percent went to homes of friends or family members. The remainder went to motels (23.3%), public shelters (7.8%), community shelters, such as church facilities (3.5%) and other (15.7%) locations (see Figure 7.4 below). The evacuation location is evaluated in this section by the limitation on ADLs; number of disabilities; hazard type; and number of memberships in volunteer organizations. The relationship between evacuation location and hazard type was the only one that was not statistically significant.

Figure 7.4: All Respondents: Evacuation Location

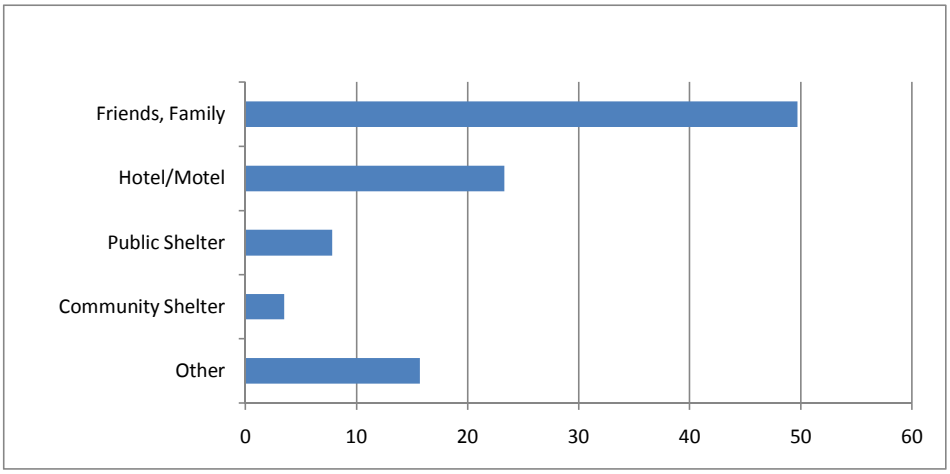


Table 7.8 demonstrates the relationship between evacuation location and presence of disability. The greatest difference was with those who decided to go to public shelters. Those with disabilities were much more likely to go to a public shelter (25.8%) than those without disabilities (7.8%). Respondents without disabilities (59.5%) were also more likely to evacuate to the homes of friends and family, compared to only 46.3% of those with disabilities. Disability made little difference between the selection of a hotel/motel or other locations. These results demonstrate the need for adequate planning and preparation for public shelters to shelter those with disabilities. The relationship is statistically significant with a chi square value of 17.01 with a 99% level of confidence ($p<.01$).

Table 7.8: Evacuation Location by Presence of Disability

Evacuation Location	Presence of a Disability	
	Disability Present	No Disability Present
Friend, Family Advice	46.3 (158)	59.5 (69)
Hotel or Motel	21.4 (73)	25.0 (29)
Public Shelter	25.8 (88)	7.8 (9)
Other	6.5 (22)	7.8 (9)
Total	100.0 (341)	100.0 (116)

Chi Square = 17.01 (3 d.f.), p < 0.001, Lambda .000
Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

Table 7.9 displays the relationship between evacuation location and limitation on ADLs. The data show that as impact to ADLs increases, respondents with disabilities are less likely to evacuate to homes of friends and family members and more likely to evacuate to public shelters. As impact to ADLs increase, respondents reporting evacuation to homes of friends and family members drops steadily from 59.5% (for households with no disability reported) to 41.7% (for households reporting significant impact on ADLs). Inversely, evacuation to public shelter increases as ADLs increase, from 7.8% (for households with no disability reported) to 29.9% (for households reporting significant impact on ADLs). The relationship is statistically significant with a chi square value of 21.62 with a 99% level of confidence (p<.01).

Table 7.9: Evacuation Location by ADL Assessment

Evacuation Location	Limitation on Activities per ADL			
	No Disability Reported	Minimal Impact on ADL	Moderate Impact on ADL	Significant Impact on ADL
Friend, Family Advice	59.5 (69)	52.2 (47)	47.9 (46)	41.7 (60)
Hotel or Motel	25.0 (29)	21.1 (19)	22.9 (22)	20.1 (29)
Public Shelter	7.8 (9)	21.1 (19)	24.0 (23)	29.9 (43)
Other	7.8 (9)	5.6 (5)	5.2 (5)	8.3 (12)
Total	100.0 (116)	100.0 (90)	100.0 (96)	100.0 (144)

Chi Square = 21.62 (9 d.f.), p < 0.010, Lambda .017
Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

Table 7.10 displays the relationship between evacuation location and number of disabilities per household. The data show that as the number of disabilities in a household increase, respondents are less likely to evacuate to homes of friends and family members and more likely to evacuate to public shelters. This finding is consistent with the relationship between evacuation location and ADLs in Table 7.9. As the number of disabilities per household increases, respondents reporting evacuation to homes of friends and family members drops steadily from 60.2% (for households with no disability reported) to 40.0% (for households reporting 3 or more disabilities). Inversely, evacuation to public shelter increases as number of disabilities per household increase, from 7.6% (for households with no disability reported) to 29.3% (for households reporting 3 or more disabilities). The data again confirms the necessity for public shelter preparedness for those with disabilities. The relationship is statistically significant with a chi square value of 26.59 with a 99% level of confidence (p<.01).

Table 7.10: Evacuation Location by Disabilities per Household

Evacuation Location	Number of Disabilities per Household			
	No Disabilities	1 Disability	2 Disabilities	3 or Greater Disabilities
Friend, Family Advice	60.2 (71)	49.1 (79)	45.1 (46)	40.0 (30)
Hotel or Motel	24.6 (29)	24.8 (40)	17.6 (18)	20.0 (15)
Public Shelter	7.6 (9)	21.1 (34)	31.4 (32)	29.3 (22)
Other	7.6 (9)	5.0 (8)	5.9 (6)	10.7 (8)
Total	100.0 (118)	100.0 (161)	100.0 (102)	100.0 (75)

Chi Square = 26.59 (9 d.f.), p < 0.002, Lambda .002
Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

Key Resources or Necessities on hand During Most Recent Evacuation

Respondents with disaster-evacuation experience were asked if when they evacuated if they had everything they needed in terms of key resources, such as access to medical care or safe shelter. Of those with direct, recent evacuation experience, an overwhelming majority (84.5%) said they did have key resources on hand. Whether respondents had necessities for evacuation is evaluated in this section by the limitation on ADLs; number of disabilities; evacuation capacity; and shelter-in-place capacity. All relationships were statistically significant.

Figure 7.5: All Respondents: When Evacuated, Had Key Resources/Necessities

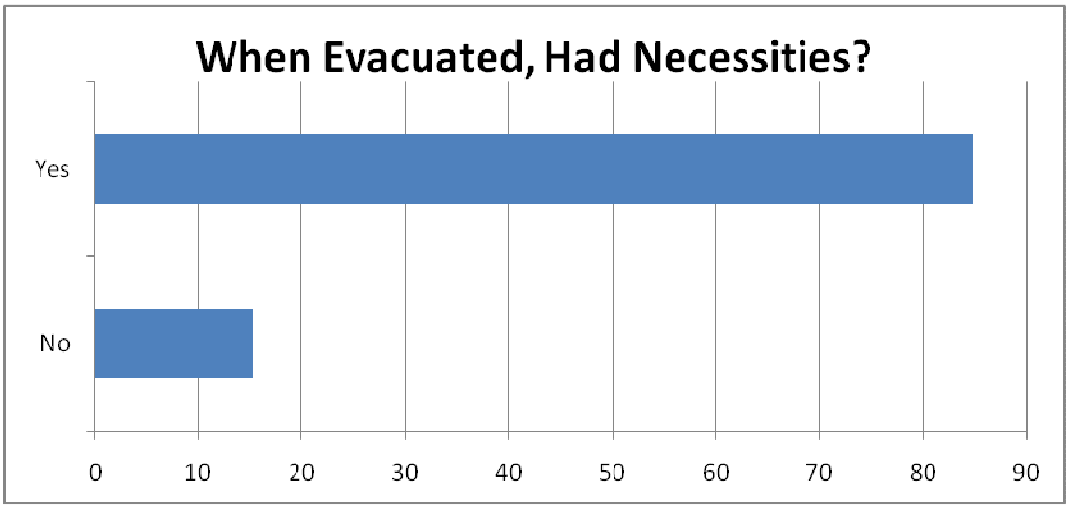


Table 7.11 shows the relationship between whether respondents had key resources or necessities for evacuation and the presence of disabilities in the household. The data show that those with disabilities are less likely to have necessities when they evacuate. Almost 20 percent (18.8%) of those with disabilities did not have the items they needed when they evacuated, compared to only 5.2% of those with no disabilities. This is a difference of 13.6 percent. The relationship is statistically significant with a chi square value of 12.15 with a 99% level of confidence ($p<.01$). Further, when considering the odds ratios, we can see that while a large percentage of respondents in the aggregate said they had sufficient key resources or necessities, households with no disability reported were actually 4.20 times more likely to answer yes to the question than households where disability is present. (The odds ratio calculation is 18.17:4.33.)

Table 7.11: When Evacuated, Had Key Resources/Necessities by Presence of Disability

Had Sufficient Key Resources/ Necessities?	Disability Present in Household	
	Disability Present	No Disability Present
Yes	81.2 (277)	94.8 (109)
No	18.8 (64)	5.2 (6)
Total	100.0 (341)	100.0 (115)

Chi Square = 12.15, (1 d.f.), p < 0.001, Lambda = .000
Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

Table 7.12 exhibits the relationship between whether respondents had key resources or necessities for evacuation and severity of limitations on ADLs. Respondents with minimal and moderate limitations were nearly identical, but those with no disabilities and those with significant impact on ADLs measured a substantial difference. More than 20 percent (21.7%) of those with significant limitations did not have key resources on hand when they evacuated compared to only 5.2% of persons with no disabilities. The average for those with ADL limitations who stated they did have key resources on hand were 78.3%, a full 16.5% difference below those with no disabilities (94.8%). The relationship is statistically significant with a chi square value of 13.95 with a 99% level of confidence (p<.01).

When reviewing the odds ratio and measuring those who had necessities and those who did not have necessities when they evacuated by the impact on the respondents activities of daily living, a respondent with no disabilities was 4.39 times more likely to have adequate necessities when he/she evacuated. (The odds ratio computation is 18.17:4.14 with minimal, moderate and significant impact on ADL being collapsed into one category).

Table 7.12: When Evacuated, Had Key Resources/Necessities by ADL Assessment

Had Sufficient Key Resources/ Necessities?	Limitation on Activities per ADL			
	No Disability Reported	Minimal Impact on ADL	Moderate Impact on ADL	Significant Impact on ADL
Yes	94.8 (109)	82.2 (74)	82.3 (79)	78.3 (112)
No	5.2 (6)	17.8 (16)	17.7 (17)	21.7 (31)
Total	100.00 (115)	100.0 (90)	100.0 (96)	100.0 (143)

Chi Square = 13.95, (3 d.f.), p < 0.003, Lambda = .000
Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

Table 7.13 demonstrates the relationship between whether respondents had key resources or necessities for evacuation and the number of disabilities present in the household. The data show that lack of necessities for evacuation increases steadily as the number of disabilities in a household increase. Only 5.1% of persons with no disabilities in the household report shortages of key resources during evacuation, which increases to 28.4% for persons with 3 or more disabilities reported by household. This demonstrates one of the largest differences, a total of 23.3% change from no disability reported to 3 or greater. The relationship is statistically significant with a chi square value of 19.26 with a 99% level of confidence (p<.01).

The odds ratio measures those who had key resources or necessities when they evacuated and those who did not by the number of disabilities per household. The odds ratio clearly indicates that those households with no disabilities were far more equipped with key resources for evacuation than those households with disabilities. Those respondents who reported no disabilities in their households were 4.32 times more likely to have adequate necessities as

opposed to those respondents who reported one or multiple disabilities in their household. (The odds ratio computation is 18.5:4.28 with households reporting at least one disability being collapsed into one category).

Table 7.13: When Evacuated, Had Key Resources/Necessities by Disabilities per Household

Had Sufficient Key Resources/ Necessities?	Number of Disabilities per Household			
	No Disabilities	1 Disability	2 Disabilities	3 or Greater Disabilities
Yes	94.9 (111)	84.0 (137)	83.2 (84)	71.6 (53)
No	5.1 (6)	16.0 (26)	16.8 (17)	28.4 (21)
Total	100.0 (117)	100.0 (163)	100.0 (101)	100.0 (74)

Chi Square = 19.26, (3 d.f.), p < 0.001, Lambda = .000
Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

Table 7.14 shows the relationship between whether respondents had key resources or necessities for evacuation and their capacity to evacuate. There is a direct relationship between necessities and evacuation capacity. The better prepared hypothetically a household was for evacuation, the more likely that in their actual evacuation they had the key resources they needed. The cross tab shows a steady increase for having key resources during their actual evacuation from 64.6% for those who thought they were not at all prepared to 93.9% for those who indicated they were well prepared for an evacuation. The relationship is statistically significant with a chi square value of 42.06 with a 99% level of confidence (p<.01).

Table 7.14: When Evacuated, Had Key Resources/Necessities by Evacuation Capacity

Had Sufficient Key Resources/ Necessities?	Evacuation Capacity Assessment			
	Not Prepared At All	Not Very Well Prepared	Somewhat Prepared	Well Prepared
Yes	64.6 (31)	66.7 (32)	81.9 (104)	93.9 (214)
No	35.4 (17)	33.3 (16)	18.1 (23)	6.1 (14)
Total	100.0 (48)	100.0 (48)	100.0 (127)	100.0 (228)

Chi Square = 42.06, (3 d.f.), p < 0.001, Lambda = .031

Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

Table 7.15 displays the relationship between whether respondents had access to key resources or necessities during their actual evacuation and their anticipated capacity to shelter-in-place. These results are similar to evacuation capacity. The better prepared hypothetically a household was to shelter-in-place, the more likely that in their actual evacuation they had the key resources they needed. The cross tab shows a steady increase for having key resources during their actual evacuation from 71.4% for those who thought they were not at all prepared to 95.0% for those who indicated they were well prepared to shelter-in-place. The relationship is statistically significant with a chi square value of 35.52 with a 99 percent level of confidence ($p<.01$).

Table 7.15: When Evacuated, Had Key Resources/Necessities by Shelter-in-Place Capacity

Had Sufficient Key Resources/ Necessities?	Shelter-in-Place Capacity Assessment			
	Not Prepared At All	Not Very Well Prepared	Somewhat Prepared	Well Prepared
Yes	71.4 (45)	68.3 (28)	80.1 (117)	95.0 (191)
No	28.6 (18)	31.7 (13)	19.9 (29)	5.0 (10)
Total	100.0 (63)	100.0 (41)	100.0 (146)	100.0 (201)

Chi Square = 35.52, (3 d.f.), p < 0.001, Lambda = .059
Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

Quality of Most Recent Evacuation Experience

Respondents were asked to describe how well their most recent disaster and evacuation experience went. Respondents could select from the following answers: it went very smoothly, no problems; it went okay, I had most of the things that were needed; it didn't go very well; and I had major problems with lack of items and services. Most respondents with evacuation experience stated it either "went smoothly" (39.5%) or "went okay" (43.5%). A total of 17% (5.6% and 11.43%, respectively) stated it "didn't go well" or that there were "major problems" with the evacuation. See Figure 7.6. Most recent evacuation experience is evaluated in this section by the limitation on ADLs; number of disabilities; and hazard type. The relationship between most recent evacuation location and hazard type was the only one that was not statistically significant.

Figure 7.6: All Respondents: Describe Most Recent Evacuation Experience

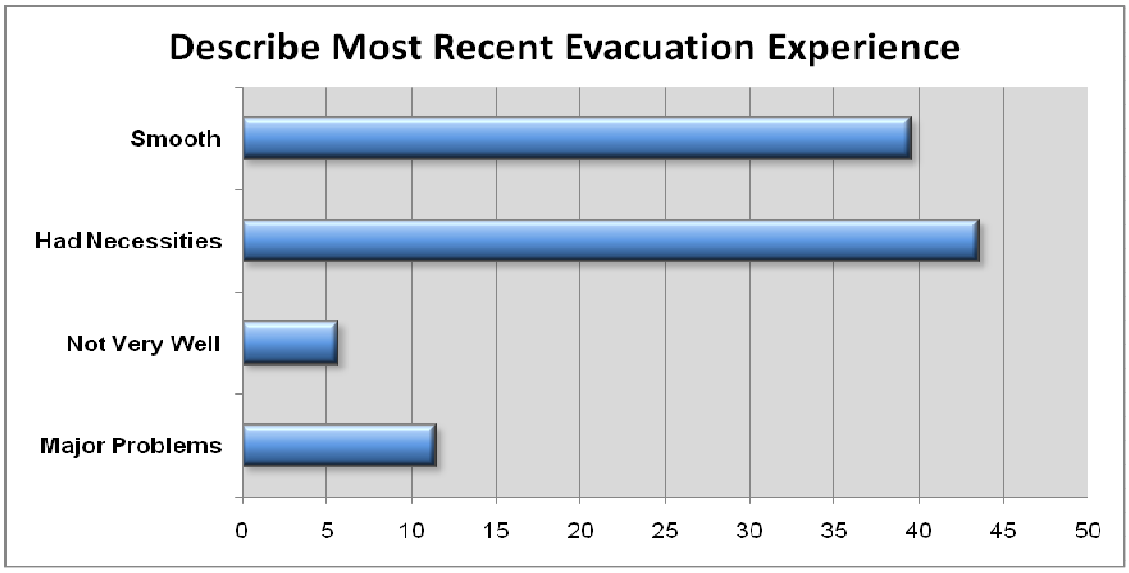


Table 7.16 demonstrates the relationship between respondents' most recent evacuation experience and the presence of disabilities in the household. The data show a large difference between those with disability and their most recent evacuation. Approximately, 59.5% of those with no disabilities present in the household stated their most recent evacuation experience went smoothly, compared to only 32.6 percent of respondents with disabilities in the household. Fourteen percent of those with disabilities reported major problems, compared to only 3.4% of respondents with no disability present in the household. The relationship is statistically significant with a chi square value of 29.16 with a 99 percent level of confidence ($p<.01$).

