



EVACUATION
DECISIONS,
HOUSING ISSUES,
AND SENSE OF
COMMUNITY



PLACE REPORT

The Sandy Child & Family Health Study

Recommended Citation

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For further information about the Sandy Child and Family Health Study you may visit the project website, at www.scafh.org or contact co-Principal Investigator David Abramson, PhD, MPH at david.abramson@nyu.edu.

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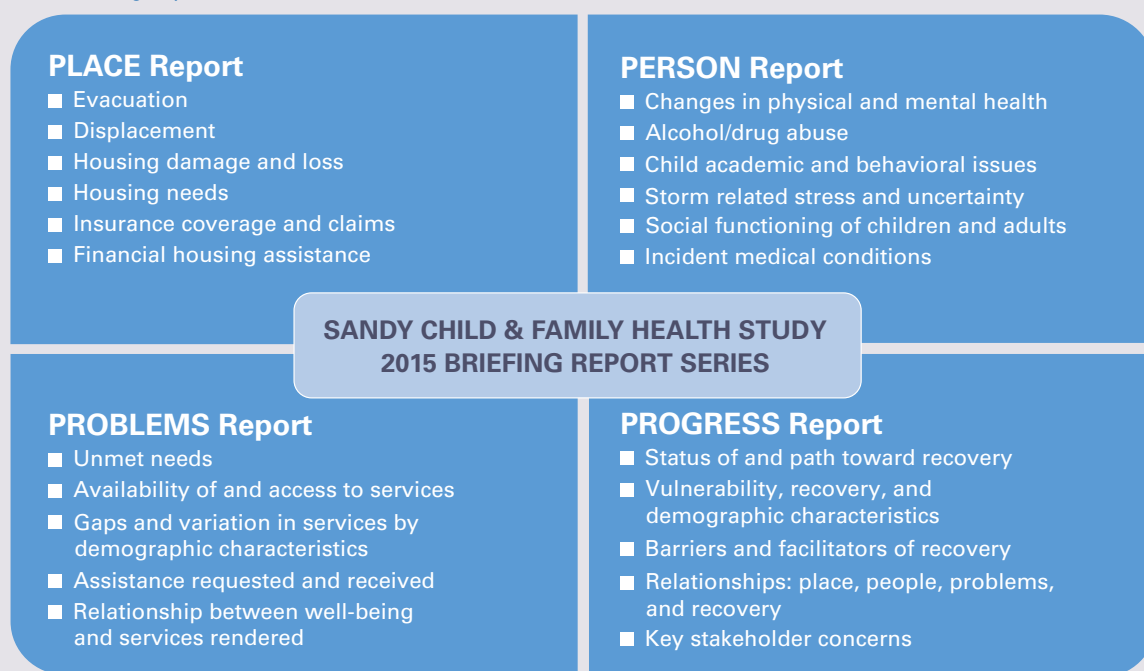
THE SANDY CHILD AND FAMILY HEALTH BRIEFING REPORT SERIES

This report is part of the 2015 Briefing Report Series of the Sandy Child and Family Health (S-CAFH) Study. Reports in the series describe the impact of Hurricane Sandy on several key aspects of New Jersey resident's lives. Four briefing reports will be provided by the team that cover the following topics: (1) **The Place Report** – the decisions and actions related to evacuation, housing, community, and restoration and repair; (2) **The Person Report** – the physical and mental health status and well-being of residents who lived in areas exposed to Hurricane Sandy, with an additional focus on children's health; (3) **The Problems Report** – residents' current unmet needs and their experience with systems of formal help; and (4) **The Progress Report** – the factors associated with stalled or facilitated recovery among affected residents.

Each report will follow a similar format, opening with a brief summary of the existing knowledge, a description of the study and the methods used to collect the data, key findings including figures and graphs that may assist readers in interpreting the data, a summary with policy and programmatic implications, and an appendix of detailed tables of the study results. Across all of these reports we employ a common approach for analyzing the data. We have constructed "presentation" categories so that we can represent the experiences of different groupings of New Jersey residents. We have categorized the residents in the S-CAFH Study by individual characteristics – such as age, gender, race/ethnicity – and by household-level characteristics – including the state region where they live, the amount of damage their home sustained, the presence or absence of children living in the household, and their annual household income. The series will conclude with a summary report detailing the main findings from the four substantive briefing documents. See Figure 1 for a summary of the core content in each of the briefing reports in the series.

Figure 1

The S-CAFH Briefing Report Series



EXECUTIVE SUMMARY

Hurricane Sandy was one of the largest storms on record, sweeping through the eastern seaboard of the United States with a massive diameter twice the size of Hurricane Katrina. Although wind speeds did not match those of Katrina, the combination of high tide at landfall and the lunar phase resulted in exceptionally high storm surges.

Catastrophic storms such as Hurricane Sandy can have devastating effects on many aspects of human life and the environment, undermining economic activity, crippling critical infrastructure, and disrupting hundreds of thousands of lives for weeks, months, or even years. The Sandy Child and Family Health (S-CAFH) Study was designed to describe and analyze the impacts of the storm on the residents of New Jersey, identifying those needs which emerged and those which are still pressing. The research team – a partnership of faculty and research staff from Rutgers University, New York University, Columbia University, and Colorado State University – randomly selected and surveyed 1,000 residents of New Jersey’s “Disaster Footprint,” representing the experiences of 1 million New Jersey residents living in or near those coastal areas of the state most directly exposed to the storm.

The primary focus of this Briefing Report, the first in a series of four thematic reports, is to document the storm’s impact on PLACE in New Jersey residents’ lives, with a particular emphasis on Sandy’s effect on people’s homes and housing decisions. Among the key findings of the report are the following:

- **Decision-making:** In the hours and days before the storm’s landfall, public officials made repeated efforts to persuade New Jersey residents living in vulnerable areas to evacuate. Approximately 24% of the residents living in the most highly-exposed areas of the nine affected counties, or about 240,000 people, were under a mandatory evacuation order. Over one-third of those residents complied with the mandatory evacuation order. South Jersey residents were twice as likely to evacuate as were North Jersey residents.¹ Those in the south were more likely to believe their home was unsafe in the face of the storm, more likely to have had prior hurricane experience, and more likely to have a place to go to.
 - **Implications:** More targeted risk communication and warning messages are needed. Public officials should consider testing and vetting messages using community engagement strategies, with a particular emphasis on “market segmentation” approaches and specific attention to messaging for vulnerable populations;
- **Destruction and Disruption:** Approximately 110,000 residents in the nine hardest-hit counties were living in homes that suffered major structural damage or were destroyed, and an additional 90,000 people were living in homes that sustained enough damage to make them uninhabitable for a short period of time. There were substantial corollary impacts even among those residents whose homes were characterized as structurally undamaged– 31% reported wind damage, 18% reported flood damage, and 11% reported mold damage. Eighty-eight percent of people lost power and between about half and three-quarters lost hot water and heat because of Sandy.
 - **Implications:** Long-term recovery metrics that measure the progress of repair and restoration of damaged housing are needed since this represents a central aspect of individual and community recovery. These recovery metrics should be able to distinguish progress within each category of FEMA-defined housing damage: destroyed, major, minor, affected, or none;

¹ North: Bergen, Essex, Hudson, Middlesex, Union Counties; South: Atlantic, Cape May, Monmouth, Ocean Counties.