Table 7.16: Most Recent Evacuation Experience by Presence of Disability

Most Recent Evacuation Experience	Presence of Disability	
	Disability Present	No Disability Present
Smooth	32.6 (107)	59.5 (69)
Okay, Had Necessities	47.3 (155)	31.9 (37)
Not Very Well	5.8 (19)	5.2 (6)
Major Problems	14.3 (47)	3.4 (4)
Total	100.0 (328)	100.0 (116)

Chi Square = 29.16, (3 d.f.), $p < 0.001$, Lambda = .087
Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

Table 7.17 documents the relationship between respondents' most recent evacuation experience and limitations in ADLs. The data show that respondents were more likely to have a smooth evacuation the fewer the limitations on ADLs. Respondents who reported major problems during their most recent evacuation were more likely to have more significant limitations. For those who experienced major problems there was a difference of 15.6% between respondents with no disabilities (3.4%) and those with significant impact of limitations (19.0%). The relationship is statistically significant with a chi square value of 42.26 with a 99 percent level of confidence ($p<.01$).

An odds ratio comparison of respondents' most recent evacuation experience and the impact on their activities of daily living reveals that respondents reporting no disabilities were 2.80 times more likely to report a positive evacuation experience. (The odds ratio computation is 10.6:3.79 with minimal, moderate and significant impact on ADL collapsed into one column and smooth and had necessities being collapsed into one row). Accordingly, it is can be inferred that those reporting an impact on their activities of daily living have a greater difficulty in responding to an evacuation.

Table 7.17: Most Recent Evacuation Experience by ADL Assessment

Most Recent Evacuation Experience	Impact on Activities per ADL			
	No Disability Reported	Minimal Impact on ADL	Moderate Impact on ADL	Significant Impact on ADL
Smooth	59.5 (69)	46.0 (40)	32.6 (30)	24.8 (34)
Okay, Had Necessities	31.9 (37)	41.4 (36)	47.8 (44)	48.2 (66)
Not Very Well	5.2 (6)	4.6 (4)	4.3 (4)	8.0 (11)
Major Problems	3.4 (4)	8.0 (7)	15.2 (14)	19.0 (26)
Total	100.0 (116)	100.0 (87)	100.0 (92)	100.0 (137)

Chi Square = 42.26, (9 d.f.), p < 0.001, Lambda = .131
Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

Table 7.18 displays the relationship between respondents' most recent evacuation experience and number of disabilities in the household. This table supports the data shown in the previous table. Respondents with fewer disabilities are more likely to experience a smooth evacuation. There was a difference of more than 37.4% between the reported experiences (evacuation went

smoothly) of those with 3 or more disabilities (21.1%) and those without (58.5%). For those who experienced major problems, there was a difference of more than 20 percent between respondents with no disabilities reporting major problems with the evacuation (3.4%) and those with three or more disabilities reporting major problems (23.9%). The relationship is statistically significant with a chi square value of 41.98 with a 99 percent level of confidence ($p<.01$).

In reviewing the odds ratio of respondents' most recent evacuation experience and the number of disabilities per household, a respondent reporting no disabilities in his/her household was 2.74 times more likely to report that his/her evacuation experience was positive. (The odds ratio computation is 10.8:3.94 with smooth and it went okay being collapsed into one row). Therefore, it is reasonable to infer that those who have a person with a disability in their household has a significantly negative effect on a respondent's evacuation experience.

Table 7.18: Most Recent Evacuation Experience by Disability per Household

Most Recent Evacuation Experience	Disabilities per Household			
	No Disabilities	1 Disability	2 Disabilities	3 or Greater Disabilities
Smooth	58.5 (69)	38.5 (60)	30.3 (30)	21.1 (15)
Okay, Had Necessities	33.1 (39)	46.8 (73)	47.5 (47)	49.3 (35)
Not Very Well	5.1 (6)	4.5 (7)	8.1 (8)	5.6 (4)
Major Problems	3.4 (4)	10.3 (16)	14.1 (14)	23.9 (17)
Total	100.0 (118)	100.0 (156)	100.0 (99)	100.0 (71)

Chi Square = 41.98, (9 d.f.), $p < 0.001$, Lambda = .076
Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

After the Evacuation

Respondents were asked how their health and physical well-being were following their return home and the large majority (69.1%) said they were "about the same." As many as 23.6% said they were worse off and 6.6% said they were better off following the disaster and resulting evacuation. See Figure 7.7. Experiences after the evacuation are evaluated in this section by the limitation on ADLs; membership in volunteer organizations; evacuation capacity; and shelter-in-place capacity. The relationship between health and wellbeing upon return from evacuation and membership in volunteer organizations and the presence of disability were not statistically significant.

Figure 7.7: All Respondents: Health and Wellbeing Upon Returning Home

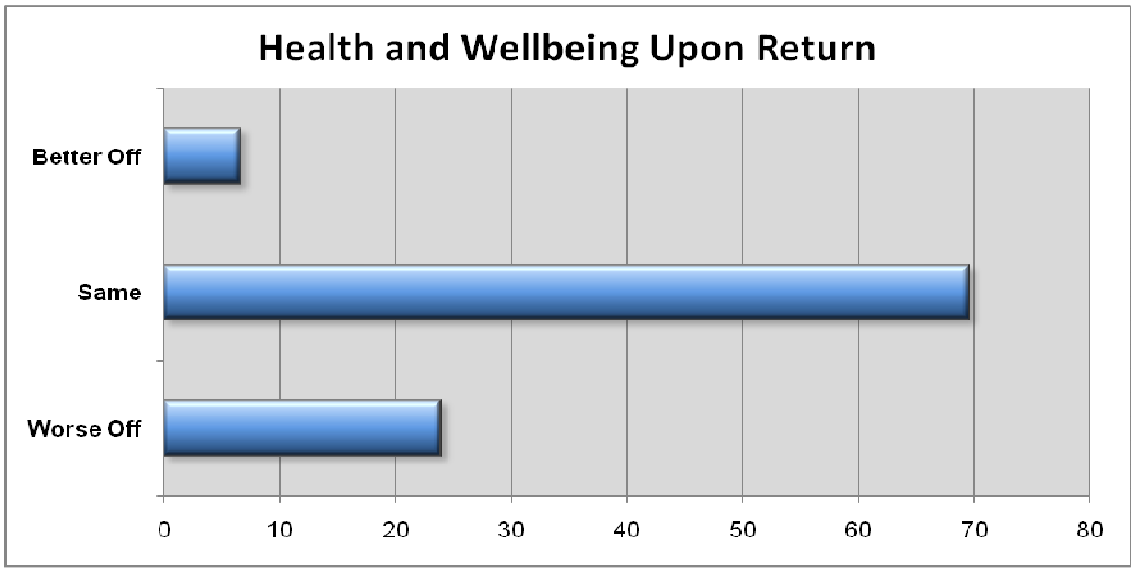


Table 7.19 shows the relationship between health and wellbeing after the evacuation and limitation on ADLs. Responses varied for most cross tabs, with the largest differences revealed by those who reported the most significant ADLs. This group reported 18-20 percent fewer respondents who stated they were "about the same" in the aftermath of their recent evacuation. This is the same group who also reported 20-13 percent more respondents who reported their disaster evacuation experience left them worse off. The relationship is statistically significant with a chi square value of 15.21 with a 95 percent level of confidence ($p<.05$).

The odds ratio relating a respondent's health and wellbeing following an evacuation with the impact on activities of daily living indicates that those with no disability are 1.31 times more likely to report being better off or about the same than those reporting some impact on their activities of daily living. (The odds ratio computation is 3.75:2.86 with better off and about the same being collapsed into one row).

Table 7.19: Health and Wellbeing upon Return by ADL Assessment

Health and Wellbeing upon Return	Limitations on Activities per ADL			
	No Disability Reported	Minimal Impact on ADL	Moderate Impact on ADL	Significant Impact on ADL
Better Off	4.4 (5)	8.2 (6)	3.0 (2)	8.1 (9)
About the Same	74.6 (85)	76.7 (56)	74.6 (50)	56.8 (63)
Worse Off	21.1 (24)	15.1 (11)	22.4 (15)	35.1 (39)
Total	100.0 (114)	100.0 (73)	100.0 (67)	100.0 (111)

Chi Square = 15.21, (6 d.f.), p < 0.019, Lambda .052
Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

Table 7.20 shows the relationship between health and wellbeing after the evacuation and number of disabilities reported for each household. Responses for this crosstab showed no clear pattern. Unlike the previous table that does show one pattern for persons reporting significant ADLs, this cross tab show no discernible pattern. When the odds ratio is computed, there was an indication that those with no disabilities reported being better off or about the same prior to the disaster evacuation. Those with no disabilities reported were 1.19 more likely to report that they were not negatively affected by the evacuation and did not suffer dire consequences as a result of the same. (The odds ratio computation is 3.6:3.02 with better off and about the same being collapsed into one row). Therefore, it is important to note that evacuation does have negative consequences for those reporting a disability in their household.

Table 7.20: Health and Wellbeing upon Return by Disabilities per Household

Outcome after Evacuation Return	Number of Disabilities Reported in Household			
	No Disability Reported	1 Disability	2 Disabilities	3 or Greater Disabilities
Better Off	4.3 (5)	8.3 (11)	9.7 (7)	3.5 (2)
About the Same	73.9 (85)	75.8 (100)	52.8 (38)	66.7 (38)
Worse Off	21.7 (25)	15.9 (21)	37.5 (27)	29.8 (17)
Total	100.0 (115)	100.0 (132)	100.0 (72)	100.0 (57)

Chi Square = 17.53, (6 d.f.), p < 0.008, Lambda .017
Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

Table 7.21 demonstrates the relationship between health and wellbeing and evacuation capacity. The majority of respondents in each preparation category judged themselves to be about the same as before evacuation regarding their health and wellness. The exception was those who anticipated for a hypothetical evacuation that they would not be at all prepared. The majority (54.8%) of these respondents reported being worse off. Data trends show that those who reported the least of amount of preparation were also worse off post-evacuation. The relationship is statistically significant with a chi square value of 15.21 with a 95 percent level of confidence (p<.05).

Table 7.21: Health and Wellbeing upon Return by Evacuation Capacity

Outcome after Evacuation Return	Level of Household Evacuation Capacity			
	Not Prepared At All	Not Very Well Prepared	Somewhat Prepared	Well Prepared
Better Off	9.7 (3)	8.6 (3)	6.3 (6)	6.3 (13)
About the Same	35.5 (11)	57.1 (20)	71.9 (69)	75.5 (157)
Worse Off	54.8 (17)	34.3 (12)	21.9 (21)	18.3 (38)
Total	100.0 (31)	100.0 (35)	100.0 (96)	100.0 (208)

Chi Square = 24.76, (6 d.f.), p < 0.001, Lambda .022.
Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

Table 7.22 demonstrates the relationship between health and wellbeing following an evacuation and respondents reported capacity to shelter-in-place. The majority of respondents in each preparation category judged themselves to be about the same as before evacuation regarding their health and wellness. The largest difference was in those who reported they were worse off. As many as 40.6% said they were not very well prepared to shelter-in-place and were worse off following the actual evacuation, compared to only 16.9 percent of those who said they were well prepared to shelter. This is a nearly 24 percent difference between these two categories, those who said they were both well prepared for sheltering independently and were worse off. The relationship is statistically significant with a chi square value of 17.1 with a 99 percent level of confidence (p<.01).

Table 7.22: Health and Wellbeing upon Return by Shelter-in-Place Capacity

Outcome after Evacuation Return	Shelter-in-Place Capacity Assessment			
	Not Prepared At All	Not Very Well Prepared	Somewhat Prepared	Well Prepared
Better Off	6.4 (3)	12.5 (4)	5.2 (6)	6.7 (12)
About the Same	57.4 (27)	46.9 (15)	68.7 (79)	76.4 (136)
Worse Off	36.2 (17)	40.6 (13)	26.1 (30)	16.9 (30)
Total	100.0 (47)	100.0 (32)	100.0 (115)	100.0 (178)

Chi Square = 17.066, (6 d.f.), p < 0.009, Lambda .000
Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

VIII. FINDINGS: SOURCES FOR DISASTER INFORMATION

This section focuses on sources of information for impending evacuations and disasters and includes two variables: (1) the source respondents used to learn about a recent disaster and evacuation and (2) the most important information source that respondents with and without disaster experience typically use. The first question asked: "How did you learn that an evacuation was taking place?" Respondents could choose one of the following alternatives: TV, radio, family/friends/neighbor, fire or police came to the door, automated phone call, NOAA weather band radio, or other. The second question asked: "If something like a flood or hurricane was about to occur, which of the following is the MOST IMPORTANT source of information you would use to find out what was going to happen?" Respondents could choose from among the following alternatives: government announcement or warning; family/friends/neighbors; new organization, some other organizations like the Red Cross, or other.

Table 8.1: Recent Evacuation Information Source Used by Number of Disabilities

Source of Evacuation Information	Number of Disabilities per Household						
	0	1	2	3	4	5	**Total**
TV	62.8 (98)	64.8 (140)	66.7 (92)	62.7 (37)	52.0 (13)	40.0 (40)	63.6 (384)
Radio	12.8 (20)	5.1 (11)	3.6 (5)	6.8 (4)	.0 (0)	.0 (0)	6.6 (40)
Family, friend, neighbor	7.1 (11)	14.8 (32)	15.9 (22)	6.8 (4)	16.0 (4)	30.0 (3)	12.6 (76)
Fire or police came to my door	6.4 (10)	.5 (1)	2.9 (4)	3.4 (2)	4.0 (1)	10.0 (1)	3.1 (190
Automated phone call	2.6 (4)	.9 (2)	.0 (0)	.0 (0)	.0 (0)	.0 (0)	1.0 (6)
NOAA weather band radio	1.9 (3)	.9 (2)	.7 (1)	3.4 (2)	8.0 (2)	.0 (0)	1.7 (10)
Other	6.4 (10)	13.0 (28)	10.1 (14)	16.9 (10)	20.0 (5)	20.0 (2)	11.4 (69)
Total	100.0 (156)	100.0 (216)	100.0 (138)	100.0 (590	100.0 (25)	100.0 (10)	100.0 (604)

Both of these information source items are examined for a number of subgroups in the study, including characteristics of their disabilities, state of residence, hazard type, personal and organizational support, and assistance that the respondents and their households may receive. Social support and assistance is examined both in non-disaster and disaster settings. As in the section on household preparedness, understanding some factors which may help distinguish groups who communicate using different sources of information adds to our knowledge of sources for information and communication in evacuations.

In Table 8.1, the influence of total number of different types of disabilities for an individual respondent on the most recent source of evacuation information is examined. Because of the number of cells (35) in this cross tab table, many of the possible combinations of number of disabilities and source of information about an evacuation have 5 or fewer cases. However, there is a positive relationship between number of disabilities and reliance on family, friends, and neighbors for information.

The largest majority of respondents (63.6%) rely on television for their primary source of disaster information. For respondents with 3 or more disabilities, 57.4% of respondents rely on television as their primary source of information, while the percentage relying on television for persons with 0, 1, or 2 disabilities is higher at 62.8%, 64.9%, and 66.7% respectively.

Cross tab results also show that for those with no disability, only 7.1% of respondents rely on family, friends, and neighbors for information on evacuation. However, for those with 1 or 2 disabilities that percentage more than doubles to 14.8% and 15.9%, respectively. For respondents with 3 or more disabilities, 11.7% rely on family, friends, and/or neighbors as their most important source of information about the evacuation. The opposite is true for radio use, though again the numbers in each cell are not large. For those with no disability, 12.8% rely on radio as their most important source of information in an evacuation. For persons with 1 disability, only 5.1% rely on radio. For persons with 2 or more disabilities, only 4.6% of these respondents rely on the radio as their most important source of evacuation information.

Another potentially useful observation from this table is that respondents are more likely to rely on the non-specific “other” category as the number of different types of disabilities that they have increase. A number of these “other” responses mention personal or organizational contacts, which is consistent with the higher rate of use of family, friends, and/neighbors as well as other organizations to provide information for those with 1 or more disability types. These results, taken as a whole, suggest that individuals with 1 or several types of disabilities are less likely to rely on TV or radio media. These individuals rely much more on face-to-face communication with family, friends, neighbors, or disability service organizations for information on evacuations. The cross tab for this table is statistically highly significant at better than the 99.9% level of confidence and has a Pearson $\chi 2$ value = 60.51 (df = 30, n = 604), with an effect size (eta) η = .12.

Table 8.2: Recent Evacuation Information Source Used by Level of Limitation on ADL

Evacuation Information Source by Level of Limitation on ADL	Limitations on Activities per ADL Assessment				
	No Disability Reported	Minimal Impact on ADL	Moderate Impact on ADL	Significant Impact on ADL	**Total**
TV	63.0 (97)	65.3 (81)	72.1 (93)	58.8 (110)	64.1 (381)
Radio	13.0 (20)	5.6 (7)	4.7 (6)	3.2 (6)	6.6 (39)
Family, friend, neighbor	7.1 (11)	18.5 (23)	10.1 (13)	15.0 (28)	12.6 (75)
Fire or police came to my door	7.1 (11)	18.5 (230	10.1 (13)	15.0 (28)	12.6 (750)
Automated phone call	2.6 (4)	1.6 (2)	.0 (0)	.0 (0)	1.0 (6)
NOAA weather band radio	1.3 (2)	.8 (1)	.0 (0)	3.2 (6)	1.5 (9)
Other	6.5 (10)	8.1 (10)	10.1 (13)	17.1 (32)	10.9 (650)
Total	100.0 (154)	100.0 (124)	100.0 (129)	100.0 (187)	100.0 (594)

Table 8.2 compares rates of using a particular single source as the most recent source of information in an actual evacuation, and compares these rates by level of limitation on activities of daily living. The results in this table show that persons with a disability that is accompanied by significant limitations of activities of daily living are less likely (58.8%) to use the television as their most important source of information in an evacuation, compared to those with no limitations (63.0%), persons with minimal levels of limitations (65.3%), and especially those with a moderate level of limitation (72.1%). The same pattern is apparent with radio use, with only 3.2% of persons with significant limitations resulting from their disability using the radio as their main source of information during an evacuation.

For reliance on family, friends, or neighbors, we see a pattern of responses similar to Table 8.1, above. While only 7.1% of persons reporting no disability or resulting impact to ADLs report that they use this source as their most important source of information, from 10 to 19 percent of persons with limitations use family, friends, and/or neighbors. Again, rates of use of the “other” category increases as the level of functional limitation increases. While only 6.5% of those

reporting no limitations use the "other" category, 17.1%, of persons with significant limitations reports use of the "other" category. The "other" category includes a number of responses which involve communication with other people, groups, or organizations, as well as electronic devices and media more accessible to persons with disabilities. Overall, those with more significant functional limitations are less likely to use media such as television and radio, and are more likely to obtain information from personalized sources such as friends, family, neighbors, and service provider organizations. The cross tab for this table is statistically highly significant and has a Pearson $\chi 2$ value = 57.62 (df = 18, n = 594), with an effect size (eta) η = .14.