EXECUTIVE SUMMARY (CONT'D)

- **Housing help needed and sought:** New Jersey residents' housing needs are complex and cumulative. Approximately one-quarter of residents living in the Disaster Footprint, about 240,000 individuals, needed practical assistance in clearing debris, repairing and restoring homes, and elevating their homes to protect them from future storms. Sixteen percent of New Jersey residents expressed a need for financial help in paying rent, mortgage, or utilities, about half of whom also had expressed a need for practical repair services. For housing-related needs such as debris clearing or replacing furnishings, between 40-50% of residents with a need applied for assistance; for elevating, restoring, or repairing a home, approximately 80% applied for assistance. Still, despite many residents applying for aid, only 25% of residents in the Disaster Footprint had heard of the state's Sandy Homeowner and Renter Assistance Program (SHRAP), a widely-available and accessible program that offered up to \$15,000 in financial assistance. Among those who had heard of SHRAP, only one in five had applied for assistance, although among those whose homes suffered major structural damage, nearly two-thirds applied for help.
 - **Implications:** Public officials should develop targeted communication strategies that are based on lists or registries of owners and renters of damaged housing. Housing damage is a risk factor for financial stress and for health-related stress as well (as described in the PERSON Briefing Report). Messages can focus upon available programs and services with clear eligibility criteria;
- **Vulnerability:** As with so many historic disasters, there was a sharp income gradient associated with both post-storm need and with help asked for and received. Those with the least amount of income reported the greatest housing needs, while those with the greatest household income were generally more likely to apply for assistance. This "poverty penalty" seemed reasonably consistent: in addition to starting out with less stability in their lives, in that those in the lowest income bracket were far less likely to be married or partnered, far less likely to have achieved higher or advanced educational degrees, and far less likely to be homeowners, this impoverished population was much more likely to spend all or most of their savings or credit on recovery needs.
 - **Implications:** Financial counseling services should be developed as part of disaster case management, in order to help storm victims identify and access all available assistance programs and manage their financial assets appropriately. In addition, officials should consider the development of micro-loan programs for storm-affected populations with limited financial means.

Any effort to facilitate good decision-making on the part of New Jersey residents, whether it involves evacuation decisions, restoration decisions, or financial decisions, should be predicated on timely and targeted messaging. This Briefing Report provides data on the decisions and actions that residents adopted in the face of the impending storm and throughout the recovery period. This information should help inform officials and stakeholders as they develop even more effective communication campaigns.

Assuring safe and stable housing is one of the most important individual and collective goals after a catastrophic disaster. Individuals and families rely upon homes for shelter, sanctuary, and often as a significant economic asset; in turn, communities rely upon a strong housing base as a means of maintaining or enhancing political strength and community resilience, as well as serving as linchpins for social and economic growth. While many residents in New Jersey's Disaster Footprint are making substantial progress in rebuilding their homes and communities, there are clearly still pockets of damage and disruption, even two and a half years after the storm.

background

Catastrophic storms such as Hurricane Sandy can have devastating effects on many aspects of human life and the environment: They can undermine economic activity, cripple critical infrastructure and supply lines, displace households and businesses for weeks, months, or even years, have lasting physical and mental health impacts on those who are exposed to such events, and even alter our relationship to the physical and social landscapes in which we live.

The Sandy Child and Family Health (S-CAFH) Study was designed to describe and analyze the impacts of the storm on the residents living in nine of the hardest-hit counties in New Jersey, identifying those needs which emerged and those which are still pressing. To accomplish this, a random sample of 1,000 residents living in or near those coastal areas of the state most directly exposed to the storm was drawn and surveyed. This group – a research “cohort” – is statistically representative of the 1 million New Jersey residents who were living in those geographic areas of the state most exposed to the storm, referred to throughout this study as Sandy’s Disaster Footprint (See Figure 3).

The primary focus of this Briefing Report, the first in a series of four thematic reports, is to document the storm’s impact on PLACE in New Jersey residents’ lives, with a particular emphasis on Sandy’s effect on people’s evacuation behavior, homes, and housing restoration decisions. Among the questions the PLACE Report seeks to answer are:

1. As the storm approached, what **decisions** did New Jersey residents make regarding evacuating or sheltering in place, and why?
2. After the storm passed, what was the magnitude of **destruction and disruption** in people’s lives?

3. What housing-related **help** was **needed** by New Jersey residents, and what help was **sought**?

4. How do issues related to PLACE, including housing and community, impact **vulnerable** populations and hinder recovery?

This Briefing Report follows the conventional structure of a research report. It begins with an introduction that describes the context for the S-CAFH study, follows with a brief description of the geographical area under investigation, presents some of the key research findings, and concludes with a consideration of the implications of the findings. For interested readers, there are a number of appendices at the back of this report, which present the study methods and data in greater detail.

The Storm and its Impacts

To understand the impact of Hurricane Sandy on the residents of New Jersey, one needs to begin with the storm itself, both in terms of its magnitude and its power. By the time the center of Hurricane Sandy² made landfall in the United States near Brigantine in Atlantic County, New Jersey, at 7:30 p.m. on October 29, 2012, the National Weather Service had been broadcasting dire warnings about the impending storm for days. Forecasters predicted record coastal flooding as early as October 25.

² When it made landfall in the U.S., Sandy was a post-tropical cyclone. The media adopted the non-scientific term “Superstorm.” Following the lead of other academic and government reports, we adopt the term “Hurricane Sandy” throughout the S-CAFH Briefing Reports series.

background

On the morning of Sunday, October 28, the National Weather Service warned of “*major coastal flooding... possibly to record levels*” and high winds of up to 70 miles per hour that would cause “*power outages [that] could last at least several days.*” Likewise, the National Hurricane Center warned of 6 to 11 feet of storm surge along the coasts of New Jersey and New York, using the urgent headline “*Life-Threatening Storm Surge.*”³ The region was on high alert that a catastrophic storm was bearing down on the Atlantic seaboard.

As with most such storms the principal threats were from wind and water. This was exacerbated in the case of Sandy, as the hurricane struck at a particularly dangerous time: Sandy’s landfall coincided with a high-tide cycle that was higher than normal due to a full moon. Meanwhile, the storm’s extremely low pressure enhanced wind speeds from the northeast, causing water to back up along the coasts, bays, and harbors along the eastern seaboard during multiple high-tide cycles. These two effects led to record-setting storm surge and wave action that battered the shores of Long Island in New York and northern New Jersey.⁴

The storm surge flooded the New Jersey coastline with water and sand up to 8 feet above ground level in some locations, with the worst flooding in Monmouth, Ocean, and Middlesex Counties. In these areas, homes were washed off their foundations, boardwalks

destroyed, and cars and boats carried inland by the raging water.⁵ Flooding did not just endanger coastal areas, it pushed water into New York Bay and up the Hudson and Raritan Rivers, causing massive flooding in Jersey City, Hoboken, and Sayreville.⁶ Many residents in these areas had to be rescued by the National Guard. As high winds and water inundated the area, the municipal water, sewage, electricity, and gas lines came under threat. By the time the storm was over, New Jersey faced roughly \$1 billion in damages to power and gas lines, \$3 billion in damages to waste, water, and sewer services, and nearly \$6 billion in housing damages.^{8,9} According to insurance claims and estimates of lost income, the financial impact of Sandy on New Jersey residents totaled \$7.8 billion, hitting low and moderate income households particularly hard.¹⁰

Hurricane Sandy’s northwest turn into the New Jersey coastline was a historically rare event: Since 1870, only one other hurricane entered the state without previously encountering land.¹¹ Sandy was also the second largest Atlantic storm on record, with tropical storm force winds reaching nearly 1,000 miles in diameter.¹² Its minimum pressure of 945 millibars is the lowest recorded pressure for a storm entering the United States north of Cape Hatteras, North Carolina. That low pressure is significant: While Sandy’s sustained wind speed of 80 mph is on the low end of a Category 1 hurricane, this low-pressure reading is more typical of a Category 3 Hurricane.¹³

³ National Oceanic and Atmospheric Administration (NOAA). 2013. “Service Assessment: Hurricane/Post-Tropical Cyclone Sandy, October 22-29, 2012.” National Weather Service, NOAA. Silver Spring, MD, U.S. Department of Commerce. <http://www.nws.noaa.gov/os/assessments/pdfs/Sandy13.pdf>. Accessed on March 23, 2015.

⁴ NOAA, 2013.

⁵ According to the National Weather Service, the tide gauge at Sandy Hook, NJ reported 8.01 feet above MHHW before it failed during the storm. The tide gauges in Bridgeport and New Haven, CT, reported water levels of 5.82 feet and 5.54 feet above MHHW. (NOAA, 2013).

⁶ Blake, E. S., T. B. Kimberlain, R. J. Berg, J. P. Cangialosi and J. L. Beven II. 2013. “Tropical Cyclone Report Hurricane Sandy (AL182012) 22-29 October 2012.” Miami, FL: National Hurricane Center. http://www.nhc.noaa.gov/data/tcr/AL182012_Sandy.pdf

⁷ Woolley, Wayne. 2013. “A Storm—and Response—Unlike any Other.” *Guardlife: The Official Magazine of the NJ National Guard* 35(4). Available at: <http://www.state.nj.us/military/publications/guardlife/volume35no4/5.html>

⁸ Blake, et al. 2013.

⁹ Rutgers School of Public Affairs. The Impact of Superstorm Sandy On New Jersey Towns and Households. 2013.

¹⁰ NJ Department Of Community Affairs. Community Block Grant Disaster Recovery Action Plan. 2013.

¹¹ FEMA. 2013. “Hurricane Sandy in New Jersey and New York: Building Performance Observations, Recommendations, and Technical Guidance Mitigation Assessment Team Report.” Washington, DC: FEMA.

¹² NOAA, 2013.

¹³ FEMA, 2013.

background

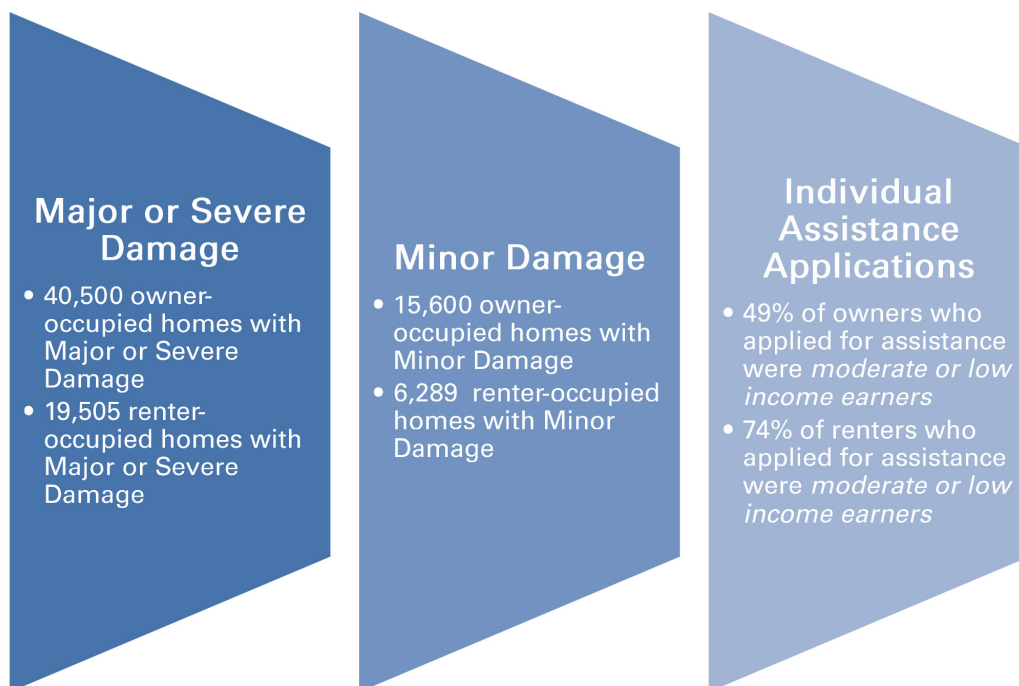
By 4:00 p.m. on Sunday, October 28, New Jersey Governor Christie had declared a state of emergency and issued a mandatory evacuation order for the following areas of the state: Atlantic City, Longport, Margate City, Brigantine, Ventnor City, Cape May City, Wildwood, North Wildwood, Wildwood Crest, Sea Isle City, Ocean City, Stone Harbor, Strathmere, Avalon, Lavallette, Mantoloking, Seaside Heights, Seaside Park, and all of Long Beach Island.¹⁴ That same day, Hoboken Mayor Dawn Zimmer and Jersey City Mayor

Jerramiah Healy ordered the evacuation of all basement and street-level residential units.^{15,16}

New Jersey is the most densely populated state in the U.S. The types of communities impacted by Sandy ranged from seaside towns of vacationers and pensioners along the Atlantic Ocean coastline to the economically-challenged rural towns on the shore of Delaware Bay, to the more populated urban and suburban cities of Hoboken, Jersey City, Newark, Moonachie, and Little Ferry.¹⁷ Such social, economic,

Figure 2

Housing Damage and Individual Assistance



¹⁴ New Jersey Executive Order 104. October 27, 2012.

¹⁵ FEMA, 2013.

¹⁶ There have been very few reported studies of evacuation compliance prior to S-CAFH. One survey of 500 residents of the New Jersey coast, conducted by the Monmouth University Polling Institute 5 months after the storm, suggests that compliance with the evacuation orders was limited. Among residents living in mandatory evacuation areas, only 49% reported evacuating prior to the storm while another 9% left once the storm was underway. Approximately 33% of coastal New Jersey residents evacuated during Sandy, a number comparable to evacuation during Hurricane Irene (30%). Monmouth University Polling Institute. 2013. "Superstorm Sandy Survey: Impact on New Jersey Coastal Residents." West Long Branch, NJ, Jersey Short Partnership Foundation and Urban Coast Institute, Monmouth University.

¹⁷ Hurricane Sandy Rebuilding Task Force. 2013. "Hurricane Sandy Rebuilding Strategy: Strong Communities, A Resilient Region."

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and geographic diversity meant that the types of damage and the needs of each population varied by location.