Table 8.3: Most Important Information Source in Disaster by Disability Type

Source of Evacuation Information	Type of Disability						
	Cognitive	Medical	Mental Health	Mobility	Vision	Hearing	**Total**
Government Announcement/ Warning	23.6 (37)	24.2 (104)	25.5 (35)	26.2 (90)	27.8 (35)	21.3 (35)	24.8 (336)
Family, Friends or Neighbors	16.6 (26)	12.6 (54)	21.9 (30)	13.1 (45)	12.7 (16)	31.1 (51)	16.4 (222)
News Organization	47.1 (74)	49.0 (210)	38.0 (52)	49.4 (170)	44.4 (56)	33.5 (55)	45.5 (617)
Some Other Organization, like the Red Cross	3.8 (6)	5.6 (24)	3.6 (5)	3.8 (13)	2.4 (3)	6.7 (11)	4.6 (62)
Other	8.9 (14)	8.6 (37)	10.9 (15)	7.6 (26)	12.7 (16)	7.3 (12)	8.8 (120)
Total	100.0 (157)	100.0 (429)	100.0 (137)	100.0 (344)	100.0 (126)	100.0 (164)	100.0 (1357)

Table 8.3 examines the relationship between disability type on the most important source of evacuation information people might use in a disaster. In this table, most persons with disabilities rely heavily on news organizations (63.6%), a smaller percentage of respondents rely on a government announcements or warnings (24.8%), and the third-ranking source is family, friends, and/or neighbors (16.4%). The least commonly used source is another organization such as the American Red Cross (4.6%). For each of the disability types, from over one-third to nearly one-half of respondents report using a news organization as their primary source of information in an evacuation. Persons with hearing and mental health disabilities use family, friends, and/or neighbors at a rate higher than any of the other disability groups (31.1% and 21.9% versus 13 to 17%). For those who are deaf or hard of hearing, their second most frequent source of information is family, friends, or neighbors (31.1%), rather than a government announcement or warning (21.3%). There is almost equal reliance on news organizations and personal sources including family, friends, and/or neighbors. Persons who are deaf and hard of

hearing and persons with mental health disabilities use news organizations at a lower rate (33.5% and 38.0%, respectively) than do all other persons with a disability. The cross tab for those with a medical disability is statistically significant at better than the 99% confidence level, and has a Pearson $\chi 2$ value = 13.91 (*df* = 4, *n* = 799), with an effect size (eta) η = .13. The cross tab for those with hearing limitations is statistically significant at better than the 99.9% confidence level, and has a Pearson $\chi 2$ value = 32.46 (*df* = 4, *n* = 799), with an effect size (eta) η = .20 and (phi) Φ = .20.

Table 8.4: Most Important Information Source in Disaster by Number of Disabilities

Source of Evacuation Information	Number of Disabilities per Household						
	0	1	2	3	4	5	**Total**
Government Announcement/ Warning	17.1 (60)	24.1 (95)	23.0 (53)	29.1 (32)	27.5 (11)	9.1 (1)	22.2 (252)
Family, Friends or Neighbors	7.1 (25)	17.7 (70)	15.7 (36)	15.5 (17)	15.0 (6)	18.2 (2)	13.7 (156)
News Organization	58.4 (205)	44.8 (177)	50.9 (117)	40.0 (44)	42.5 (17)	45.5 (5)	49.7 (565)
Some Other Organization, like the Red Cross	5.1 (18)	6.6 (26)	4.8 (11)	2.7 (3)	2.5 (1)	9.1 (1)	5.3 (60)
Other	12.3 (43)	6.8 (27)	5.7 (13)	12.7 (14)	12.5 (5)	18.2 (2)	9.1 (104)
Total	100.0 (351)	100.0 (395)	100.0 (230)	100.0 (110)	100.0 (40)	100.0 (11)	100.0 (1137)

Table 8.4 examines the possible influences of total number of disabilities reported in a household on the respondent's most important information source that they might access in a disaster. This table shows that as the number of disabilities in a household increase there is a greater likelihood of reliance on government announcements or warnings and on family friends, and neighbors and a lesser likelihood of reliance on news organizations. While only 17.1% of those reporting no disability rely on this source, for those with 3 or more disability types 65.7% rely on government announcements or warnings as their most important source of information to find out about what was going to happen in an impending disaster. Also, only 7.1% of respondents reporting no disability predict that they would rely on family, friends, or neighbors, while at least 48.7% of those with 3 or more disabilities would rely on this source. Finally, persons with no disabilities reported are more likely to use a news organization for their disaster information (58.4%) compared to those with disabilities. For those with 3 or more disabilities, only 39.1% of respondents rely on a news organization as their most important source of

information to find out what is going to happen in a disaster. This difference between those with no disability and those with three or more is nearly a twenty percent difference in rates of reliance on news organizations.

The overall pattern shown in this table is one of greater reliance on personal (family, friends, and neighbors) and governmental contacts and warnings, and less reliance on the news and electronic media. This pattern is consistent with the patterns of information use in Tables 8.1, 8.2, and 8.3. The cross tab for number of disabilities and most important source of information is highly statistically significant, and has a Pearson $\chi 2$ value = 50.93 (df = 20, n = 1137), with an effect size (eta) η = .14.

Table 8.5: Most Important Information Source in Disaster by Limitations in ADL

Source of Evacuation Information	Limitation on Activities by ADL Assessment				
	No Disability Reported	Minimal Impact on ADL	Moderate Impact on ADL	Significant Impact on ADL	**Total**
Government Announcement/ Warning	17.3 (60)	21.2 (49)	27.5 (63)	24.4 (71)	22.1 (243)
Family, Friends or Neighbors	6.9 (24)	22.1 (51)	13.5 (31)	15.1 (44)	13.7 (150)
News Organization	58.2 (202)	47.2 (109)	46.3 (106)	45.4 (132)	50.0 (549)
Some Other Organization, like the Red Cross	5.2 (18)	3.5 (8)	6.1 (14)	5.5 (16)	5.1 (56)
Other	12.4 (43)	6.1 (14)	6.6 (15)	9.6 (28)	9.1 (100)
Total	100.0 (347)	100.0 (231)	100.0 (229)	100.0 (291)	100.0 (1098)

Table 8.5 presents results of a cross tab of level of limitations in activities of daily living (ADL) and the most important source of information a respondent would use to find out what is going to happen during a disaster. Most interesting for this table is that the patterns of information source use are very close to the patterns in the previous table (Table 8.4) which examines number of different types of disabilities rather than limitations in ADL. Just as in Table 8.4, as the level of limitations in ADL increases, the rates of use of government announcements or warnings and use of family, friends, and neighbors increase. The rates of use of news organizations decline as the level of limitations on ADL increases. Rates of news organization use and level of limitations in ADL are directly and inversely related to each other. Along with Tables 8.2-8.4, this table shows that persons with greater limitations on their activities of daily living are more likely to rely on personal sources of information and information from trusted organizations, especially government. Persons with more significant functional limitations rely less on news organizations than do persons with no or minimal limitations on ADLs. The cross

tab for impact on ADL and most important source of information in a disaster is highly statistically significant, and has a Pearson $\chi 2$ value = 48.32 (*df* = 12, *n* = 1098), with an effect size (eta) η = .14.

Table 8.6: Recent Source of Evacuation Information Used by State of Residence

Source of Evacuation Information	State of Residence							
	CA	FL	LA	NC	MO	TX	WV	**Total**
TV	48.0 (24)	71.0 (710)	63.6 (112)	56.4 (22)	59.6 (28)	70.9 (127)	13.3 (2)	63.7 (386)
Radio	8.0 (4)	7.0 (7)	6.8 (12)	17.9 (7)	4.3 (2)	3.9 (7)	6.7 (1)	6.6 (40)
Family, friend, neighbor	8.0 (4)	8.0 (8)	15.9 (28)	10.3 (4)	17.0 (8)	7.8 (14)	66.7 (10)	12.5 (76)
Fire or police came to my door	14.0 (7)	2.0 (2)	.6 (1)	5.1 (2)	6.4 (3)	2.2 (4)	.0 (0)	3.1 (19)
Automated phone call	12.0 (6)	.0 (0)	.0 (0)	.0 (0)	.0 (0)	.0 (0)	.0 (0)	1.0 (6)
NOAA weather band radio	.0 (0)	2.0 (2)	1.1 (2)	2.6 (1)	2.1 (1)	1.1 (2)	13.3 (2)	1.7 (10)
Other	10.0 (5)	10.0 (10)	11.9 (21)	7.7 (3)	10.6 (5)	14.0 (25)	.0 (0)	11.4 (69)
Total	100.0 (50)	100.0 (100)	100.0 (176)	100.0 (39)	100.0 (47)	100.0 (179)	100.0 (15)	100.0 (606)

Table 8.6 presents results from the crosstab of source of evacuation information used in a recent disaster by state of residence. What is most interesting about this table is that each state has a somewhat unique pattern of use of information sources. Residents of California rely predominately on television (48%), but secondarily on fire or police personnel coming to homes (14.0%), and automatic phone calls (12.0%). The State of California is likely to have engaged in more planning for its residents with disabilities, and more methods for evacuation warning are used. Residents of Florida rely overwhelmingly on television (71.0%). In Louisiana, residents rely primarily on television (63.6%) and secondarily on family, friends, and/or neighbors. Just as with the states discussed in for Table 8.6, North Carolina residents rely mostly on television (56.4%), but also on radio (17.9%) and family, friends, and/or neighbors (10.3%). Residents of North Carolina are heavy users of the electronic media, and 74.3% of the residents of this state rely on either television or radio. Missouri residents have the same pattern as residents of

Louisiana, relying heavily on television (59.6%) and also family, friends, and/or neighbors. Residents of Texas rely heavily on television, similar to the pattern of information use in Florida. West Virginia has too few cases in each cell to determine the pattern of information use to find out about evacuation. However, it is very interesting that only residents in West Virginia rely heavily on family, friends, and / neighbors (66.7%) to find out about an evacuation. West Virginia residents rely much more than other states on their personal social networks of family, friends, and neighbors for information about evacuation. The cross tab for state of residence and information source used to find out about evacuations has a Pearson $\chi 2$ value = 174.38 (*df* = 36, *n* = 606), with an effect size (phi) Φ = .54.

Table 8.7: Recent Source of Evacuation Information Used by Hazard Type

Source of Evacuation Information	**Type of Hazard**				
	Hurricane	Wildfire	Flooding	Chemical Industrial	**Total**
TV	68.1 (310)	48.0 (24)	48.4 (30)	56.4 (22)	63.7 (386)
Radio	5.7 (26)	8.0 (4)	4.8 (3)	17.9 (7)	6.6 (40)
Family, friend, neighbor	11.0 (50)	8.0 (4)	29.0 (18)	10.3 (4)	12.5 (76)
Fire or police came to my door	1.5 (7)	14.0 (7)	4.8 (3)	5.1 (2)	3.1 (19)
Automated phone call	.0 (0)	12.0 (6)	.0 (0)	.0 (0)	1.0 (6)
NOAA weather band radio	1.3 (6)	.0 (0)	4.8 (3)	2.6 (1)	1.7 (10)
Other	12.3 (56)	10.0 (5)	8.1 (5)	7.7 (3)	11.4 (69)
Total	100.0 (455)	100.0 (50)	100.0 (62)	100.0 (39)	100.0 (606)

The results displayed in Table 8.7 mirror those in the previous table, given that the different hazard types are closely associated with particular states. Hurricanes are most prevalent in Texas, Louisiana, and Florida, and similar to the pattern in these states, the large majority

(68.1%) of respondents in areas vulnerable to hurricanes relies on television as the primary source of information for finding out about an evacuation. Also, 11.0% of respondents in this hazard area rely on family, friends, and neighbors for information in an evacuation. Since wildfires occur mostly in California, which is very vulnerable to this type of hazard threat, we see a similar pattern for respondents in wildfire-prone areas. The majority of respondents in areas vulnerable to wildfires rely on television, while gaining information from fire or police personnel coming to their home was the second most used source (14.0%) and the third is automated telephone calls (12.0%). Flooding is most prevalent in West Virginia and Missouri, and we again see that, while television is still the most important source for information (48.4%), 29.0% of respondents report relying on family, friends, and neighbors as their primary source of information. Finally, in our sample only North Carolina residents were impacted by a recent chemical / industrial disaster, and the pattern shown in Table 8.7 is very similar to that in Table 8.6 for North Carolina residents. This cross tab for primary hazard and information source used to find out about evacuations has a Pearson $\chi 2$ value = 126.79 (df = 18, n = 606), with an effect size (phi) Φ = .46.

Table 8.8: Most Important Information Source in Disaster by Social Support in Disaster

Source of Evacuation Information	**Willingness to Receive Social Support in Disaster**				
	Strongly Agree	Agree	Disagree	Strongly Disagree	**Total**
Government announcement or warning	19.9 (54)	26.7 (47)	25.5 (13)	31.6 (12)	23.5 (126)
Family, friends or Neighbors	15.9 (43)	10.8 (19)	3.9 (2)	7.9 (3)	12.5 (67)
News organization	54.2 (147)	49.4 (87)	45.1 (23)	42.1 (16)	50.9 (273)
Some other organization, like the Red Cross	1.5 (4)	9.7 (6)	13.7 (6)	13.2 (2)	9.7 (18)
Other	8.5 (23)	9.7 (17)	13.7 (7)	13.2 (5)	9.7 (52)
Total	100.0 (271)	100.0 (176)	100.0 (51)	100.0 (38)	100.0 (536)

In Table 8.8, the influence of social support from family, friends, and neighbors on the most important source of information a respondent uses if a disaster is about to occur. Those respondents who strongly agree that they receive social support in a disaster are less likely than

those who strongly disagree that they receive social report to rely on government warnings as their primary source of information in a disaster. While only 19.9% of those who strongly agree rely on government warnings, 31.6% of respondents who strongly disagree rely on government warnings. This pattern is reversed for reliance on family, friends, and neighbors; and for reliance on news organizations. While 15.9% of those who strongly agree with the social support statement rely on family, friends, and/or neighbors, only 7.9% of those who strongly disagree rely on this source for information in disaster. While 54.2% of those who strongly agree that they receive social support rely on news organizations, 42.1% of those who strongly disagree rely on this source. It is obvious that those who receive a great deal of support from family, friends, and/or neighbors are more likely to rely on this same source for information, and less on news organizations. This cross tab for primary information source used in disasters by level of perceived social support has a Pearson $\chi 2$ value = 27.21 (df = 12, n = 536), with an effect size (eta) η = .19.

Table 8.9: Most Important Information Source in Disaster by Total Memberships

Source of Evacuation Information	Total Number of Voluntary Memberships			
	1	2	3	**Total**
Government announcement or warning	21.4 (95)	22.5 (29)	26.6 (21)	22.2 (145)
Family, friends or Neighbors	12.4 (55)	9.3 (12)	6.3 (5)	11.0 (72)
News organization	52.9 (235)	50.4 (65)	45.6 (36)	51.5 (336)
Some other organization, like the Red Cross	4.5 (20)	5.4 (7)	6.3 (5)	4.9 (32)
Other	8.8 (39)	12.4 (16)	15.2 (12)	10.3 (67)
Total	100.0 (444)	100.0 (129)	100.0 (79)	100.0 (652)

Table 8.9 presents the influence of number of organizational memberships on the respondent's most important source of information for finding out what will happen in a disaster. As would be expected, as the number of voluntary group memberships increases, so does reliance on government announcements or warnings. For those with 1 organizational membership, 21.4% of respondents rely on government announcements and warnings, while for those with 3 or more memberships, 26.6% of respondents rely on government sources of information. The same is true for other organizations including the American Red Cross. The opposite pattern

exists in reliance on family, friends, or neighbors, with only 6.3% of those with 3 or more memberships relying on this source of information. These results are of practical significance given that voluntary organizations such as the American Red Cross and nonprofit organizations such as governmental agencies tend to have more accurate and extensive information on what is likely to happen in impending disasters. Reliance on family, friends, and neighbors, while useful in estimating what will happen in the immediate neighborhood, is not as helpful a source of information as are large organizations with a mandate to provide disaster services and/or evacuation warnings. Though these differences are not statistically significant, the effect size (eta) $\eta = .11$ and (phi) $\Phi = .11$ as well.

IX. FINDINGS: PERCEIVED RISK AND VULNERABILITY

The concept of risk is often used to identify the probability of harm associated with some activity or technology. However, as scholars have noted, estimating risk involves inherently subjective elements (e.g., Slovic, 1987, 2003). In a very general sense, prior research has shown that perceived risk and context-specific characteristics *within* a single issue area, such as the siting of hazardous -waste facilities, are significant predictors of attitudes on policy issues (e.g., Lober, 1996). The findings of this prior research are relevant to emergency management and disaster issues: the particular nature of the event may matter a great deal to how individuals are likely to react to a warning or to household preparedness in an emergency context. For example, risk perceptions might vary greatly between a flood or a chemical spill, and making planning assumptions for future behavior on the part of the public should take those different risk perceptions into account. For our purposes, we note that there are findings in prior research studies that perceived risk is a strong predictor of disaster evacuation behavioral choices (see Riad, Waugh, and Norris 2001).

In this section, we attempt to assess the degree to which there are differences in perceived risks associated with disasters and disaster evacuations, and what that might mean in terms of past or future behavior. Among other things, respondents were asked two key questions about perceived risk and vulnerability, including: "If you were told to evacuate because of a disaster, how likely do you think it is that you would be seriously harmed, physically or mentally, during the evacuation?" And "If you had to shelter in your home for several days during a disaster, and there was loss of power during that time, how likely do you think it is that you would be seriously harmed?" Questions on perceived risk and vulnerability are examined for a number of subgroups in the study, including characteristics of their disabilities, hazard type, rural versus urban settings, and social networks.

Table 9.1: If Told to Evacuate, Likelihood of Serious Harm by ADL Assessment

Likelihood of Serious Harm	Limitations on Activities by ADL Assessment			
	No Disability Reported	Minimal Impact on ADL	Moderate Impact on ADL	Significant Impact on ADL
Very Likely	4.3 (14)	9.8 (22)	11.1 (25)	23.3 (68)
Somewhat Likely	16.1 (53)	19.6 (44)	33.3 (75)	26.7 (78)
Somewhat Unlikely	27.1 (89)	32.4 (73)	30.2 (68)	31.2 (91)
Very Unlikely	52.6 (173)	38.2 (86)	25.3 (57)	18.8 (55)
Total	100.0 (329)	100.0 (225)	100.0 (225)	100.0 (292)

Chi Square = 127.77, (9 d.f.), p < 0.001, Gamma = -.367
Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

Table 9.1 shows the cross tabs between the expectation of serious harm if told to evacuate versus disability impact on activities of daily living. This table shows that for those with no disability reported, only 4.3% and 16.1% consider evacuation "very likely" or "somewhat likely" to cause serious harm versus 23.3% and 26.7% of those with significant impact on ADLs, respectively. Clearly, the larger the impact of disability on a respondent's daily activities, the higher the perceived threat of harm from evacuation.

Table 9.2: If Told to Evacuate, Assessment of Likelihood of Serious Harm by Number of Disabilities per Household

Likelihood of Serious Harm	Number of Disabilities per Household			
	No Disability Reported	1 Disability Reported	2 Disabilities Reported	3 or Greater Disabilities Reported
Very Likely	4.2 (14)	14.8 (57)	14.7 (34)	19.9 (32)
Somewhat Likely	16.2 (54)	23.3 (90)	29.9 (69)	31.7 (51)
Somewhat Unlikely	27.3 (91)	30.1 (116)	32.0 (74)	30.4 (49)
Very Unlikely	52.3 (174)	31.9 (123)	23.4 (54)	18.0 (29)
Total	100.0 (333)	100.0 (386)	100.0 (231)	100.0 (161)

Chi Square = 97.77, (9 d.f.), p < 0.001, Gamma = -.326
Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

Table 9.2 shows the relationship between the expectation of serious harm if told to evacuate versus number of disabilities reported in the household. Again, like Table 9.1, this table demonstrates that as the number of disabling conditions increases by household, the perceived threat of harm due to evacuation increases. For those with no disability, 4.2% and 16.2% think that an evacuation is "very likely" or "somewhat likely" to cause serious harm compared to 19.9% who think that evacuation is "very likely" and 31.7% who think evacuation is "somewhat likely" to cause harm of those with 3 or more disabilities.

Table 9.3: If Told to Evacuate, Likelihood of Serious Harm in Evacuation by Presence of Disability

Likelihood of Serious Harm	Presence of Disability	
	Disability Present	No Disability Present
Very Likely	15.5 (122)	4.3 (14)
Somewhat Likely	26.8 (211)	16.1 (53)
Somewhat Unlikely	31.1 (245)	27.1 (89)
Very Unlikely	26.6 (210)	52.6 (173)
Total	100.0 (788)	100.0 (329)

Chi Square = 82.00, (3 d.f.), p < 0.001, Gamma = .446
Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

Table 9.3 shows the expectations of harm for respondents if they were to evacuate if told to do so by the presence of disabilities. For those with no disability, 4.3% and 16.1% report that it is "very likely" or "somewhat likely" that they will come to serious harm during evacuation, compared to 15.5% who think that evacuation is "very likely" and 26.8% who think evacuation is "somewhat likely" to cause harm of those with 3 or more disabilities. The cross tab for this table is statistically significant at better than the 99.9% level of confidence and Pearson $\chi 2$ value = 82.00 (df = 3, n =1117), with a Gamma $\boldsymbol{\gamma}$ = -0.466.

Table 9.4: Serious Harm if Shelter-in-Place by ADL Assessment

Likelihood of Serious Harm	Limitation on Activities per ADL			
	No Disability Reported	Minimal Impact on ADL	Moderate Impact on ADL	Significant Impact on ADL
Very Likely	3.8 (13)	10.4 (24)	16.7 (38)	32.5 (96)
Somewhat Likely	15.2 (52)	22.6 (52)	28.2 (64)	26.8 (79)
Somewhat Unlikely	22.2 (76)	27.4 (63)	32.2 (73)	26.1 (77)
Very Unlikely	58.9 (202)	39.6 (91)	22.9 (52)	14.6 (43)
Total	100.0 (343)	100.0 (230)	100.0 (227)	100.0 (295)

Chi Square = 208.76, (9 d.f.), p < 0.001, Gamma = -.466. Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

Table 9.4 shows the expectation of harm for respondents if they were to shelter in place by their activities of daily living limitation level. For those with no disability, 3.8% report that it is "very likely" that they will come to serious harm if sheltered in place and 15.2% report that it is "somewhat likely" that they will come to serious harm. Compared to respondents whose disability has a significant impact on their activities of daily living, 32.5% report that it would be very likely for serious harm to come to them, and 26.8% report that it would be "somewhat likely" that serious harm would come to them if sheltered in place. The cross tab for this table is statistically significant at better than the 99.9% level of confidence and Pearson $\chi 2$ value = 208.76 (df = 9, n =1095), with a Gamma γ = -.466.

Table 9.5: Serious Harm if Shelter-in-Place by Disabilities per Household

Likelihood of Serious Harm	Disabilities per Household			
	No Disability Reported	1 Disability Reported	2 Disabilities Reported	3 or Greater Disabilities Reported
Very Likely	3.7 (13)	17.0 (67)	20.3 (47)	31.5 (51)
Somewhat Likely	15.0 (52)	23.9 (94)	28.1 (65)	28.4 (46)
Somewhat Unlikely	23.1 (80)	29.3 (115)	29.4 (68)	23.5 (38)
Very Unlikely	58.2 (202)	29.8 (117)	22.1 (51)	16.7 (27)
Total	100.0 (347)	100.0 (393)	100.0 (231)	100.0 (162)

Chi Square = 162.53, (9 d.f.), p < 0.001, Gamma = -.409. Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

Table 9.5 shows that for those households with no disability, 3.7% report that it is "very likely" that they will come to serious harm if sheltered in place and 15.0% report that it is "somewhat likely" that they will come to serious harm. Compared to households with 3 or more disabilities reported, 31.5% report that it would be "very likely" for serious harm to come to them, and 28.4% report that it would be "somewhat likely" that serious harm would come to them if sheltered in place. The cross tab for this table is statistically significant at better than the 99.9% level of confidence and Pearson $\chi 2$ value =162.53 (df = 9, n =1133), with a Gamma γ = -.409.

Table 9.6: Serious Harm if Shelter-in-Place by Presence of Disability

Likelihood of Serious Harm	Presence of Disability	
	Disability Present	No Disability Present
Very Likely	20.6 (164)	3.8 (13)
Somewhat Likely	25.8 (205)	15.2 (52)
Somewhat Unlikely	28.6 (228)	22.2 (76)
Very Unlikely	25.0 (199)	58.9 (202)
Total	100.0 (796)	100.0 (343)

Chi Square = 137.51, (3 d.f.), p < 0.001, Gamma = .551
Note: Table displays column percentages; frequency counts for each cell are shown in parentheses

Table 9.6 shows the expectation of serious harm to respondents, comparing respondents in households with and without the presence of disabilities. For households with no disabilities present only 3.8% and 15.2% report that it is "very likely" or "somewhat likely" that they will come to serious harm if sheltered in place. Compared to respondents with disabilities present, those figures jump to 20.6% who feel harm is "very likely" and 25.8% who feel that harm is "somewhat likely." The pattern of higher perceptions of risk for persons with disabilities holds across all indicators, Tables 9.1-9.6. The cross tab for this table is statistically significant at better than the 99.9% level of confidence and Pearson $\chi 2$ value =137.51 (df = 3, n =1139), with a Gamma γ = .551.

X. FINDINGS: USE OF PERSONAL CARE ASSISTANCE AND EVACUATION BEHAVIOR

The social support networks of persons with a disability can be an important source of help and information during an evacuation, and in preparing for evacuation. A caregiver will act to provide additional channels of information and support to a person with a disability. Caregivers may also be in personal contact with numerous people or organizations outside of the household. The tables in this section are consistent with this description of the importance of using a caregiver for assistance with daily activities.

It is possible that a third variable, the impact of the disability on activities of daily living is a confounding variable in the relationships depicted below. Those respondents who use a caregiver, and rely on this caregiver on a more frequent basis, are likely to have a disability which has a more severe impact on ADLs. When we control for that, however, as shown in Tables 10.7a through 10.7c, only one of the crosstabs below is no longer statistically significant. This crosstab is in Table 10.2. Though the relationships shown in the other tables demonstrate a decrease in statistical significance, none of the other crosstabs becomes non-significant when ADL is controlled for. The positive relationships between use of caregiver or frequency of use, on the one hand, and other variables which facilitate evacuation, on the other, is not due solely to the influence of a third variable, which is level of impact of the disability on activities of daily living.

10.1: Had to Leave Home by Assistance with Daily Activities

Had to leave home because of a disaster?	**Respondent Reports Needing Assistance with Daily Activities**		
	Yes	No	**Total**
Yes	75.3 (271)	59.5 (257)	66.7 (528)
No	24.7 (89)	40.5 (175)	33.3 (264)
Total	75.3 (271)	59.5 (257)	66.7 (528)

This crosstab shows that respondents who use a caregiver for daily activities are more likely to be prepared to evacuate their homes. Of those with caregivers, 75.3% are prepared to leave their homes, while only 59.5% of those with no caregiver are prepared to leave. The cross tab for this table is statistically significant at better than the 99.9% level of confidence and has a Pearson $\chi 2$ value =22.02 (df = 1, n = 792), with an effect size (eta) η = .17. This table indicates that use of a caregiver for assistance with daily activities shows a strong positive correlation to

household preparedness to evacuate. An additional fifteen percent of respondents using a caregiver were prepared, in comparison with those not using a caregiver for assistance.

Table 10.2: Have Resources by Assistance with Daily Activities

Had adequate resources?	Respondent Reports Needing Assistance with Daily Activities		
	Yes	No	**Total**
Not Prepared At All	19.3 (69)	11.0 (47)	14.8 (116)
Not Very Well Prepared	13.7 (49)	9.8 (42)	11.6 (91)
Somewhat Prepared	37.0 (132)	34.8 (149)	35.8 (281)
Well Prepared	30.0 (107)	44.4 (190)	37.8 (297)
Total	100 (357)	100 (428)	100 (785)

Unlike the results in Table 10.1, Table 10.2 above shows that those respondents who use a caregiver for themselves or a family member are slightly less capable to care for themselves at home, if they needed to shelter in place. For those with a caregiver, 30% consider themselves well prepared to shelter in place, compared to 44.4% of those with no caregiver.. The cross tab for this table is statistically significant at better than the 99.9% level of confidence and has a Pearson $\chi 2$ value =22.70 (df = 3, n = 785), with an effect size (eta) η = .17. It is possible that use of a caregiver is confounded with severity of disability, or impact of the disability on activities of daily living (ADL).

Table 10.3. Evacuation Choice by Assistance with Daily Activities

Evacuation Choice	Respondent Reports Needing Assistance with Daily Activities		
	Yes	No	**Total**
Yes	82.8 (193)	64.3 (153)	73.5 (346)
No	17.2 (40)	35.7 (85)	26.5 (125)
Total	100.0 (233)	100.0 (238)	100.0 (471)

Table 10.3 shows a large difference among respondents using a caregiver, and those not using a caregiver for assistance for with daily activities. Those using a caregiver are much more likely (82.8% versus 64.3%) to have evacuated during a recent disaster. The cross tab for this table is statistically significant at better than the 99.9% level of confidence and has a Pearson $\chi 2$ value =20.77 (*df* = 1, *n* = 471), with an effect size (eta) η = 0.21. These results are consistent with those in Table 10.1 because use of a caregiver is also strongly positively related to household preparedness to evacuate. Caregivers providing assistance with daily activities are likely to be of assistance during long-term and immediate preparation to evacuate.

Table 10.4 Most Important Reason for Evacuation by Frequency of Assistance

Reason for Evacuation	Frequency of Assistance						
	Around the clock	Several times a day	Once a day	Several times a week	Once a week	Other	Around the clock
Friend, Family Advice	7.1 (4)	19.1 (9)	0.0 (0)	13.9 (5)	0.0 (0)	13.3 (2)	7.1 (4)
Neighbors Leaving	0.0 (0)	0.0 (0)	0.0 (0)	5.6 (2)	33.3 (1)	0.0 (0)	0.0 (0)
Too Dangerous	58.9 (33)	42.6 (20)	38.7 (12)	27.8 (10)	33.3 (1)	40.0 (6)	58.9 (33)
Government Warning	32.1 (18)	34.0 (16)	45.2 (14)	38.9 (14)	33.3 (1)	33.3 (5)	32.1 (18)
Other	1.8 (1)	4.3 (2)	16.1 (5)	13.9 (5)	0.0 (0)	13.3 (2)	1.8 (1)
Total	100.0 (56)	100.0 (47)	100.0 (31)	100.0 (36)	100.0 (3)	100.0 (15)	100.0 (188)

This table shows the differences why people decided to evacuate by the frequency of use of a caregiver or personal care assistant. The more frequently a personal care assistant is used in the household, the more likely the respondent is to report that it was too dangerous to stay and shelter in place. The less frequently a personal care attendant is used, the more likely the respondent is to report heeding a government evacuation warning. The cross tab for this table is statistically significant at better than the 99.9% level of confidence and has a Pearson $\chi 2$ value =47.71 (df = 20, n = 188), with an effect size (phi)φ = 0.50. Caregiver use for assistance in daily activities is probably associated with influence on the respondent's risk assessment by their caregiver.

Table 10.5: Likelihood of Disaster by Assistance with Daily Activities

Likelihood of Disaster	Respondent Reports Needing Assistance with Daily Activities		
	Yes	No	**Total**
Very likely	32.3 (114)	20.6 (85)	26.0 (199)
Somewhat Likely	35.4 (125)	35.7 (147)	35.6 (272)
Somewhat unlikely	17.6 (62)	21.6 (89)	19.7 (151)
Very unlikely	14.7 (52)	22.1 (91)	18.7 (143)
Total	100.0 (353)	100.0 (412)	100.0 (765)

Table 10.5 indicates that those respondents using a caregiver for themselves or another household member tend to estimate the risk of a disaster as much higher than those respondents without a caregiver. While 32.3% of those using a caregiver believe that a disaster is very likely in the next year, only 20.6% of those not using a caregiver see a disaster as likely. Though 14.7% of respondents using a caregiver believe a disaster in the next year is very unlikely, 22.1% of those not using a caregiver believe a disaster is unlikely. The cross tab for this table is statistically significant at better than the 99.9% level of confidence and has a Pearson $\chi 2$ value = 17.02 (df = 3, n = 765), with an effect size (eta) η = 0.14. Caregivers providing assistance in activities of daily living are likely to influence the perception of greater risk from disasters, while those without caregivers are less likely to receive reliable information on disaster risk and occurrence.

Table 10.6: Likelihood of Serious Harm if Shelter-in-Place by Assistance with Daily Activities

Likelihood of Serious Harm	Respondent Reports Needing Assistance with Daily Activities		
	Yes	No	**Total**
Very likely	28.7 (103)	14.1 (60)	20.8 (163)
Somewhat Likely	28.4 (102)	23.5 (100)	25.8 (202)
Somewhat unlikely	27.0 (97)	29.6 (126)	28.4 (223)
Very unlikely	15.9 (57)	32.7 (139)	25.0 (196)
Total	100.0 (359)	100.0 (425)	100.0 (784)

Table 10.6 has a similar pattern of responses as Table 5 above. More than 57 percent of those who use a caregiver think that it is very or somewhat likely that they may be seriously harmed if they sheltered in place during a disaster. This is compared to only 37.6 percent of persons who do not use a caregiver who think they would be seriously harmed. The cross tab for this table is statistically significant at better than the 99.9% level of confidence and has a Pearson $\chi 2$ value =44.20 (df = 3, n = 784), with an effect size (eta) η = 0.24. Similar to most of the earlier tables in this section, respondents using a caregiver for assistance with daily activities are more likely to perceive that a disaster would cause serious harm if the respondent sheltered at home. It is possible that severity of disability is a confounding variable in this relationship, such that respondents with more severe disabilities understand that they are more easily injured that those with mild or no disability. However, given the results of the tables above, having social and other support from a caregiver seems to influence respondents' perception of risk.

Table 10.7a: Plan to Stockpile Medications by Assistance with Daily Activities Controlled for Minimal Impact on ADL

Plan to Stockpile Medications	Respondent Reports Needing Assistance with Daily Activities		
Control for Minimal Impact on ADL	Yes	No	**Total**
Yes	93.1 (27)	77.6 (104)	80.4% (131)
No	6.9 (2)	22.4 (30)	19.6% (32)
Total	100.0% (29)	100.0 (134)	100.0 (163)

Tables 10.7a-10.7c address the question "Could we be confounding the effects of caregiver use on household capacity with the level of impact of a person's disability on ADL"? This is a reasonable question given we would expect that use of a caregiver and more frequent use of a personal care assistant implies more significant impact of one's disability on ADL. The level of impact of the disability on activities of daily living is removed from the picture if households using a caregiver and households not using a caregiver are compared but only within level of impact on ADL. As shown above, comparisons are made first for those whose disability has a minimal impact, next a moderate impact, and finally a significant impact. Comparing the percentages of respondents on preparedness for a medication supply can now show the effects of using a caregiver or personal care attendant on preparedness, without confounding level of impact on ADL with caregiver use. The above tables show that use of a caregiver in the household is strongly and positively related to having an available supply of medication in an evacuation. After controlling for impact on ADL, caregiver use and a medication supply for evacuation are positively related, with a Pearson's r = .16 at better than a 99.9% confidence level.