Most of the damage to residential housing resulted from flooding. Ocean-front buildings were also impacted by wave action and shore erosion. The majority of units damaged in coastal areas were older 1-2 family homes that were constructed prior to the community adoption of floodplain regulations and had generally not been elevated to the appropriate base flood elevation (BFE). Likewise, the majority of residential units in mid- and high-rise buildings damaged during the storm were not elevated to the recommended BFE. As a result, these buildings were flooded and suffered the failure of mechanical, electrical, plumbing, and other critical systems.¹⁸

FEMA was in the process of updating the floodplain maps, when Sandy hit. The project to revise the outdated maps had been underway for two years prior to Sandy. The new maps, which at the time of this report have not formally passed the federal regulatory process, are estimated to include an additional 33,000 New Jersey residences that were not in the previous FEMA 100-year floodplain map (roughly 267,000 residences are included in the updated map).¹⁹ If determined by a floodplain manager to be substantially damaged, these 33,000 homes will be required to be elevated in compliance with FEMA BFE program regulations, adding to the burden of housing recovery and repair costs.

The New Jersey Governor's office estimates that 40,500 owner-occupied and 15,600 renter-occupied homes sustained severe or major physical damage as a consequence of Sandy.²⁰ Another 19,505 owner-occupied and 6,289 rental units sustained minor damage. Housing damage has placed a significant burden not only on low income and poor New Jersey residents but also on moderate income residents. Roughly 49% of applicants for FEMA Individual Assistance program who reported major or severe damage to their homes—approximately 30,000 households—were low and moderate income earners. Meanwhile, 74% of renters who applied for assistance were low and moderate income households.²¹ Housing costs in New Jersey were already relatively high compared to other states prior to Sandy and was especially burdensome for low-income and moderate renters. According to HUD 2012 data, 42% of renters in New Jersey use at least one-third of their income to pay rent with many spending over half their earnings.²² The damage caused by Sandy led to a shortage of rental stock and increased rents, especially in the hardest hit communities, increasing the burden of housing costs for low and moderate-income residents.

The North/South Divide

Many residents and demographers characterize New Jersey as constituting two major regions, one north and one south, which are distinct geographically and culturally.²³ Although there is no clear boundary, residents often demarcate the split between North

¹⁸ FEMA, 2013.

¹⁹ New Jersey Department of Community Affairs. 2013. "Community Development Block Grant Disaster Recovery Action Plan." Trenton, NJ: State of New Jersey.

²⁰ HUD defines "severe" damage as homes FEMA determined to have greater than \$28,800 worth of physical damage or more than four feet of flooding on the first floor. Homes sustaining "major" damage have between \$8,000 and \$28,799 worth of physical damage or more than one foot of flooding on the first floor. Secondary residences, such as vacation homes, are not included in these statistics. (New Jersey Department of Community Affairs, 2013).

²¹ New Jersey Department of Community Affairs, 2013.

²² New Jersey Department of Community Affairs, 2013.

²³ Demographers and residents are divided as to whether there are two regions (north and south) or three regions (north, central, and south). We have adopted the two-region framework to simplify comparisons in this report.

background

Jersey and South Jersey as falling at about the point where the New Jersey Turnpike intersects the Garden State Parkway, somewhat parallel to the tip of Staten Island in Raritan Bay. The designation is a colloquial one, reflecting not only geographical but perceived cultural differences from the northern part of the state, with no official definition.

New Jersey is sandwiched between the two large cities of New York in the northeast and Philadelphia in the southwest; Benjamin Franklin called the state “a beer barrel tapped at both ends.”²⁴ Culturally, South Jersey is defined as the area in New Jersey within the influence of the Philadelphia metropolitan area (also known as the Delaware Valley), in contrast to the rest of New Jersey, located within the New York metropolitan area. In consultation with Rutgers University demographers, our research team divided the nine most affected counties into northern and southern regions. The north counties include Bergen, Essex, Hudson, Middlesex, and Union counties. The south counties include Atlantic, Cape May, Monmouth and Ocean counties.

As illustrated in the map in Appendix A, there are clear socio-demographic differences between North and South Jersey. The north is more racially and ethnically diverse, with a large Hispanic population, whereas the south is over 85% white. There is also an economic divide, in that many of the northern neighborhoods have concentrations of poverty and near-poverty, something reasonably rare in the southern portion of the disaster-affected counties.

The Social Consequences of Disasters on Place

Although many aspects of the built environment are damaged or destroyed when disaster strikes, the long-lasting and profound consequences stretch far beyond the loss of brick and mortar alone. Decades of social science research has examined how “place” impacts individuals and families.²⁵ When people are displaced, either temporarily or permanently, they experience a shock to their social systems. It may be weeks, months, or years before residents can return to their communities following disaster, and many never do. The psychiatrist Mindy Fullilove, in writing about displacement from urban housing, refers to this traumatic experience as “root shock,” similar to a plant being yanked from its native soil and transplanted. In the case of displaced populations, displacement can lead to a “reaction to the destruction of all or part of one’s emotional ecosystem.”²⁶ It is clear that survivors lose more than just their houses in a disaster; they lose their homes, neighborhoods, communities, and ultimately, for some, their place in the world.

For many adults and children, the loss of home and possessions has a deep impact on emotional well-being.²⁷ This, coupled with the stress of finding secure housing or repairing damaged homes, can increase their risk of negative psychological outcomes. Displaced homeowners often move into available apartments, pushing out renters and low-income homeowners.²⁸ Many low-income families search

²⁴ Fairall, Herbert (1885). *The World’s Industrial and Cotton Centennial Exposition, New Orleans, 1884-1885*. p. 225. Google Book Search. Retrieved on June 29, 2015. “Dr. Benjamin Franklin once shared the witticism ‘that New Jersey was like a beer barrel tapped at both ends, with all the live beer running into Philadelphia and New York.’”

²⁵ For a review of the literature, see Gieryn, Thomas F. 2000. “A Space for Place in Sociology” *Annual Review of Sociology* 26: 463-96.

²⁶ Fullilove, Mindy Thompson. 1996. “Psychiatric Implications of Displacement: Contributions from the Psychology of Place.” *The American Journal of Psychiatry* 153(12): 1516-1523.

²⁷ Nigg, Joanne M., John Barnshaw, and Manuel R. Torres. 2006. “Hurricane Katrina and the Flooding of New Orleans: Emergent Issues in Sheltering and Temporary Housing.” *Annals of the American Academy of Political and Social Science* 604: 113-128.

²⁸ Norris, Fran Norris, F. H., Friedman, M. J., Watson, P. J., Byrne, C. M., Diaz, E., Kaniasty, K. (2002). 60,000 Disaster Victims Speak: Part I. An empirical review of the empirical literature, 1981-2001. *Psychiatry*. 65(3). 207-239; Peek, Lori. “Age.” *Social Vulnerability to Disasters*, 2nd ed., edited by D. S. K. Thomas, B. D. Phillips, W. E. Lovekamp, and A. Fothergill, pp. 167-198. Boca Raton, FL: CRC Press.