Table 10.7b: Plan to Stockpile Medications by Assistance with Daily Activities Controlled for Moderate Impact on ADL

Plan to Stockpile Medications	Respondent Reports Needing Assistance with Daily Activities		
Control for Moderate Impact on ADL	Yes	No	**Total**
Yes	87.7 (64)	79.6 (78)	83.0 (142)
No	12.3 (9)	18.4 (18)	17.0 (27)
Total	100.0 (73)	100.0 (96)	100.0 (169)

Table 10.7c: Plan to Stockpile Medications by Assistance with Daily Activities Controlled for Significant Impact on ADL

Plan to Stockpile Medications	Respondent Reports Needing Assistance with Daily Activities		
Control for Significant Impact on ADL	Yes	No	**Total**
Yes	82.6 (157)	68.3 (41)	79.2 (198)
No	17.4 (33)	31.7 (19)	20.8 (52)
Total	100.0 (190)	100.0 (60)	100.0 (250)

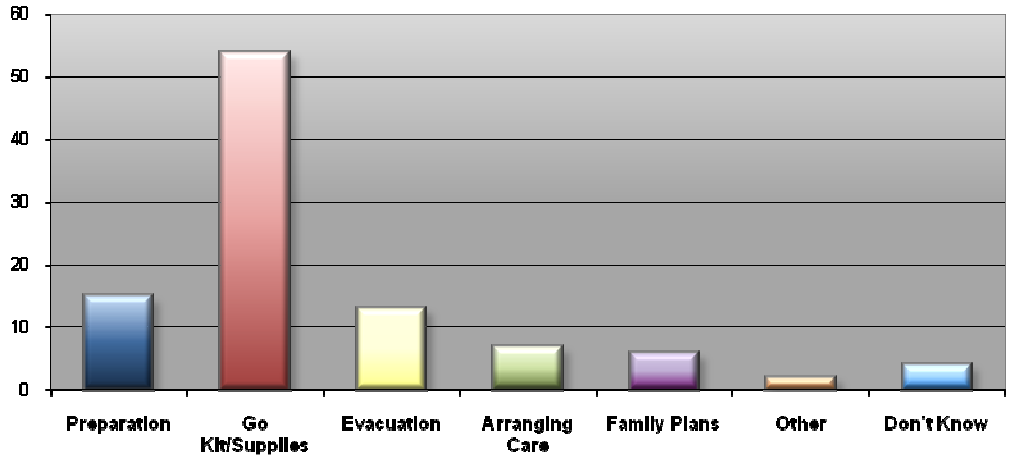
Tables 10.1 through 10.6 in this section show similar results when impact on ADL is controlled for. As shown in Table 10.1, after controlling for impact of disability on ADL, caregiver use and capacity to evacuate are positively related with a Pearson's $r = 0.15$ at better than a 99.9% confidence level. Related to Table 10.2, after controlling for impact on ADL, the more frequently a personal care attendant was used, the more likely was the respondent to report being well prepared to shelter in place. In Table 10.3, when impact on ADL is controlled for (as in Tables 10.7a – 10.7c) those households using a personal care attendant were more likely to report evacuating during a disaster, with a Pearson's $r = 0.18$, with better than a 99.9% level of confidence. After controlling for impact on ADL, the Pearson's r remains statistically significant at $p < .02$ instead of $p < .001$. Similar to the results from Table 10.6, after controlling for impact of ADL, the frequency of use of a personal care attendant is positively related to the estimation of risk of serious harm in a disaster. These results, obtained after controlling for ADL, show that use of a caregiver, and frequency of use of a personal care attendant, are positively related to a variety of capacity and risk assessment variables at a high level of confidence.

XI. FINDINGS: QUALITATIVE ASSESSMENT OF INDIVIDUAL BEHAVIOR AND PERCEPTIONS

Survey respondents were asked the question, "What is the single most important thing you would suggest to persons with disabilities about preparing for a disaster or evacuation?" A total of 982 (85 percent) of persons responded, making 1,647 suggestions for how persons with disabilities could be better prepared for disaster or evacuation. What is especially valuable about these suggestions are that they were elicited from respondents without any set category for response. Thus these are suggestions generated for persons with disabilities 'in the very own words' of persons with disabilities and their household members.

Written suggestions ranged from a single word or phrase to several sentences. Each were read for content and then assigned a category generated by the data. Essentially, if enough people said the same thing, it generated a category of response. Exactly 982 persons generated 1647 coded responses, which fell into one of the following categories: 248 (15 percent) were suggestions regarding emergency preparation, 887 (54 percent) were emergency/go kit supply suggestions, 216 (13 percent) were suggestions for safe evacuation, 112 (7 percent) were suggestions for arranging care, 99 (6 percent) were suggestions for planning specific to family, and 60 (4 percent) made suggestions that fell into a collapsed category called "other." Twenty-five persons (2 percent) stated that they did not know how best to prepare or what suggestions to make for another person with a disability. See Figure 10.1 below.

Figure 10.1 Major Categories of Qualitative Suggestions, in Percent (n=1647)

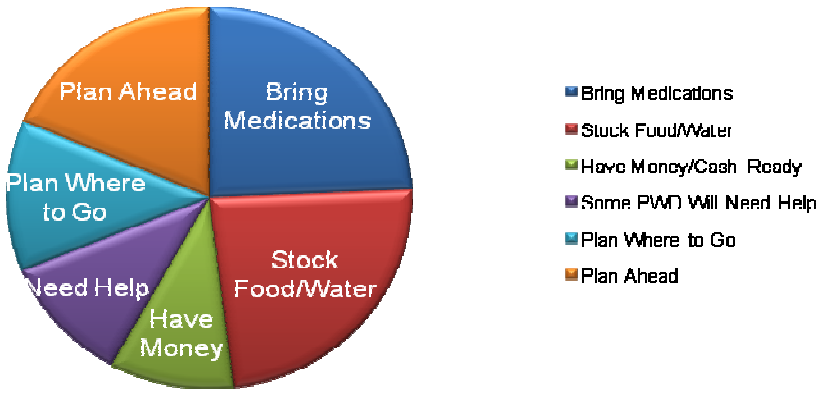


Top Six Suggestions Made

Of all suggestions made, six stood out in terms of highest number of responses. The top six specific suggestions made to other persons with disabilities included to: (1) bring medications or prescriptions (206 responses), (2) stockpile food and water (201 responses), (3) plan ahead (156 responses), (4) plan where to go and make sure the location will accommodate your needs (109 responses), (5) make sure that you arrange for help or assistance if it is needed (91

responses), and finally (6) keep money, or better cash, available in case of emergency (84 responses). See Figure 10.2 below.

Figure 10.2 Top Six (6) Specific Emergency Preparedness Suggestions for Persons with Disabilities



Suggestions for Emergency Preparation

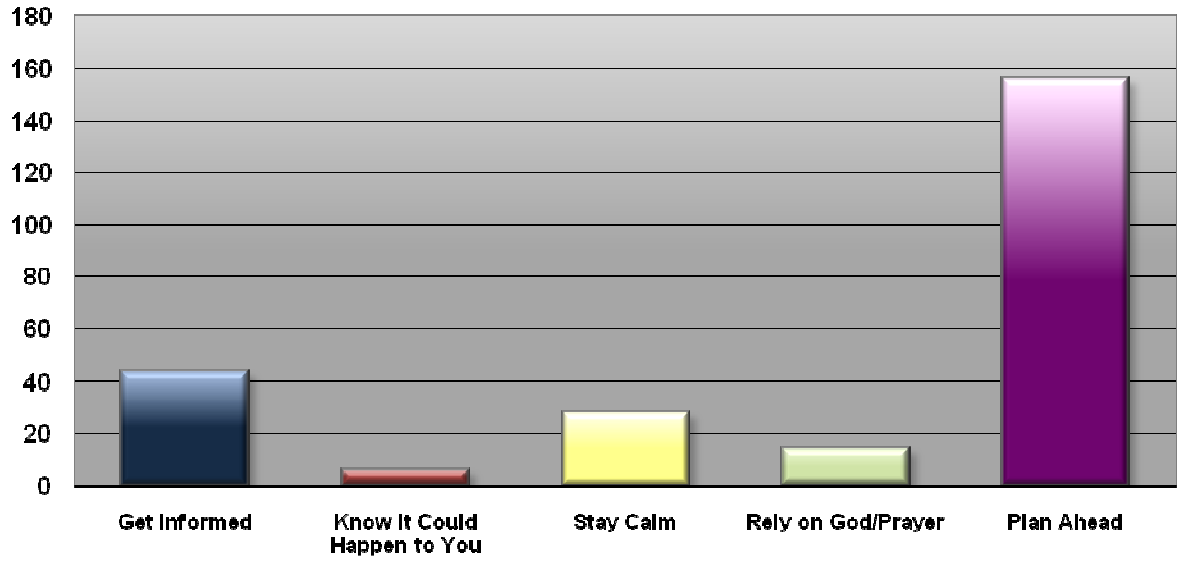
Approximately 236 survey respondents made 248 suggestions regarding how persons with disabilities can best prepare for disaster or evacuation. The largest majority of comments (156 responses) stated simply some variation of "be prepared" or "plan ahead." Respondents felt that persons with disabilities relied more critically on specific items, such as medications or need for alternative heating, lighting and cooling, and that persons with disabilities often required more time to evacuate. For this reason, one of the most prominent suggestions by respondents was to "plan ahead." Given that much of the emergency preparedness public awareness campaigns rely on similar messages, this most likely speaks to the effectiveness of these campaigns recommending early preparation. It also highlights the importance of further messages that specifically detail the most effective ways to prepare.

> ***Text Box 10.1. Persons with Disabilities Must Prepare in Advance***
>
> "Prepare in advance; keep bags of medical supplies and meds ready at all times. It takes so much longer [for persons with disabilities] to evacuate than average people. No time when event happens to plan everything." – Household member of person with cognitive disability in Florida
>
> "Plan early. If your expectation is that the likelihood is that you have to leave the area, then it's a good idea to plan ahead of time if you have friends who need to put you up for a while." – Elderly respondent from Louisiana

In addition to early planning, 44 respondents stressed the importance of getting informed and knowing where to go for information both before and during a disaster event. Eleven percent recommended staying calm, 8 recommended relying on God or prayer to get through a disaster event and another 6 recommended preparing intellectually for an event. As an elderly respondent from California

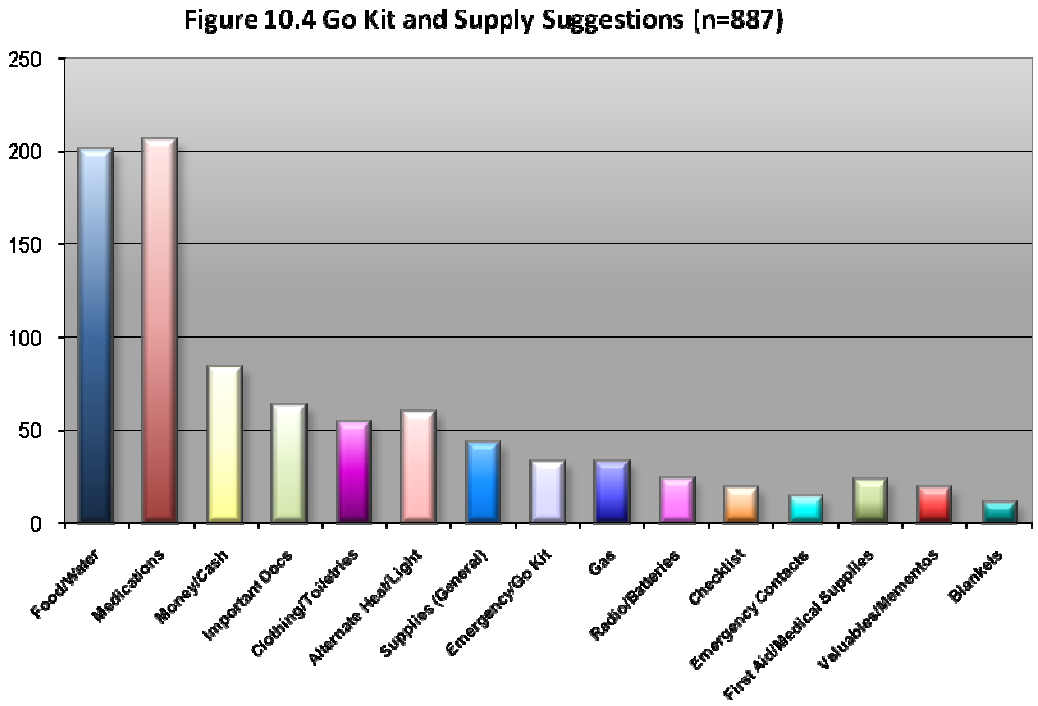
stated, “realize that it could happen, and decide exactly what you are going to need.” See Figure 10.3 and Text Box 10.1.

Figure 10.3 Suggestions for Making Emergency Preparations (n=248)



Go Kit and Emergency Supply Suggestions

The largest group of respondents (54 percent of all responses) made suggestions about what to stockpile and what to gather for an effective emergency or go kit. Of those who made go kit/supply suggestions, 206 recommended bringing medications and 201 recommended stockpiling food/water. Most of the supply suggestions were emergency supplies that would be important for any household. For sheltering-in-place, these suggestions included stockpiling food/water (and specifically non-perishable food); radio and extra batteries; a generator for when the electricity is out and alternate heating, light and cooking supplies, such as blankets, flashlights, and sterno cans. For emergency supplies specific to evacuation, this included bringing important documents, such as identification and insurance papers; making sure you have enough gas in the car; a list of emergency contacts; clothing and essential toiletries; and any valuables or mementos that you would not want to lose. See Figure 10.4.



There were also a number of suggestions that were specific to persons who are elderly or persons with disabilities. Clearly, medications, food and water are a critical part of any emergency kit for the home or in the event of an evacuation. For persons with disabilities, special diets and certain prescriptions may be critical. More than one-quarter of all suggestions were to bring medications or prescriptions and food or water during evacuation. Some gave tips on stockpiling medications for such an emergency. Stockpiling extra medications is not, however, always possible for those who have 30-day limitations on their prescription plans. See Text Box 10.2.

Text Box 10.2 Medications Are Often Critical for Persons with Disabilities Yet There are Restrictions on Stockpiling

"An individual should be permitted to keep an emergency supply of necessary medication on hand at all times, but pharmacies do not permit it. For example, [my plan] allows a 30 day supply only." – Multiple disability household in West Virginia

"We worry about medication and moving ourselves around." – Household member from Missouri

Text Box 10.3 Persons with Disabilities May Have Limited Income, Limited Resources

"Don't have enough money for long stays away from home." – Person with a cognitive disability in Missouri

"Have a separate budget for emergency supplies." – Elderly respondent from Texas

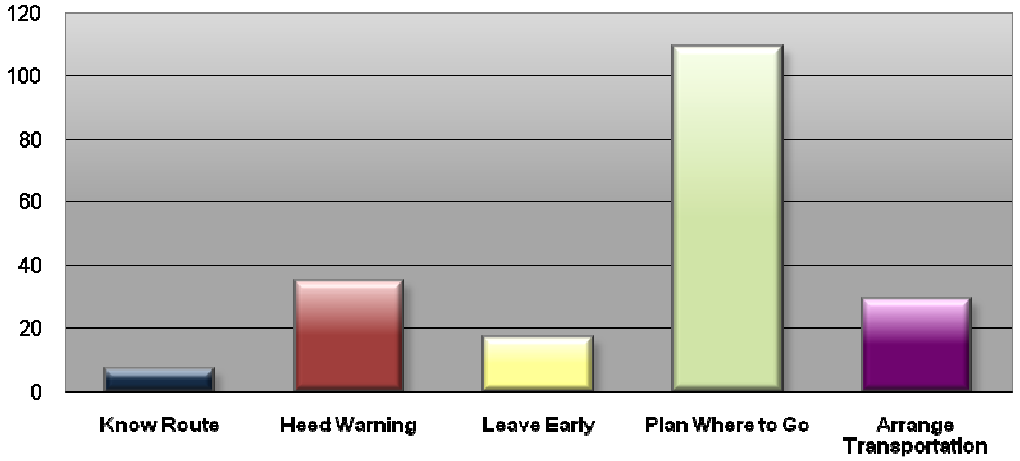
"I didn't have transportation so I couldn't take anything with me." – Multiple disability household in California

Medical supplies and equipment also made the list, which included suggestions to bring key items such as Depends, bathroom chairs, and oxygen tanks. Also on the list were alternate means for cooking, heating and cooling. It was mentioned by more than one person that if your medications require refrigeration that either a generator or a way to keep ice, particularly during evacuations, is critical. Finally, a number of respondents (84 respondents) recommended either saving money specifically for emergencies or keeping some cash on hand in the event of an emergency or major disaster. Persons who are elderly and persons with disabilities are often on fixed incomes, meaning that they have limited income and some have limited access to transportation in the event of an evacuation. See Text Box 10.3.

Evacuation Suggestions

Over 13 percent of responses (216 responses total) were specifically in the area of suggestions for safe evacuation. The largest majority of evacuation suggestions (109 responses) included suggestions for planning or researching a disability-friendly destination either with friends, relatives, or some other public shelter. Several responses suggested the importance of leaving early for any evacuation (17 respondents), heeding the warnings to evacuate (35 respondents) and arranging transportation (29 respondents) by either keeping gas in the car for such emergencies or for those without transportation, arranging a ride with friends or relatives prior to any evacuation. Seven respondents suggested the importance of knowing your evacuation routes. See Figure 10.5.

Figure 10.5 Evacuation Suggestions (n=216)



Most of the evacuation suggestions were about planning where you should go. Among these, a number of respondents expressed concern about shelters. For those who do not have access to a disability-friendly environment through family or friends, it becomes critical that shelters can adequately address their needs. Respondents in Louisiana and Florida (a state with long-term experience sheltering persons who are elderly and disabled) suggested that shelters may not be prepared to handle needs of persons with severe disabilities. Clearly, concern or uncertainty about the destination of evacuation will have an impact on whether someone with a significant disability is going to evacuate. See Text Box 10.4.

Time spent travelling during an evacuation can be stressful and uncomfortable for some persons with disabilities and can seriously impact health and wellbeing for others with more significant disabilities. This is probably why many suggested heeding the warnings to evacuate and leaving as early as possible if you are going to evacuate. See Text Box 10.5.

Text Box 10.4 Will Shelters Adequately Address Needs of Persons with Disabilities?

"Must have shelter information where non-mobile people, wheelchair etc can go [I] do not know of any place in St. Charles County." – Person with mental illness in Missouri

"Don't depend on shelters! You won't be let in!" – Person with a medical disability in Louisiana

"Make sure you have an accessible place to go. Most shelters are not set up for severe disability needs." – Person with a medical condition in Florida

Text Box 10.5 Leave Plenty of Time and Heed the Warnings

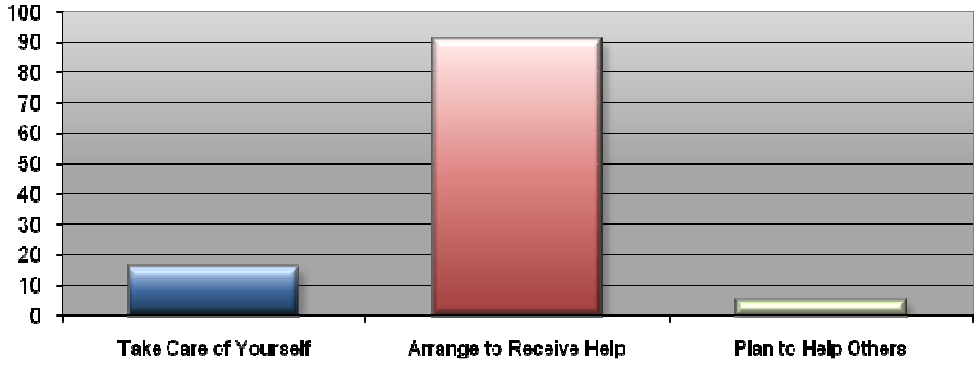
"If you are going to leave, leave early! Don't wait for a mandatory evacuation or you'll spend way too much time sitting on a highway somewhere." – Person with mental illness in Texas

"I would suggest to persons with disabilities is evacuate when the news or people tell you to leave. Better safe than sorry. I want to be where I will be well taken care of in times of need." -- Person with mobility impairment in Florida

Arranging Care in the Event of Disaster

Six percent of all responses (112 responses) spoke to the importance of arranging care either for yourself or someone else. The largest majority (91 responses) suggested that if you are someone with a disability you will need to arrange with someone you trust – either family, friend, or service provider – to receive help in the event of a disaster or evacuation. At least 16 respondents stressed the need for individuals with disabilities to plan to take care of themselves in the event of a disaster or evacuation. Another 5 respondents suggested that if you know of a neighbor in need that you should plan to check in with that person periodically, especially during a disaster, to make sure they are okay. See Figure 10.6.

Figure 10.6 Suggestions for Arranging Care (n=112)



Probably one of the more important points in this segment of responses was the importance of making arrangements for yourself if you know that you will need assistance in a disaster or evacuation. For some persons who are elderly or living with disabilities, this may mean making arrangements that you can rely on with home care employees or neighbors who understand what your needs are. Since service provider employees also have families to take care of, it is important that whatever your arrangement is, that it covers both you and that person's other responsibilities to family. See Text Box 10.6.

Text Box 10.6 Make Arrangements with Someone You Trust

"Have a good company that will still have workers come to your home" – Person with a medical disability from Louisiana

"[Make sure you] have someone by your side that's 100% all the way (a caregiver) – Person with a cognitive disability from Louisiana

There is a certain segment of the disability population that even with support from family, friends, and service providers will need some kind of additional assistance. For that segment of the population, it is important that persons with disabilities can rely on federal, state and local entities for assistance. See Text Box 10.7.

Text Box 10.7 Some Will Need Assistance

"We would hope that we wouldn't have another situation like during Katrina and would suggest to make sure elder people are taken care of whether they are in assisted living or living at home. Please help others, especially the elderly and help with the animals." -- Unidentified respondent from Louisiana

"Those of us without family or friends in the area need to have government or charity intervention for safety." -- Person with a cognitive disability in Missouri

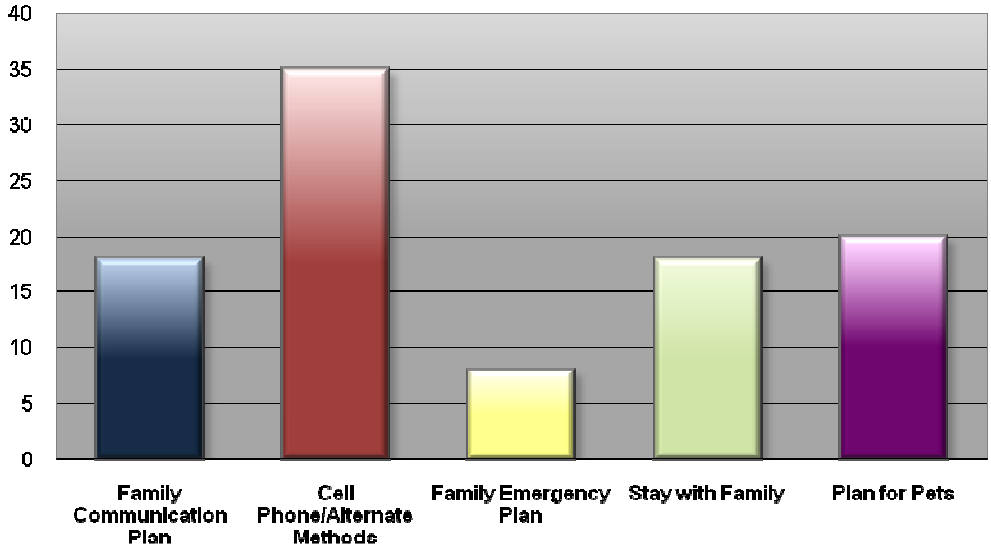
"We need public assistance to come and check on people. We recently had a storm, trees blown down and no one came to check on me. I live in a community where there are lots of retired people." – Person with a cognitive disability in West Virginia

Making Plans with Family

For many persons, family members are the cornerstone of most personal emergency preparedness plans. Six percent of all responses (99 responses) were specific to making family plans. Thirty-five respondents suggested making arrangements for alternative methods of communication. This included bringing a cell phone in the event of evacuation or family members getting separated. This also included several members of the deaf and hard of hearing community that suggested finding alternative ways to communicate with persons who are not familiar with sign language, particularly if the person gets separated from equipment, like TTYs, or family members or providers who can interpret sign language to the hearing community.

Twenty respondents said it is important if you have pets or service animals to make sure that your evacuation plans include a plan for their safety. Eighteen respondents suggested making a plan for how the family is going to get information about each other in the event of an evacuation, particularly if it involves separation of family members. Some suggested designating a place where messages could be received and there was at least one suggestion to leave a note in the home when you evacuate stating where you plan to go. Eight respondents suggested talking to family members ahead of time and making a plan for what you will do as a family. See Figure 10.7.

Figure 10.7 Making Family Plans (n=99)



It was clear that family is an important part of any solid emergency and evacuation planning. Some persons with disabilities were living with and relying on family members to provide support critical to their daily lives. Some had disabilities, such mental retardation or mental illness, which also impacted their ability to relate to outsiders (strangers) from the response community. In these and other cases, it becomes critical that persons with disabilities are not separated from family, particularly during an evacuation. See Text Box 10.8.

Text Box 10.8 Keep Family Together in an Evacuation

"Take the phone with you, so you can listen for further instructions & mom's voice can keep you calm." – Parent of a child with a mobility impairment in Missouri

"Find a friend or family member willing to stick with you and help with things you can't do. With an extra pair of hands or feet anything is do-able." – Person with mental illness in Texas

XII. CONCLUSION: IMPLICATIONS OF THE REPORTED FINDINGS

The results of this individual-level survey of persons with disabilities and their households suggest several areas for further research and attention. The most important results include: (1) the lack of means to evacuate which many households face, (2) the relative lack of household planning and preparedness which persons with hearing limitations report, (3) the relative lack of household planning and preparedness of households in states which have not experienced frequent hurricanes, (4) the greater evacuation needs of persons and/or households with multiple types of disabilities, and (5) social networks offer important resources to aid in preparedness, response and recovery for persons with disabilities.

There is a Greater Need for Financial and Other Resources to Support Evacuation for Persons with Disabilities

From both the quantitative and qualitative findings of this study, it is clear that a majority of persons with a disability either cannot afford or do not have the resources necessary for an evacuation which lasts more than just a few days. Only about one-third of respondents in this study report a household income of $50 thousand or greater, while half of all Americans report having this income or greater. This means that persons with disabilities may lack the financial means to be highly prepared for a disaster, compared to the general population. The more qualitative findings of this study reinforces this finding. Most respondents who offered comments on the most important thing to know about evacuating emphasized the need for funds and for an extensive supply kit including vital prescription medications. This lack of means for evacuation will need to be carefully considered by emergency management, first responder, and disability provider organizations. Evacuation assistance and services for persons with a disability will need to include material or financial evacuation assistance if all households are to be prepared to evacuate in a disaster. The provision of material and financial resources to households with a disability will need to be a significant part of organizational planning for disaster evacuations.

There is a Greater Need for Preparedness for Persons with Hearing Impairments

Given the lower levels of preparedness reported for persons with hearing disabilities, it will be important that special attention be given to organizational preparedness to assist those households that include persons with hearing impairments. This can be achieved by organizational evacuation services which complement the preparedness of persons who are deaf and hard of hearing. In geographic areas with higher numbers of persons with hearing limitations, organizational evacuation plans should include evacuation services focused on the deaf and hard of hearing.

There is a Greater Need for Preparedness in States Not Impacted by Hurricanes

Persons with disabilities and their households in states not impacted by hurricanes are also less likely to be prepared to evacuate. Emergency management and disability service providers in states with floods, wild fires, and industrial disasters will need an even higher level of preparedness to assist persons with disabilities in evacuation, compared to other states. The demands on these organizations are greater given the relatively low level of preparedness of households in these states.

There is a Greater Need for Preparedness in Household with High Rates of Disability

The need for organizational assistance for persons with multiple disabilities is greater than for those households in which a single disability is present. Emergency management and disability services provider organizations will need to work together in a coordinated fashion to be able to meet the specific evacuation needs of persons with multiple disabilities, or households in which one or more members have a different type disability. The results described in this report emphasize the need for a high level of coordination among emergency management, first responder, and disability services provider organizations. Because persons with disabilities have multiple needs during an evacuation (e.g. assistive equipment or animals, medication, an attendant during stay in a shelter), inter-organizational coordination is especially important. Particularly for those with multiple disability conditions, coordination among the networks of disaster services and disability organizations is vital if continuity of care is to be available during an evacuation.

Increasing Access to Social Networks Can Increase Better Preparedness, Response and Recovery for Persons with Disabilities

A richer social network, even when part of that network results from membership in voluntary organizations, is a good predictor of evacuation behavior. A social network with family, a caregiver, and voluntary organizations facilitates the decision to evacuate. The influence of use of a caregiver for assistance with daily activities was found to be particularly important in facilitating evacuation. These results suggest that provision of a personal care assistant from disability services organizations, particularly during an evacuation, is likely to help persons with a disability to accurately perceive disaster risk and have the capacity to evacuate in a disaster. Disability services organizations with personal care assistance programs should be carefully examined to determine how the personal care assistant facilitates the evacuation of persons with a disability and their household.

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APPENDIX A: SAMPLING ISSUES

The standard of sampling in scientific studies is quite rigorous. The goal is to create a sample of research subjects that resemble the overall population in all relevant ways. The favored method for achieving this resemblance is random sampling from a known population. This approach is quite difficult to apply in the social sciences, however. For example, King, Keohane and Verba (1994) state that true random samples are difficult in the social sciences given the populations of interest are not clearly defined. It is not clear who would be on the list of the known population, so it is not clear how closely any sample resembles this population. Even in the most rigorous sampling protocols in the social sciences, researchers have to make significant assumptions about whether all people are available for random selection despite not having a listed phone number, not being reachable by phone during the period of a research study, or not being listed on local voter rolls. To a great extent, sampling from a complete sampling frame is only ever approximated.

Dealing with protected classes greatly complicates these problems with sampling. In the case of special needs populations, we have two major problems with creating a comprehensive list of the known population. First, subjectivity or ambiguity in the term "special needs" makes the eventual list a moving target **(citations)**. Whether the list is complete will depend on what one counts as special needs (All aged populations? Individuals caring for infants? Individuals with impaired sight but not legally blind? etc.). Second, there are significant privacy concerns related to the creation and sharing of any lists of special needs populations. Given the relationship between many special needs and diagnosed medical conditions, appearance on a list of individuals with special needs may constitute a violation of health-related privacy. For this reason, where specific lists exist (say, client lists for organizations serving hearing impaired people) they are not available for outside researchers. As a result of these complications, random sampling from a known list (a design-based approach) is not available as a sampling strategy for this study. Instead, the research team developed a model-based sampling strategy to maximize response rate without knowing the total potential population.

The data used in this study are the product of four successive surveys, three using a purposive sampling approach. A single survey instrument was applied to four different subgroup samples: elderly persons, persons who are customers at Centers for Independent Living, recipients of home and community-based Medicaid waivers, and persons who are deaf or hard of hearing. The first survey sampling one of those subgroups, elderly persons, was completed in the summer of 2008. Measurement for the other three subgroups was completed during the final 2008 quarter. Data collection took place in select regions of seven states where recent large-scale evacuation events have occurred recently, or where there is at least some degree of vulnerability to future events that could precipitate a disaster evacuation. The states included California, Florida, Louisiana, Missouri, North Carolina, Texas and West Virginia.

Initial mailings for the Medicaid-Arc and CILs studies went out in August. Second mailings were done for both the Medicaid-Arc and CILs studies in October. To clarify, the Medicaid-Arc and CILs surveys were mailed to persons who receive services under state Home- and Community-Based Services Medicaid 1915 (c) physical disability and mental retardation/developmental disability waivers, persons who receive services through local Arcs (Medicaid-Arc study) and persons who receive services through local centers for independent living (CILs study). The surveys were not mailed to individual directly by the project team. State agencies and organizations like a local Arc or CIL were requested to distribute the surveys. This was done to

respect confidentiality of the clients or consumers from these service organizations. Acquiring confidential lists was deemed impractical and would have prevented completing the study as designed. Fortunately, the project team had nearly complete cooperation with all organizations that we requested to assist us in distributing the surveys.

As noted in the main text, in October 2008, deaf and hard of hearing surveys were mailed from local deaf and hard of hearing service providers. Like the Medicaid/Arc and CILs surveys, intermediary groups were used to distribute the surveys to specific individuals. The response rate information can be summarized this way: 20.7% for the telephone survey sample; 24.7 for the CILs sample; 20.6% for Medicaid/ARC sample; and 18.0% for the deaf and hard-of-hearing sample.

While the design-based inference described above is a more common approach in social research (Schreuder et al. 2001), using a model-based approach is a superior technique for accessing the population of interest in this study for the reasons stated above (Särndal 1978, Särndal *et al*. 1992) given the limitations of the sample frame. The model-based sampling approach provides some meaningful results. These types of samples are useful for providing accurate assessments of the relationship *between* variables (Manion 1994), and can be useful in inferring qualities of the larger population in specific cases (Särndal 1978, King 1996). In this case, the research design is exploratory by nature. The goal is to identify distinctions between categories of special needs individuals in **[need to elaborate here]**. These inferences depend on having a broad sample of a variety of respondents with different needs. The inferences are not focused on the relative proportion of the various needs in the community and are therefore not as sensitive to inability of the model-based sampling approach to define the full population in advance.

Instead of deriving parametric statements of the accuracy of the sampling approach based on assumptions about the full population and the size of the sampling frame, a model based approach tests the comparability of observed patterns in the data across different sampling techniques. Instead of concluding that one's sample has enough power to reveal patterns because of a relationship between n (sample size) and N (population size) one instead looks for differences in response pattern within the data. If the samples collected from different methods are similar, then those data can be pooled. To the extent that there are differences in the samples collected by various techniques, one must be cautious in interpreting correlations between the characteristics on which there are sampling differences and other characteristics.

The data collected through the model-based approach of this study reveal no significant differences across surveys on demographic factors with the noted exceptions of employment status and duration of residency in the area. These findings are not surprising because these are two statuses that would increase the probability that an individual is reachable through the model-design sampling approach.

Comparison of respondents employment status by source of original survey
(Bonferroni)

Row Mean- Col Mean	elderly	cil's	medicaid
cil's	-.115116 1.000		
medicaid	-.3298	-.214684	

```
        |     0.001      0.221
        |
dear and |   -.626056    -.51094   -.296256
        |     0.000      0.012      0.432
```

Comparison of how long have you lived in your current area? by source of original survey

```
                          (Bonferroni)
Row Mean-|
Col Mean |   elderly       cil's   medicaid
---------+--------------------------------
   cil's |   -1.30675
        |     0.015
        |
medicaid |   -.289773    1.01698
        |     0.000      0.110
        |
dear and |   -.534027    .772727   -.244254
        |     0.000      0.457      0.021
```

Given these differences between the sampling approaches, one should be cautious in inferring the prevalence in the population of employment status and duration of residency. However, these differences need not endanger the various key inferences of the study. For these distinctions to interfere with other inferences, there would need to be a correlation between these variables and both some other independent variables and the dependent variables.

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APPENDIX B. INSTRUMENT USED FOR MAIL SURVEYS

PLEASE NOTE: There were slight variations across (e.g., the deaf and hard-of-hearing survey had several specific items only included in that instrument) . Of further note, the skip patterns built into the mail survey instrument were designed to mirror the telephone survey as closely as possible. The order of questions used in the telephone version of the survey is displayed in Appendix C which provides a comprehensive frequency report for all questions asked of all respondents.

Evacuation for Persons with Disabilities:
A Survey to Promote Planning Solutions for Emergencies and Disasters

To ensure that you receive your $10 gift certificate, we are encouraging participants to complete this survey by calling our toll-free hotline **(1-866-715-2156*)*** by the time and date listed on your invitation letter. Your telephone survey should take approximately 10 minutes and you can use this written survey as a guide during your telephone call. If you prefer, you may instead choose to fill out this written survey and return it in the postage-paid envelope provided by the due date listed in your invitation letter. If you decide to use the written survey, please check the response that best answers each question. Other accessible survey formats are available on request at (202) 338-7153 x208.

Before asking about plans you or others in your household may have made in case of an emergency, we have a couple of preliminary questions:

1.1 Do you or a member of your household have a disability?

[Please choose one answer]

- ☐ I have a disability
- ☐ Someone in my household has a disability
- ☐ Both myself and another household member have a disability
- ☐ No

If you just answered NO to this question, THANK YOU for your time. Unfortunately, you are not eligible to complete our survey at this time.

1.2 Could you tell me what type of disability it is?

[Please select all answers that apply]

- ☐ Medical
- ☐ Mental health
- ☐ Cognitive or intellectual (such as Alzheimer's or mental retardation)
- ☐ Decreased mobility
- ☐ Visual
- ☐ Hearing
- ☐ Other (specify)_____

We are asking people with significant cognitive disabilities to take the survey with someone they know and trust. If that describes your disability, please have someone help you take this survey – or – simply have another member of the household complete the survey. If there is not someone to help, THANK YOU for your time. Unfortunately, you are not eligible to complete our survey at this time.

Section 1 *Household Disaster Preparedness*

Next we would like to ask you questions about what you would do if there was a disaster in your neighborhood or other parts of your community.

1.3 If you had to leave your home for several days or more because of a disaster, like a major flood or hurricane, do you have a specific destination to which you would travel?] Yes] No

1.4 Have you or anyone in your household made specific plans for what you would take with you if you had to leave your home for several days or more because of a disaster?] Yes] No

1.5 Sometimes during disasters, people have to go to public shelters if there is an evacuation. Do you know where a public emergency shelter is located in your area?	] Yes	] No
1.6 Do you, or someone in your household, rely on vital daily prescription medications, such as insulin for diabetes, or something like that?	] Yes	] No
1.7 Do you or someone in your household have a plan to keep an available supply of those medications if you had to leave home for several days or more because of a disaster?	] Yes	] No ☐ Does not apply

1.8 In terms of personal resources, such as transportation, money, and available medical care, how prepared are you to take care of yourself if you had to leave your home for several days because of a disaster?