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far and wide for places to live, some must leave their communities while others become homeless. Families and children often show great strength in the face of disaster, but over the long-term, the psychological burden of housing loss and instability can take its toll. Research shows an increase in domestic violence, post-traumatic stress disorders, and other mental health issues in communities heavily impacted by disasters.²⁹

Disaster research has also demonstrated that vulnerable social groups – low-income or poor residents, racial or ethnic minorities, women and children, persons with disabilities – are more likely to suffer from disasters and their aftermath.³⁰ Contributing to such vulnerabilities are the physical environment, housing characteristics, and community ties of these populations. Vulnerable populations are often more susceptible to the lasting impacts of a disaster due to damaged or displaced support networks, accessibility issues, or increased costs of living. Socially vulnerable groups tend to have networks made up of people with the same or similar social status, power, education, and income. Therefore, as already scarce resources are stripped away during a disaster, entire communities of people are left with little outside emotional and financial support that they can rely on to recover.³¹ In comparison, high-income individuals tend to have more diverse networks to draw upon in times of need.³² When a disaster strikes, they are more likely to have friends or family that live outside of the damaged areas, have more resources to draw

upon for assistance, and have stronger ties to people in positions of authority that can influence the disaster recovery process.

The reasons why some people are vulnerable and others are not have generated many theories and frameworks. Two of the most common regard social vulnerability as either the product of a lack of access to resources or capital, or the result of social structures and norms that reinforce vulnerability. Those individuals and households who cannot access different types of resources, whether financial, health-related, or social support, among other types of “capital,” are fundamentally vulnerable to a variety of stressors. This definition of social vulnerability acknowledges that many different factors may render different groups of people more at risk when disaster strikes, because they have the fewest resources available to prepare for, respond to, or recover from disaster. For instance, someone living in poverty may be vulnerable because he or she cannot obtain the money needed to appropriately prepare for a disaster and to evacuate in the face of potential harm. This vulnerability may be caused by not having sufficient money to pay for gas or a motel when considering evacuating, or not having enough financial assets to repair a home when insurance or other housing falls short. This framework also encompasses socially-isolated individuals, regardless of socio-economic status, such as some elderly residents in a community whose lack of access to social support resources make them vulnerable to a variety of housing harms.

²⁹ Norris, Fran Norris, F. H., Friedman, M. J., Watson, P. J., Byrne, C. M., Diaz, E., Kaniasty, K. (2002). 60,000 Disaster Victims Speak: Part I. An empirical review of the empirical literature, 1981-2001. *Psychiatry*. 65(3). 207-239; Peek, Lori. “Age.” *Social Vulnerability to Disasters*, 2nd ed., edited by D. S. K. Thomas, B. D. Phillips, W. E. Lovekamp, and A. Fothergill, pp. 167-198. Boca Raton, FL: CRC Press.

³⁰ For a review of the literature, see: Phillips, B., D. S. Thomas, A. Fothergill and L. Blinn-Pike (2010). *Social Vulnerability to Disasters*: 2nd edition. Boca Raton, FL: CRC Press; Fothergill, A. and L. A. Peek (2004). “Poverty and disasters in the United States: A review of recent sociological findings.” *Natural Hazards* 32(1): 89-110; and Fothergill, A., et al. (1999). “Race, ethnicity and disasters in the United States: A review of the literature.” *Disasters* 23(2): 156-173.; Bolin, Bob. 2006. “Race, Class, Ethnicity, and Disaster Vulnerability.” In *Handbook of Disaster Research* edited by H. Rodriguez, E.L. Quarantelli, and R.R. Dynes.

³¹ Norris, F. H., F. P. Stevens, F. Pfefferbaum, K. F. Wyche, and R. L. Pfefferbaum. 2008. “Community Resilience as a Metaphor, Theory, Set of Capacities, and Strategy for Community Readiness.” *American Journal of Community Psychology* 41: 127-150.

³² Lin, Nan. 2000. “Inequality in Social Capital.” *Contemporary Sociology* 29(6): 785-795.

cont'd

background

These individuals may have the fewest connections to help them navigate complex eligibility rules or they may not have access to others who can assist them in removing debris, for example.

Other researchers define vulnerability in “structural” terms. In this framework, social structures can shape one’s vulnerability. Discriminatory policies, norms, or cultural attitudes could lead to racial or ethnic minorities being more vulnerable. For example, housing assistance programs without bi-lingual staff could

disadvantage non-English speaking populations, who are unable to access assistance programs. Similarly, racial biases could lead claims adjusters to under-value property losses among racial minority residents.

For the purposes of this report and the others in the Briefing Report series, we examine whether residents’ race, gender, or economic class play a role in disaster recovery processes. Rather than subscribing to any particular theory of vulnerability we will let the weight of evidence speak for itself.

the disaster FOOTPRINT

The S-CAFH Study was designed to examine the impact of Hurricane Sandy on the geographical area denoted as the Disaster Footprint, presented in Figure 3. Approximately 1,047,000 people live within this geographical area, encompassing 411,000 households.

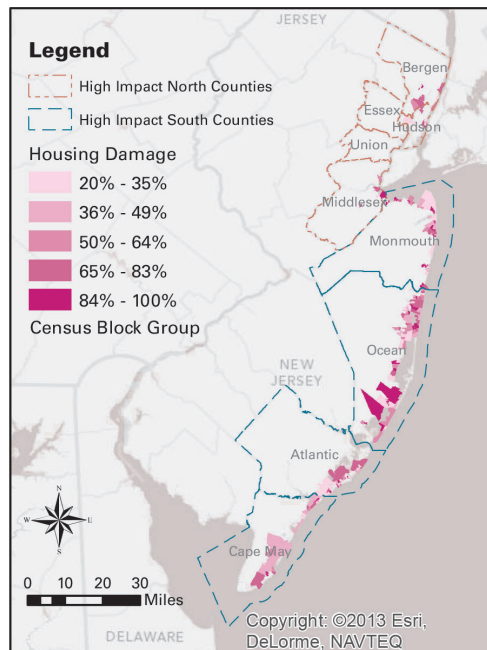
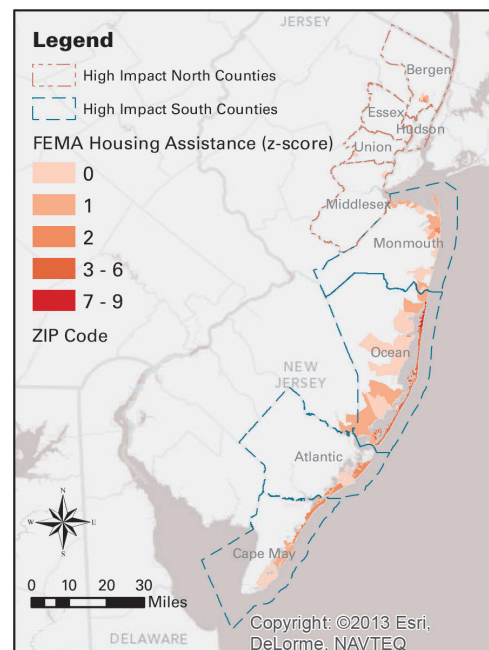
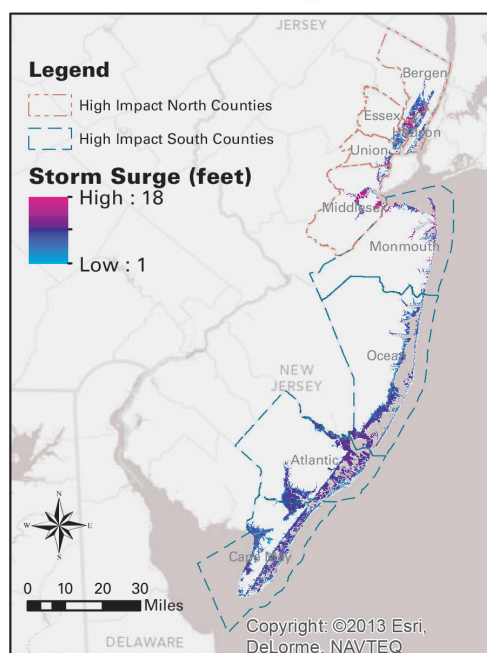
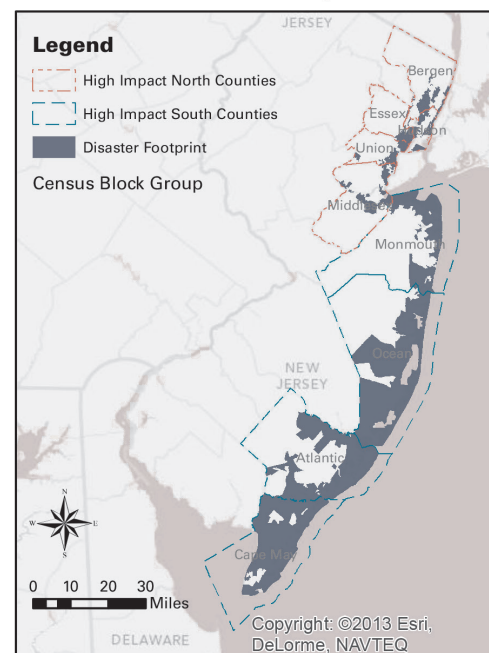
The Disaster Footprint was generated by our study team based on three criteria:

1. The nine counties in New Jersey rated as having had “Very High Impact” according to the FEMA Modeling Task Force (MOTF) Hurricane Sandy Impact Analysis were selected. These included Atlantic, Bergen, Cape May, Essex, Hudson, Middlesex, Monmouth, Ocean and Union counties in New Jersey.
2. Once these nine counties were selected, the sampling frame was further narrowed by three geographical layers:
 - a. Census block groups which experienced a storm surge of at least one foot, or
 - b. Census block groups in which at least 20% of all housing units sustained “Minor Damage,” “Major Damage,” or were “Destroyed,” as per FEMA assessments, or
 - c. ZIP codes which reported a greater than average number (z-score >0) of valid FEMA Housing Assistance registrations.
3. All three of the above geographical layers were overlaid so that any census block group that satisfied ANY of the three criteria was extracted and merged to create the final Disaster Footprint.

the disaster FOOTPRINT

Figure 3

Disaster Footprint

Housing Damage**FEMA Housing Assistance Claims****Storm Surge****Disaster Footprint**

methods

The S-CAFH Study recruited a random sample of New Jersey residents from those areas in the state that experienced: a) storm surges; b) flooding; and/or c) substantial property damages. Data was collected for the longitudinal cohort study between August 2014 and April 2015.

Respondents were sampled from census block groups taken from the nine most impacted counties in New Jersey exposed to Hurricane Sandy based on these criteria and further explained in Appendix A (Atlantic, Bergen, Cape May, Essex, Hudson, Middlesex, Monmouth, Ocean, and Union). Within the nine counties, 832 census block groups were categorized into eight sampling strata by region, damage, and poverty. These strata were developed so as to ensure the research team would have sufficient power of analysis among these sub-categories. From each of these strata, census block groups were randomly chosen resulting in the selection of 52 census block groups within the nine counties from the 832 total census block groups. Within each of these 52 selected census blocks, households were randomly selected for an interview.

Community-based interviewers conducted face-to-face surveys with adult members of the selected New Jersey households in the study. Once randomly

selected to be eligible for an interview, residents had to be the primary household resident at the time of the storm. A cohort summary can be found in Appendix C Table 1. The survey instrument for the first wave of data collection covered such topics as the decisions households made related to both evacuation and to recovery issues, their health and well-being, and the help they sought or received. In addition to learning about the adult or adults in the household, the team also asked specific questions about children living in the house, so as to learn of any long-term impacts of the storm on young people. Wave 2 of data collection will be conducted between April 2015 and June 2015 and cover additional thematic areas of recovery. After data collection, a weighting protocol was applied using sampling weights that (1) compensate for unequal probabilities of selection such as damage, (2) compensate for non-response³³, and (3) adjust for weighted sample distribution among key variables of interest.

³³ Non-response occurs when individuals chosen for a sample are unwilling or unable to participate in the survey.

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The findings reported in this PLACE Briefing Report are mainly drawn from data in the Appendix Tables, where readers can find additional information regarding our statistical analyses. The sections that follow align with the four questions introduced at the beginning of this Briefing Report:

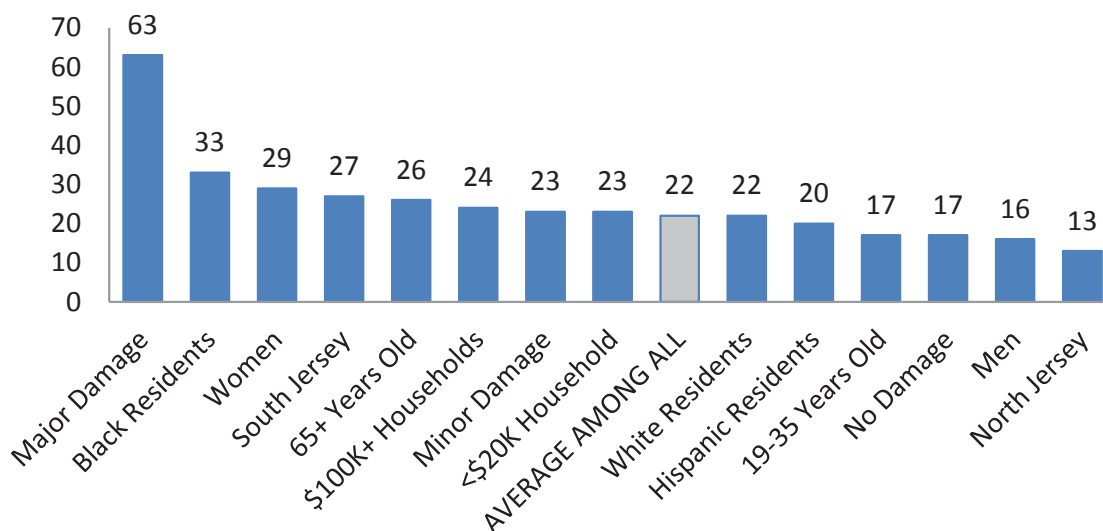
- **Decisions:** As the storm approached, what decisions did New Jersey residents make regarding evacuating or sheltering in place, and why?
- **Disruption and Destruction:** After the storm passed, what was the magnitude of destruction and disruption in people's lives?
- **Help Needed and Sought:** What housing-related help was needed by New Jersey residents, and what help was sought?
- **Vulnerability:** Were certain groups exposed to the storm more vulnerable to its effects or more adversely impacted?

Decisions

As Hurricane Sandy approached landfall the governor and local political leaders, as well as state and local emergency managers, ordered a number of New Jersey residents to evacuate their homes. Approximately 240,000 people in the Disaster Footprint were living in areas subject to these mandatory evacuation orders.³⁴ Twenty-eight percent of the residents in these mandatory evacuation zones left their homes before the storm (see Appendix C Tables 4 and 5); the other seventy-two percent of residents living in mandatory evacuation zones elected to stay in their homes during the storm.