- ☐ Not at all prepared - don't have the resources to stay away from home
- ☐ Not very well prepared - couldn't make it more than a day or two away from home
- ☐ Somewhat prepared - could make it a few days away from home, but not much longer
- ☐ Well prepared - could make it for a week or more away from home without major problems

1.9 What if you had to remain in your own home for more than a few days during a disaster? Would you say you are:

- ☐ Not at all prepared to stay at home without any help
- ☐ Not very well prepared - couldn't make it more than a day or two at home
- ☐ Somewhat prepared - could make it a few days at home but not much longer
- ☐ Well prepared - could make it for a week or more at home without major problems

1.10 What is the Single Most Important thing you would suggest to persons with disabilities about preparing for a disaster or an evacuation? ***Please write your answer below:***

1.11 If something like a flood or hurricane was about to occur, which of the following is the MOST IMPORTANT source of information you would use to find out what was going to happen?

[Please choose one answer]

- ☐ Government announcement or warning
- ☐ Family, friends, or neighbors
- ☐ News organization
- ☐ Some other organization, like the Red Cross
- ☐ Other (specify) _____

Section 2 *Disaster Evacuation Experiences*

Next, we would like to ask about possible personal experiences with emergencies or disasters that might have occurred in your area.

2.1 In the last several years, has there been a disaster like a hurricane, flood, or a chemical accident, that caused people living in, or near, your neighborhood to have to evacuate the area?] Yes] No

If you answered NO to the above question, please SKIP to the NEXT SECTION in the questionnaire, which is Section 3: Help from Others During a Crisis.

2.2 Did you find out about the evacuation in time to be evacuated?] Yes] No

2.3 How did you learn that an evacuation was taking place?

[Please choose one answer]

- ☐ TV
- ☐ Radio
- ☐ Family/ friend/ neighbor
- ☐ Fire or police came to my door
- ☐ Automated phone call
- ☐ NOAA weather band radio
- ☐ Other (specify) _____

2.4 Did you or someone from your household evacuate from your home?] Yes] No

If you answered NO to this question, please SKIP ahead to Question 2.13

2.5 What was the single MOST IMPORTANT reason you or someone from your household decided to evacuate?

[Please choose one answer]

- ☐ Advice from friends or family
- ☐ Saw that neighbors were leaving
- ☐ Felt it was too dangerous to stay home
- ☐ Followed government evacuation warning
- ☐ Other (specify) _____

2.6 When you evacuated, where did you go? Was it to friends or family, a hotel/motel, public shelter, some other community shelter, or somewhere else?

- ☐ Friends/family
- ☐ Hotel or motel
- ☐ Public shelter
- ☐ Other community shelter, like a church facility
- ☐ Other (specify) _____

2.7 When you evacuated, did you have everything you needed in terms of key resources, such as access to medical care or safe shelter?] Yes] No

2.8 Which of the following statements best describes your most recent evacuation experience?

[Please choose one answer]

- ☐ It went very smoothly – no problems
- ☐ It went OK – you had most things that were needed
- ☐ It didn't go very well
- ☐ You had major problems with lack of items and services

2.9 What supports did you bring for yourself or another household member?

[Please select ALL of the following supports which you brought]

- ☐ A wheelchair
- ☐ Medical equipment (such as oxygen or syringes)
- ☐ Special foods because of dietary restrictions
- ☐ A personal care attendant
- ☐ A service animal
- ☐ None
- ☐ Other (specify) _____

2.10 During the disaster, I received help and support from family, friends, or neighbors.

☐ Strongly agree ☐ Agree ☐ Disagree ☐ Strongly disagree

2.11 In the weeks following your return home, would you say you were better off, worse off, or about the same in terms of your health and physical well-being?

- ☐ Better off
- ☐ About the same
- ☐ Worse off

2.12 After the disaster was over, what was the SINGLE MOST important thing that made recovery difficult?

[Please choose one answer]

- ☐ The financial cost
- ☐ Dealing with the bureaucracy to get help
- ☐ The emotional stress
- ☐ Fear of future disasters
- ☐ Lack of understanding of disability by providers
- ☐ I experienced no major difficulties.

If you just answered the question above, 2.12, you can SKIP the next question and go to Section 3.

2.13 What was the MOST IMPORTANT reason you chose to stay home and NOT evacuate?

[Please choose one answer]

- ☐ No transportation
- ☐ Didn't have enough money to leave
- ☐ Too difficult for me or another household member to travel
- ☐ Didn't know where I would go
- ☐ Felt safer at home
- ☐ Didn't have enough information about the evacuation
- ☐ Didn't think there was too much danger
- ☐ Public shelter facilities cannot accommodate me or household member
- ☐ Other (specify) _____

Section 3 *Help from Others During a Crisis*

Next, we would like to ask you a few questions about your relationships with other people or organizations within your community.

3.1 In general, how much of the time do you trust government to do what is right?

☐ Just about always ☐ Most of the time ☐ Only some of the time ☐ Almost never

3.2 In general, how much of the time do you trust service providers, such as nursing homes or home health agencies, to do what is right?	☐ Just about always	☐ Most of the time	☐ Only some of the time	☐ Almost never
3.3 During a crisis such as an illness or accident, I receive adequate help and support from family, friends or neighbors.	☐ Strongly agree	☐ Agree	☐ Disagree	☐ Strongly disagree

3.4 Some people belong to community groups or volunteer organizations. Do you do volunteer work for, or are a member of, any of the following types of groups?

[Please select all answers that apply]

- ☐ A church or faith-based group
- ☐ A community charitable services group
- ☐ A local civic organization, for example, a rotary club
- ☐ A local seniors center
- ☐ A sports or other recreation group
- ☐ None
- ☐ Other (specify) _____

3.5 When there was an emergency or disaster in your community in the past several years, did you get any help from any of the following types of organizations?

[Please select all answers that apply]

- ☐ A church or faith-based group
- ☐ A civic group, for example, a rotary club
- ☐ Fire or police departments
- ☐ A state or federal government agency
- ☐ A local health care organization
- ☐ Other (specify) _____
- ☐ No help from any community groups
- ☐ There was no recent disaster in my community

Now, we would like to ask a few questions about your health.

3.6 For you or the person with a specific care need in your household: how much does the need for care affect daily activities? Is the effect:

- ☐ Minimal
- ☐ Moderate
- ☐ Significant

3.7 Do you, or a member of your household, use a caregiver for assistance with daily activities such as feeding, clothing, bathing, and so forth? ☐ Yes ☐ No

3.8 How often is that assistance provided?

- ☐ Around the clock
- ☐ Several times a day
- ☐ Once a day
- ☐ Several times a week
- ☐ Once a week
- ☐ Other (specify) _____
- ☐ Does not apply

3.9 Do you, or a member of your household, use any medical devices or service animals for assistance with daily living? ☐ Yes ☐ No

3.10 Of the following, which assistance device or devices is used in your household? *[Please select all answers that apply]*	☐ Walker or cane	☐ Wheelchair	☐ Oxygen tank
	☐ Hearing device	☐ Ventilator	
	☐ Service animal	☐ Other (specify) _____	

Section 4 *Future Disasters*

Next, we would like to ask your thoughts about disasters that might occur in the future.

4.1 How likely do you think it is that a disaster, like a hurricane, flood, or wildfire, will affect your household in the next year?	☐ Very likely	☐ Somewhat likely	☐ Somewhat unlikely	☐ Very unlikely
4.2 If you were told to evacuate because of a disaster, how likely do you think it is that you would be seriously harmed, physically or mentally, during the evacuation?	☐ Very likely	☐ Somewhat likely	☐ Somewhat unlikely	☐ Very unlikely
4.3 If you had to shelter in your home for several days during a disaster, and there was loss of power during that time, how likely do you think it is that you would be seriously harmed?	☐ Very likely	☐ Somewhat likely	☐ Somewhat unlikely	☐ Very unlikely
4.4 How likely do you think it is that if a major disaster strikes your area of the country a large number of people would lose their lives?	☐ Very likely	☐ Somewhat likely	☐ Somewhat unlikely	☐ Very unlikely

Section 5 *nformation about Your Background*

Finally, we would like to ask some general questions about your background.

5.1 First, what is the highest level of education you have completed?	☐ Less than 9th grade	☐ 9th to 12th grade, no diploma
	☐ High school graduate	☐ Some college, no degree
	☐ Associate degree	☐ Bachelor's degree (B.A., B.S., R.N.)
	☐ Graduate or professional degree (M.A., M.S., Ph.D., M.D.)	

5.2 Are you Hispanic or Latino?	] Yes	] No		
5.3 What race or ethnicity are you? *[Please choose one]*	☐ White (Caucasian)	☐ Black or African-American	☐ Asian	☐ American Indian or Alaska Native
	☐ Native Hawaiian or Other Pacific Islander	☐ Multiracial	☐ Other (specify) _____	
5.4 Are you currently employed?	☐ Yes, full-time	☐ Yes, part-time	☐ No	

5.5 In what year were you born? ***Please write your answer:*** 19 _____

5.6 ***Please write your answers below:***

How many people live in your household? _____

How many household members are under 6 years of age? _____

How many household members are adults aged 65 or older? _____

5.7 When it comes to politics, which of these do you consider yourself to be?

☐ Very liberal ☐ Somewhat liberal ☐ Middle of the road ☐ Somewhat conservative ☐ Very conservative

5.8 Do you have any pets?] Yes] No

5.9 How long have you lived in your current location (neighborhood or community)?

☐ Less than two years
☐ Between two and five years
☐ More than five years

5.10 Are you…

☐ Single – never married ☐ Married ☐ Divorced
☐ Living with a partner ☐ Widowed or a widower

5.11 Do you, or the person with the disability in your household, receive any of the following support or benefits?

[Please select all answers that apply]

☐ Social Security Insurance (SSI) ☐ Medicaid waiver services
☐ Medicare ☐ Food stamps
☐ Other (specify) _____

5.12 Which of the following income categories best describes your total annual household income in the last 12 months?

☐ Under $20,000
☐ $20,000 - $29,000
☐ $30,000 - $39,000
☐ $40,000 - $49,000
☐ $50,000 - $59,000
☐ $60,000 - $70,000
☐ $70,000 - $80,000
☐ $80,000 - $90,000
☐ $90,000 - $100,000
☐ 100,000 - $125,000
☐ $125,000 or more

5.13 Please write your 5-digit ZIP code here: ***Please write your answer:*** _____

5.14 In which state do you live?

☐ California ☐ Florida ☐ Louisiana ☐ North Carolina
☐ Missouri ☐ Texas ☐ West Virginia ☐ Other (specify) _____

5.15 What is your gender? ☐ Male ☐ Female

THANK YOU FOR COMPLETING OUR SURVEY

We appreciate you taking the time to help with this survey and would like to send you a $10 gift card as our way of saying "THANK YOU!" for helping improve the protection of persons with disabilities.

To receive your gift card, you can fill out the form below and return it with your survey. Remember: this information is ONLY for the purpose of sending you the gift card. The responses on your survey questionnaire are STRICTLY SEPARATE and we will NOT share your name or information with anyone else. The below form will be separated from your survey as soon as it arrives, so that all of your answers above will remain anonymous. This study is **strictly confidential** and will be used only for the purposes of improving emergency and disaster management practices for persons with disabilities.

FILL OUT AND RETURN WITH SURVEY BY DUE DATE ON THE ATTACHED LETTER TO RECEIVE $10 GIFT CARD:

Name of person who completed the survey:
Street address:
City, State, and ZIP code:
Date you mailed the survey in the post-paid envelope:

WE WILL ONLY BE ABLE TO HONOR OUR COMMITMENT TO GIVE YOU A GIFT CARD IF WE RECEIVE THE SURVEY BY THE DUE DATE LISTED ON YOUR INVITATION LETTER.

IF YOU WANT TO ENSURE THAT YOU MAKE THE DEADLINE, YOU MAY ALSO CHOOSE TO CALL THE TELEPHONE SURVEY LISTED ON YOUR LETTER TO COMPLETE YOUR SURVEY.

APPENDIX C: SURVEY INSTRUMENT FREQUENCIES – OVERALL SUMMARY

PLEASE NOTE: The raw response frequencies presented here in Appendix C are based on the first sampling effort – the telephone survey of elderly adults in the U.S. Therefore, the pattern of frequencies presented below does not correspond exactly to the pattern of questions shown in the version of the instrument sent through the mail. This appendix does provide a complete listing of frequencies for all four survey samples combined.

Q01
Next, let me ask you: if you had to leave your home for several days or more because of a disaster, like a major flood or hurricane, do you have a specific destination that you would travel to?
1 Yes
2 No
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Yes	683	59.08
No	460	39.79
DON'T KNOW	12	1.01
REFUSED	1	0.10
Total	**1156**	**100.00**

Q02
Have you or anyone in your household made specific plans for what you would take with you if you had to leave your home for several days or more because of a disaster?
1 Yes
2 No
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Yes	746	64.31
No	410	35.34
DON'T KNOW	3	0.26
REFUSED	1	0.09
Total	**1160**	**100.00**

Q03:

Sometimes during disasters, people have to go to public shelters if there's an evacuation. Do you to know where a public emergency shelter is located in your area?

1 Yes
2 No
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Yes	521	45.07
No	624	53.98
DON'T KNOW	11	0.95
REFUSED	0	0.00
Total	**1156**	**100.00**

Q04

Do you, or someone in your household, rely on vital daily prescription medications, such as insulin for diabetes, Plavix for blood thinning, or something like that?

1 Yes
2 No
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Yes	798	68.73
No	362	31.18
DON'T KNOW	1	0.09
REFUSED	0	0.00
Total	**1161**	**100.00**

Q05

Do you or someone in your household have a plan to keep an available supply of those medications if you had to leave home for several days or more because of a disaster?

1 Yes
2 No
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Yes	634	80.76
No	147	18.73
DON'T KNOW	4	.51
REFUSED	0	0.00
Total	**785**	**100.00**

Q06
In terms of personal resources, how prepared are you to take care of yourself if you had to leave your home for several days because of a disaster? Are you...

[ONLY IF NEEDED: By "personal resources" I mean things like transportation, money and access to medical care.]

1 not at all prepared, you don't have the resources to stay away from home
2 not very well prepared, you couldn't make it more than a day or two away from home
3 somewhat prepared, you could make it a few days away from home, but not much longer
4 well prepared, you could make it for a week or more away from home without major problems
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Not at all prepared	160	13.90
Not very well prepared	123	10.69
Somewhat prepared	313	27.19
Well prepared	545	47.35
DON'T KNOW	8	0.70
REFUSED	2	0.17
Total	**1151**	**100.00**

Q07
What if you had to *remain* in your own home for more than a few days during a disaster. In that situation, would you have the resources to take care of yourself at your home? Are you…
1 not at all prepared to stay at your home without any help
2 not very well prepared, you couldn't make it more than a day or two at home
3 somewhat prepared, you could make it a few days at home but not much longer
4 well prepared, you could make it for a week or more at home without major problems
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Not at all prepared	124	10.73
Not very well prepared	104	9.00
Somewhat prepared	364	31.49
Well prepared	553	47.84
DON'T KNOW	10	0.87
REFUSED	1	0.09
Total	**1156**	**100.00**

Q08
In the last several years, has there been a disaster like a hurricane, flood, or a chemical accident, that caused people living in, or near your neighborhood to have to evacuate the area?
1 Yes
2 No
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Yes	670	57.86
No	486	41.97
DON'T KNOW	2	0.17
REFUSED	0	0.00
Total	**1158**	**100.00**

Q09
Did you find out about the evacuation in time to be evacuated?
1 Yes
2 No
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Yes	566	86.15
No	69	10.50
DON'T KNOW	18	2.74
REFUSED	4	0.61
Total	**657**	**100.00**

Q09a_1
How did you learn that an evacuation was taking place?
Did you find out by: [choose *one* from this list; ROTATE]

1 TV
2 Radio
3 Family/friend/neighbor
4 Fire or police came to my door
5 Automated phone call
6 NOAA [pronounced "Noah"] weather band radio
7 Other [specify]
88 DON'T KNOW
99 REFUSED

Response	Frequency	Percent
TV	389	63.98
Radio	40	6.58
Family, friend, neighbor	76	12.50
Fire or police came to my door	19	3.13
Automated phone call	6	1.00
NOAA weather band radio	10	1.64
Other	68	11.18
Total	**608**	**100.00**

Q10
Did you or someone from your household evacuate your home?
1 Yes
2 No
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Yes	463	69.63
No	198	29.77
DON'T KNOW	2	0.30
REFUSED	2	0.30
Total	**665**	**100.00**

Q11
From the list I am about to read, what was the MOST IMPORTANT reason you or someone from your household decided to evacuate? [read - choose one] ROTATE
1 Advice from friends or family
2 Saw that neighbors were leaving
3 Felt it was too dangerous to stay home
4 Followed government evacuation warning
5 Other [specify]
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Advice from friends	45	9.83
Saw that neighbors were leaving	8	1.75
Felt it was too dangerous to stay home	213	46.50
Followed government evacuation warning	144	31.44
Other (specify)	47	10.26
DON'T KNOW	0	0.00
REFUSED	1	0.22
Total	**458**	**100.00**

Q12
From the list I am about to read, what was the MOST IMPORTANT reason you chose to stay home and not evacuate?