Figure 4

Evacuation Rates by Demographic Characteristics (%)



³⁴ New Jersey Executive Order 104. October 27, 2012.

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Across the entire Disaster Footprint, covering those areas that were subject to mandatory evacuation orders and those areas that were not subject to mandatory evacuation, approximately 24% of residents evacuated their homes before Sandy struck.

Evacuation rates varied according to the characteristics of individuals and households. As illustrated in Figure 4, those residents who lived in the households that sustained the most damage – and which may have been at most risk before the storm struck – were also the most likely to evacuate: 63% of residents whose homes suffered major damage (see Appendix C for damage definitions) evacuated their homes before the storm. While such evacuation rates may be interpreted as high, nearly 40% – or 44,000 residents whose homes suffered major structural damage – remained in their homes during the storm.

Beyond damage, there were also differences in evacuation rates by different characteristics of residents, such as gender or region. For example, there were significant differences in evacuation rates by gender, in that 29% of women evacuated compared to 16% of men, and by region, in that 27% of residents in South Jersey evacuated compared to 13% of residents in North Jersey.

When viewing individual rates, as illustrated in Figure 4, it is difficult to interpret whether any particular characteristic is driving the finding. For example, is it the case that men are generally less likely to evacuate, regardless as to their income or where they live, or is that most of the men with whom we spoke live in North Jersey and that women from North Jersey would have answered similarly? In order to disentangle the influence of these characteristics on evacuation rates, we applied a logistic regression equation that considers all of these factors simultaneously. Table 1 describes the odds of residents evacuating before the storm when considering various socio-demographic characteristics. While such characteristics are often considered to be highly associated with evacuation decisions, this analysis demonstrates that only a handful were significant for residents in the Disaster Footprint, in this case region, gender, and race. Residents living in South Jersey [see Figure 4] were over 20 times as likely to evacuate compared to residents in the North. Hispanic residents were over twice as likely to evacuate as white residents while men were significantly less likely (0.54) to evacuate compared to women.

TABLE 1. ODDS OF EVACUATING BEFORE THE STORM, BY SOCIO-DEMOGRAPHIC CHARACTERISTICS

DEMOGRAPHIC FACTOR	ODDS RATIO
Living in South Jersey, compared to North Jersey	20.25
Black residents, compared to white residents	0.91
Men, compared to women	0.54
Age group 65+, compared to 36-64 year olds	1.73
Age group 19-35, compared to 36-64 year olds	0.64
Hispanic residents, compared to white residents	2.07
Households with children, compared to those without	1.05
Households with income less than \$20k per year, compared to \$21-99k/year	0.62
Households with income greater than \$100k per year, compared to \$21-99k/year	1.05

Note: Only the p-values of odds ratios < .05 represent statistically significant differences. Statistically significant variables are bolded.

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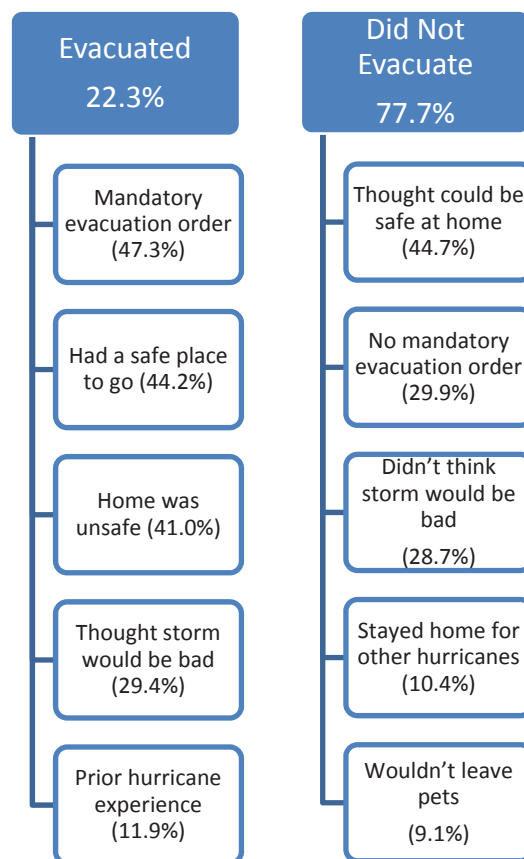
Interestingly, there were several factors that were **not** significantly associated with a greater likelihood of evacuating when holding all other factors constant: Residents living in mandatory evacuation zones were not more likely to evacuate than residents who were not placed under mandatory evacuation orders. In other words, residents evacuated at approximately the same rates, regardless as to whether they were subject to a mandatory evacuation order. Older residents were not more likely to evacuate than were younger residents; households with children were not more likely to evacuate than households without children;

and there were no significant differences in evacuation rates by income categories – neither those living in the wealthiest homes, those in middle-class homes, or those living in poverty were more or less likely to evacuate, all other demographic factors being equal.

The reasons **why** residents elected **to evacuate** their homes before the storm, or decided to shelter in their homes rather than leave, reveal a lot about the calculus of such evacuation decision-making. As illustrated in Appendix C Tables 4 and 5 and Figure 5, the primary reasons for evacuation decision-making were varied.

Figure 5

Reasons for Evacuation Decision-Making



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There are a number of factors underlying such decisions as to whether to stay or to leave in the face of a hurricane. Some people are more risk-averse than others, and adopt the conservative attitude that it is “better to be safe than sorry” whereas others are more tolerant of risk. There is also the matter of trust and confidence in scientific and political authorities – those with greater trust in such authority may be more inclined to comply with evacuation orders, whereas those with less trust may be less disposed to leave. It is noteworthy that very few residents listed such logistical reasons as homebound elderly or pets as reasons for not evacuating, reasons that historically are often listed by non-evacuating storm survivors in other parts of the country. What is perhaps most important to remember, however, is that evacuation decisions are complex, complicated, and informed by many cognitive, personal, social, and structural factors. As such, there is rarely one reason why people do or do not evacuate, but instead myriad components that ultimately influence the final decision.

It is also worthwhile to consider the consequences of such decisions. Approximately 110,000 residents in the Disaster Footprint experienced major structural

damage to their homes or their homes were destroyed. That would suggest that during the storm they were at much greater risk of injury or death because of the storm’s threat to their home. Nevertheless, approximately 44,000 of those residents did not evacuate their homes. This includes approximately 9,000 residents who were living in an area under a mandatory evacuation order at the time.

Disruption and Destruction

As noted in the introductory section above, Hurricane Sandy was a substantial storm that caused substantial flooding and wind damage in the exposed region. Yet, even within the boundaries of the Disaster Footprint there was considerable variation in the type and distribution of housing damage. Overall, about 11% of people in this geographical area – approximately 110,000 residents – were living in homes that sustained major structural damage or that were destroyed as a result of Sandy. This damage definition, drawn from the U.S. Department of Housing and Urban Development (HUD) guidelines (see Appendix C for definition), includes those homes that involved the total loss of the structure as well as whose floors,

TABLE 2. DAMAGE AND EXPOSURE

	NO DAMAGE OR AFFECTED	MINOR DAMAGE	MAJOR DAMAGE OR DESTROYED
Approximate population	800,000	90,000	110,000
Exposure and Concurrent Damages			
% with wind damage	31%	79%	53%
% with flood damage	18%	63%	85%
% with mold damage	11%	28%	45%
% who lost heat	77%	84%	96%
% who lost hot water	46%	81%	94%
% who lost a vehicle	7%	12%	28%
Displacement			
% displaced for 3 or more months	5%	7%	72%
Economic Burden			
% who spent all or quite a bit of their savings	6%	19%	54%
% who used all or quite a bit of their credit	3%	15%	21%

† Each of the rates reported in each cell in the table represents a proportion of all residents with a specific characteristic. They are each distinct, and as such all the rates will not add up to 100%.