1 No transportation
2 Didn't have enough money to leave
3 Too difficult for me or another household member to travel
4 Didn't know where I would go
5 Felt safer at home
6 Didn't have enough information about the evacuation
7 Didn't think there was too much danger
8 Public shelter facilities cannot accommodate me or household member
9 Other [specify]
88 DON'T KNOW
99 REFUSED

Response	Frequency	Percent
No transportation	3	1.69
Didn't have enough money to leave	16	8.99
Too difficult for me or another household member to travel	6	3.37
Didn't know where I would go	3	1.68
Felt safer at home	30	16.85
Didn't have enough information about the evacuation		
Didn't think there was too much danger	8	4.50
Public shelter facilities cannot accommodate me or HH member	50	28.09
Other	4	2.25
DON'T KNOW	58	32.58
REFUSED		
Total	**178**	**100.00**

Q13
When you evacuated, where did you go? Was it to friends or family, a hotel/motel, public shelter, some other community shelter, or somewhere else?
1 friends/family
2 hotel or motel
3 public shelter
4 other community shelter, like a church facility
5 Other [specify]
8 DON'T KNOW
9 REFUSED

Response	**Frequency**	**Percent**
Friends/family	228	49.67
Hotel or motel	107	23.31
Public shelter	36	7.84
Other community shelter…church facility	16	3.49
Other [specify]	72	15.68
DON'T KNOW	0	0.00
REFUSED	0	0.00
Total	**459**	**100.00**

Q14
When you evacuated, did you have everything you needed in terms of key resources, such as access to medical care or safe shelter?
1 Yes
2 No
8 DON'T KNOW
9 REFUSED

Response	**Frequency**	**Percent**
Yes	388	84.5
No	70	15.25
DON'T KNOW	1	0.22
REFUSED	0	0.00
Total	**459**	**100.00**

Q15
Which of the following statements best describes your most recent evacuation experience:
1 it went very smoothly – no problems
2 it went OK – you had most things that were needed
3 it didn't go very well
4 you had major problems with lack of items and services
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
It went very smoothly – no problems	176	39.47
It went OK – you had most things that you needed	194	43.50
It didn't go very well	25	5.60
You had major problems with lack of items and services	51	11.43
DON'T KNOW	0	0.00
REFUSED	0	0.00
Total	**446**	**100.00**

Q16
What supports did you bring for yourself or another household member? Did you bring:
[Check all that apply]
1 a wheelchair
2 medical equipment (such as oxygen or syringes)
3 special foods because of dietary restrictions
4 a personal care attendant
5 a service Animal
6 Other_____
7 None
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
A wheelchair	105	28.85
Medical equipment (such as oxygen or syringes)	92	25.27
Special foods because of dietary restrictions	64	17.58
A personal attendant	73	20.05
A service animal	13	3.57
Other ____	37	10.16
None	110	30.22
Total	**494**	

Note. For Question 16, frequency numbers are divided by 364 which is the total number of participants responding to the question. In some cases survey participants choose more than one answer to the question, therefore, the total number for all items is 494 and the percentage is 135.7 %.

If you aggregate all supports per Question 16; this is the distribution:

Response	Frequency	Percent
0 support	110	29.95
1 support	167	45.88
2 supports	60	16.48
3 supports	18	4.95
4 supports	9	2.47
5 supports	1	0.27
Total	**364**	**100.00**

Q17
In the weeks following your return home, would you say you were better off, worse off, or about the same in terms of your health and physical well-being?
1 better off
2 about the same
3 worse off
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Better off	25	6.60
About the Same	262	69.13
Worse off	90	23.75
DON'T KNOW	2	0.53
REFUSED		
Total	**379**	**100.00**

Q18
If something like a flood or hurricane was about to occur,, which of the following is the MOST IMPORTANT source of information you would use to find out what was going to happen (select one):
1 Government announcement or warning
2 Family, friends, or neighbors
3 News organization
4 Some other organization, like the Red Cross
5 Other [specify]
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Government announcement or warning	253	21.94
Family, friends, or neighbors	160	13.88
News organization	569	49.35
Some other organization, like the Red Cross	60	5.20
Other	104	9.02
DON'T KNOW	7	0.61
REFUSED		
Total	**1153**	**100.00**

Next, I would like to ask you a few questions about your relationships with other people or organizations in your community.

Q19
I'm going to read you a statement. Please tell me if you strongly agree, agree, disagree, or strongly disagree with it:

During a crisis such as an illness or accident, I receive adequate help and support from family, friends or neighbors.
1 Strongly Agree
2 Agree
3 Disagree
4 Strongly Disagree
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Strongly Agree	521	46.27
Agree	474	42.10
Disagree	72	6.39
Strongly Disagree	44	3.91
DON'T KNOW	12	1.07
REFUSED	3	0.26
Total	**1126**	**100.00**

Q20
Some people belong to community groups or volunteer organizations. I would like to ask you if you do volunteer work for, or are a member of, any of the following types of groups: [read list – check any that apply]

1 a church or faith-based group
2 a community charitable services group
3 a local civic organization, for example, a rotary club
4 A local senior's center
5 A sports or other recreation group
6 Other [Specify]
7 None
8 DON'T KNOW
9 REFUSED

Response	**Frequency**	**Percent**
A church or faith-based group	434	38.75
A community charitable services group	150	13.39
A local civic organization, for example, a rotary club	100	8.93
A local seniors center	88	7.86
A sports or other recreation group	87	7.77
Other [Specify]	143	12.77
None	474	42.32
DON'T KNOW		
Total	**1120**	

Note. For Question 20, frequency numbers are divided by 1120 which is the total number of participants responding to the question. Respondents were able to indicate all categories for which they are a member or volunteer, so that percentages do not add to 100%.

Q21
When there was an emergency or disaster in your community in the past several years, did you get any help from any of the following types of organizations:

1 a church or faith-based group
2 a civic group, for example, a rotary club
3 fire or police departments
4 a state or federal government agency
5 a local health care organization
6 Other [Specify]
7 No help from any community groups
8 DON'T KNOW
9 REFUSED
10 There was no disaster in my community

Response	Frequency	Percent
A church or faith-based group	137	11.80
A civic group, for example, a rotary club	28	2.41
Fire or police departments	106	9.13
A state or federal government agency	222	19.12
A local health care organization	50	4.30
Other [Specify]	109	9.39
No help from any community groups	249	21.44
There was no disaster in my community	166	14.30
Other	72	6.20
DON'T KNOW	0	0.00
REFUSED	0	0.00
Total	**670**	

Note. For Question 21, frequency numbers are divided by 670 which is the total number of participants responding to the question. Respondents were able to select to as many categories as applied to them, so that the percentages total to more than 100%.

Q22:
Please tell me if you strongly disagree, disagree, agree, or strongly agree with this statement:
During the disaster, I received help and support from family, friends or neighbors.

1 Strongly Disagree
2 Disagree
3 Agree
4 Strongly Agree
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Strongly Agree	273	48.15
Agree	178	31.39
Disagree	52	9.17
Strongly Disagree	39	6.89
DON'T KNOW	20	3.53
REFUSED	5	0.88
Total	**567**	**100.00**

Q23
Do you or a member of your household have any specific care needs, such as a significant medical condition, decreased mobility, visual or hearing impairment, or emotional or cognitive limitations?

1 RESPONDENT
2 OTHER HOUSEHOLD MEMBER
3 BOTH
4 None
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Respondent	487	41.95
Other household member	188	16.19
Both	131	11.28
None	352	30.32
DON'T KNOW	2	0.17
REFUSED	1	0.09
Total	**1161**	**100.00**

Q24
Could you tell me what type of specific need it is? Is it: [select all that apply]

1 medical
2 mental health
3 cognitive or intellectual impairment (such as Alzheimer's)
4 decreased mobility
5 visual impairment
6 hearing impairment
7 other (specify)
8 DON'T KNOW
10 REFUSED

Response	Frequency	Percent
No disability	357	30.99
Medical	387	33.60
Mental health	232	20.14
Cognitive or intellectual impairment (such as Alzheimer's)	118	10.24
Decreased mobility	40	3.47
Visual impairment	17	1.47
Hearing impairment	1	0.09
Total	**1152**	**100.00**

Q25
I'd like to ask how much the need for care affects daily activities. Does that care need have a minimal, moderate, or significant effect on [your ability/your household member's ability] to perform daily activities?
1 minimal
2 moderate
3 significant
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Minimal	233	30.51
Moderate	229	29.97
Significant	296	38.74
DON'T KNOW	4	.52
REFUSED	2	.26
Total	**764**	**100.00**

Q26
Do you, or a member of your household, use a caregiver for assistance with daily activities such as feeding, clothing, bathing, and so forth?
1 Yes
2 No
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Yes	361	45.47
No	433	54.53
DON'T KNOW	0	0.00
REFUSED	0	0.00
Total	**794**	**100.00**

Q27
How often is that assistance provided?
1 around the clock
2 several times a day
3 once a day
4 several times a week
5 once a week
6 other [specify]
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Around the clock	106	29.20
Several times a day	90	24.80
Once a day	52	14.25
Several times a week	75	20.66
Once a week	7	1.93
Other (specify)	32	8.82
DON'T KNOW	1	0.28
REFUSED	0	0.00
Total	**363**	**100.00**

Q28
Do you or a member of your household, use any medical devices or service animals for assistance with daily living?
1 Yes
2 No
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Yes	482	42.06
No	662	57.80
DON'T KNOW	2	0.17
REFUSED		
Total	**1146**	**100.00**

Q29
Of the following, which assistance device or devices is used in your household? [Read List: walker or cane, wheel chair, oxygen tank, ventilator, hearing assistance, some other device, or a service animal?
1 walker or cane
2 wheel chair
3 oxygen tank
4 hearing device
5 ventilator
6 other device [specify]
7 service animal
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Walker or cane	225	19.38
Wheel chair	260	22.40
Oxygen tank	73	6.29
Hearing device	69	5.94
Ventilator	25	2.15
Other device (specify)	130	11.2
Service animal	20	1.72
Misc devices	9	0.78
Other device	89	7.67
DON'T KNOW	0	0.00
REFUSED	0	0.00
Total	**1161**	

Note. For Question 29, frequency numbers are divided by 1161 which is the total number of participants who responded to the question. In some cases survey participants choose more than one answer to the question, therefore, the frequency for choosing an assistive device or service animal is **900** and the percentage is **77.53** %.

[If the respondent answered NO to Q28, skip ahead to Q30]

Q30
Next, I'd like to ask about another topic. How likely do you think it is that a disaster, like a hurricane, flood, or wildfire, will affect your household in the next year?
1 Very likely
2 Somewhat Likely
3 Somewhat unlikely
4 Very unlikely
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Very likely	243	21.15
Somewhat likely	405	35.25
Somewhat unlikely	225	19.58
Very unlikely	238	20.71
DON'T KNOW	36	3.13
REFUSED	2	0.17
Total	**1149**	**100.00**

Q31
If you were told to evacuate because of a disaster, how likely do you think it is that you would be seriously harmed, physically or mentally, during the evacuation? [NOTE: Do we need to read the response scale: Would you say "very likely" "somewhat likely" "somewhat unlikely" or "very unlikely" at this point?]

1 Very likely
2 Somewhat likely
3 Somewhat unlikely
4 Very unlikely
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Very likely	137	11.87
Somewhat likely	264	22.88
Somewhat unlikely	335	29.03
Very unlikely	384	33.76
DON'T KNOW	28	2.43
REFUSED	6	0.52
Total	**1154**	**100.00**

Q32
If you had to shelter in your home for several days during a disaster, and there was loss of power during that time, how likely do you think it is that you would be seriously harmed?

1 Very likely
2 Somewhat likely
3 Somewhat unlikely
4 Very unlikely
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Very likely	178	15.37
Somewhat likely	257	22.19
Somewhat unlikely	306	26.42
Very unlikely	401	34.63
DON'T KNOW	13	1.12
REFUSED	3	0.26
Total	**1158**	**100.00**

Q33
Next, I'd like to ask you: In general, how much of the time do you trust government to do what's right? Would you say just about always, most of the time, only some of the time, or almost never?
1 Just about always
2 Most of the time
3 Only some of the time
4 Almost never
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Just about always	94	8.27
Most of the time	374	32.90
Only some of the time	456	40.10
Almost never	194	17.02
DON'T KNOW	17	1.50
REFUSED	2	0.18
Total	**1137**	**100.00**

Q34
In general, how much of the time do you trust service providers, such as nursing homes or home health agencies, to do what's right? Would you say just about always, most of the time, only some of the time, or almost never?
1 Just about always
2 Most of the time
3 Only some of the time
4 Almost never
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Very likely	141	12.50
Somewhat likely	432	38.30
Somewhat unlikely	390	34.57
Very unlikely	119	10.55
DON'T KNOW	40	3.55
REFUSED	6	0.53
Total	**1128**	**100.00**

Q35
How likely do you think it is that if a major disaster strikes your area of the country that a large number of people would lose their lives? [NOTE: Again, do we need to read the scale here?]

1 Very likely
2 Somewhat likely
3 Somewhat unlikely
4 Very unlikely
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Very likely	281	24.50
Somewhat likely	407	35.48
Somewhat unlikely	257	22.41
Very unlikely	164	14.30
DON'T KNOW	35	3.05
REFUSED	3	0.26
Total	**1147**	**100.00**

Q37
First, what is the highest level of education you have completed?

2 Less than 9th grade
3 9th to 12th grade, no diploma
4 High school graduate
5 Some college, no degree
6 Associate degree
7 Bachelor's degree (B.A., B.S., R.N.)
8 Graduate or professional degree (M.A., M.S., Ph.D., M.D.)
9 DON'T KNOW
10 REFUSED

Response	Frequency	Percent
Less than 9th grade	99	8.78
9th to 12th grade, no diploma	126	11.18
High school graduate	289	25.64
Some college, no degree	257	22.80
Associate degree	81	7.19
Bachelor's degree (B.A., B.S., R.N.)	138	12.24
Graduate or professional degree (M.A., M.S., Ph.D., M.D.)	134	11.89
DON'T KNOW	1	0.09
Less than 9th grade	2	0.18

Total	**1127**	**100.00**

Q38
Do you consider yourself to be Hispanic or Latino?
1 Yes
2 No
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Yes	93	8.93
No	945	90.78
DON'T KNOW	1	0.10
REFUSED	2	0.19
Total	**1041**	**100.00**

Q39
What race do you consider yourself to be?
1 White (Caucasian)
2 Black or African-American
3 Asian
4 American Indian or Alaska Native
5 Native Hawaiian or Other Pacific Islander
6 Multiracial
7 OTHER (specify)
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
White (Caucasian)	787	71.48
Black or African-American	199	18.07
Asian	12	1.09
American Indian or Alaska Native	14	1.27
Native Hawaiian or Other Pacific Islander	3	0.27
Multiracial	22	2.00
Other (specify)	53	4.81
DON'T KNOW	5	0.45
REFUSED	6	0.54
Total	**1101**	**100.00**

Q40
Are you currently . . .
1 Employed full-time
2 Employed part-time
3 Retired
4 a student
5 a homemaker
6 unemployed
7 DISABLED
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Employed full-time	202	18.07
Employed part-time	129	11.54
Retired	705	63.06
A student	0	0.00
A homemaker	31	2.77
Unemployed	24	2.15
Disabled	23	2.06
DON'T KNOW	1	0.09
REFUSED	3	0.27
Total	**1118**	**100.00**

Q41
Age in Years

Response	Frequency	Percent	
1 to 10 Years Old	21	1.92	
11 to 20 Years Old	11	1.01	
21 to 30 Years Old	59	5.40	
31 to 40 Years Old	88	8.05	
41 to 50 Years Old	128	11.71	
51 to 60 Years Old	319		29.19
61 to 70 Years Old	254	23.24	
71 to 80 Years Old	138	12.62	
81 to 90 Years Old	63	5.67	
91 to 100 Years Old	10	0.91	
101Years Old and Older	2	0.18	
Total	**1093**	**100.00**	

Q42
Including yourself, how many people live in your household? _____
How many household members are:

Response	Frequency	Percent
1	273	24.87
2	439	39.98
3	187	17.03
4	95	8.65
5	55	5.00
6	21	1.91
7	9	0.82
8	8	0.73
10	3	0.27
11	1	0.09
12	1	0.09
REFUSED	6	.55
Total	**1098**	**100.00**

42a. Children under 6 years of age_____?

42b. Adults aged 65 or older_____?

Response	Frequency	Percent
No adults aged 65 or older	519	52.06
Adults aged 65 or older	469	47.04
DON'T KNOW	1	0.10
REFUSED	8	0.80
Total	**997**	**100.00**

Q43
Do you have any pets?
1 Yes
2 No
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Yes	515	46.78
No	585	53.13
DON'T KNOW	0	0.00
REFUSED	1	0.09
Total	**1101**	**100.00**

Q44
How long have you lived in your current area?
1 Less than two years
2 Between two and five years
3 More than five years
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Less than two years	78	9.00
Between two and five years	126	14.53
More than five years	662	76.35
DON'T KNOW	0	0.00
REFUSED	1	0.12
Total	**867**	**100.00**

Q45
What is your marital status? Are you single – never married, married, divorced, widowed/widower, or living with a partner?
1 single – never married
2 married
3 divorced
4 living with a partner
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Single – never married	195	22.59
Married	409	47.39
Divorced	118	13.67
Widowed, widower	93	10.78
Living with a partner	42	4.87
DON'T KNOW	0	0.00
REFUSED	6	0.70
Total	**863**	**100.00**

Q46
Is your total annual household income less than $50,000, or is it $50,000 or more?
1 Less than $50,000
2 $50,000 or more
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Less than $50,000	637	65.67
$50,000 or more	283	29.17
DON'T KNOW	12	1.24
REFUSED	38	3.92
Total	**970**	**100.00**

Q47_a
I am going to mention a number of income categories. When I mention the category that describes your total annual household income in the last 12 months, please stop me.

1 Under 20 thousand
2 20 to 29 thousand
3 30 to 39 thousand
4 40 to 49 thousand
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
Under 20 thousand	420	63.83
20 to 29 thousand	99	15.05
30 to 39 thousand	72	10.94
40 to 49 thousand	46	6.99
DON'T KNOW	6	0.91
REFUSED	15	2.28
Total	**658**	**100.00**

Q47_b
I am going to mention a number of income categories. When I mention the category that describes your total annual household income in the last 12 months, please stop me.

1 50 to 59 thousand
2 60 to 69 thousand
3 70 to 79 thousand
4 80 to 89 thousand
5 90 to 100,000 thousand
6 100,001 to 125 thousand
7 125,001 thousand or more
8 DON'T KNOW
9 REFUSED

Response	Frequency	Percent
50 to 59 thousand	54	17.30
60 to 69 thousand	44	14.10
70 to 79 thousand	33	10.58
80 to 89 thousand	32	10.26
90 to 100,000 thousand	35	11.22
100,001 to 125 thousand	30	9.62
125,001 thousand or more	55	17.63
DON'T KNOW	6	1.92
REFUSED	23	7.37
Total	**312**	**100.00**

Q49
GENDER OF RESPONDENT

1 MALE
2 FEMALE

Response	Frequency	Percent
Female	664	59.7%
Male	449	40.3%
Total	**1113**	**100.00**

[Note: Following questions were asked only of deaf/hard of hearing survey respondents]

Q50
What is the **most** typical way you receive emergency notification information about crises or disasters in your area, including notice about whether you might have to evacuate because of a disaster?

Response	Frequency	Percent
TTY	8	11.11
Closed captioned TV	27	37.50
Email/text message	10	13.89
FM listening device	1	1.39
Contact from family/friends	20	27.78
Other	6	8.33
Total	**72**	**100.00**