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walls, or foundations were so damaged that it would require at least 30 days to repair, during which time the house was uninhabitable. An additional 9%, or 90,000 residents, were living in homes that experienced “minor damage,” which according to HUD guidance includes homes that were damaged and uninhabitable but which could be made habitable in a short period of time. The storm and recovery experiences of these nearly 200,000 residents is markedly different than those residents whose homes were undamaged or only slightly affected.

Table 2 illustrates some selected characteristics of storm-related damage and disruption to homes, property, and livelihoods based on the overall severity of damage. More detailed data tables regarding damage and destruction can be found in Appendix C Tables 2-3 and Appendix C Tables 6-7. It is noteworthy that even among homes without structural damage there was considerable exposure to the storm’s effects and significant disruption. A fair number of homes sustained wind, flood, or mold damage, and the homes also lost heat and hot water (approximately 88% of all homes lost electricity in the Disaster Footprint).

Flooding exposure is clearly associated with greater damage. Among the homes sustaining major structural damage, 84% experienced flood damage, almost a third as much more flooding damage than those homes that only experienced minor damage. Wind damage, on the other hand, was more likely associated with minor damage. Residents whose homes were catastrophically or substantially damaged were approximately twice as likely to lose a car as were those whose homes suffered minor damage, and nearly four times as likely as those whose homes were generally unaffected. Strikingly, a little over two-thirds of these residents were displaced from their homes for three months or more.

The financial implications of such variation in housing damage are also illustrated in Table 2 (as well as in Appendix C Tables 12-13 in greater detail). Whereas

one in twenty residents had to tap most of their savings or credit if their home was minimally affected, approximately one in four did for minor damage, and as many as one in two did if their home sustained major damage.

Help Needed and Sought

Since this report is focused on housing-related impacts of the storm, the examination of the types of help needed and sought are similarly related to housing restoration, repair, and reconstruction. Later Briefing Reports in this series will explore other types of help needed by people exposed to the storm, such as health or social service needs, as well as the unmet needs and service gaps still confronting New Jersey residents.

The data for this section are primarily drawn from Appendix C Tables 8 through 13. Discussion of housing costs sustained in a disaster often begin with questions of insurance coverage (see Appendix C Tables 8-9), since that is often the first resource accessed for repair and restoration. The adequacy of the residential insurance market has substantial implications for those public programs designed to be payers of last resort: If residents are appropriately insured, they will have less need to rely upon costly public housing assistance funds. Moreover, most homeowners with residential mortgages are required to have homeowner’s insurance, and those living in flood zones are often required to have flood insurance as well.

As illustrated in Figure 6, most homeowners in the Disaster Footprint do have homeowner’s insurance (98%), and among those homeowners whose homes sustained major damage, virtually all (91%) filed a claim against their coverage.

Flood insurance coverage (35%) and windstorm insurance coverage (18%) were much less common among homeowners in the study area. However, homeowners whose homes sustained major damage were more

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than twice as likely to have flood insurance as were the average homeowners in the Disaster Footprint, perhaps reflecting they were subject to mandatory flood insurance coverage or their awareness that they were at higher risk for flooding. Approximately thirty-five percent of renters had renter's insurance, and among those renters living in homes that sustained catastrophic damage, all made use of their insurance coverage. The Problems Report, a future Briefing Report on unmet needs and service gaps, will explore the adequacy of insurance coverage and other financial supports in greater detail.

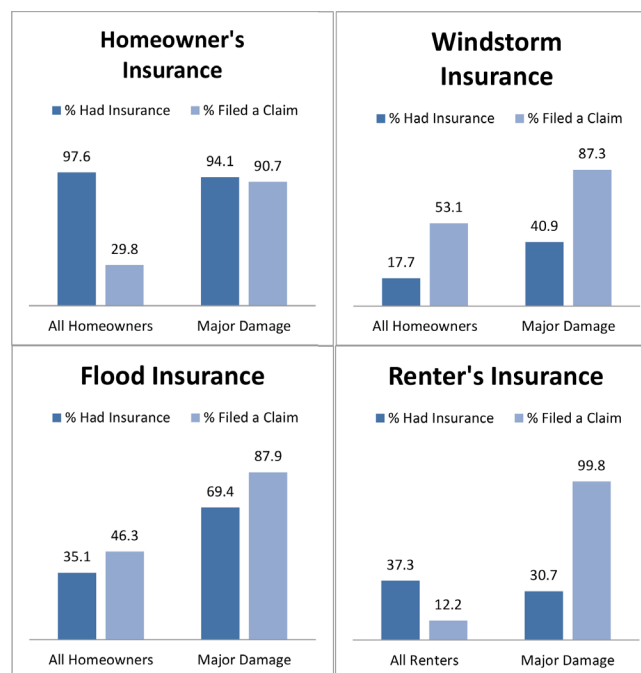
New Jersey residents exposed to Hurricane Sandy had a variety of housing assistance needs, as illustrated in Appendix C Tables 10-11. Across all residents, the greatest expressed housing needs were for:

- Debris removal (19%),
- Housing restoration help (16%), and
- Help paying utilities (12%).

Needs varied by location. Twice as many people in South Jersey needed help restoring or repairing their homes (19%) than did residents in North Jersey (10%). The types of assistance needed generally split along one of two lines: either instrumental help engaging in specific repair, mitigation, and clean-up tasks (such as elevating one's home or removing debris), or financial help associated with paying for mortgage, rent, or utilities.³⁵ Residents whose homes were significantly damaged were much more likely than other residents to need help with such instrumental assistance as restoration or repair (74%), debris removal (63%),

Figure 6

Comparison of Insurance Rates and Claims between All and those with Major Housing Damage



³⁵ It is possible that residents' expressed need for help in elevating their home is actually a financial need, although the wording of the question – "Did you or anyone in your household have a problem or need help with elevating your home?" – suggests more of an emphasis on the instrumental actions involved.

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furnishings for the home (39%), and house elevation (38%), and they were also much more likely to apply for assistance. Greater housing damage also translated into greater likelihood that residents would apply for assistance. Those who experienced major damage to their homes were 30% to 50% more likely to apply for assistance than were residents whose homes sustained minor damage.

There were a number of housing assistance programs implemented after the storm. Among the largest state-run programs were the Rehabilitation, Reconstruction, Elevation and Mitigation (RREM) state program totaling \$710 million, the Homeowner Resettlement program (\$215 million), and the Sandy Homeowner and Renter Assistance Program (SHRAP) with \$117 million.³⁶ The first of those two assistance programs were funded with federal Community Development Block Grant dollars, and SHRAP was funded through the Social Services Block Grant (SSBG) program. SHRAP provided financial assistance to New Jersey residents of up to \$15,000 to cover rent or mortgage costs, utility expenses, furnishings, and other essential items.³⁷ There were no income requirements or financial ceilings for SHRAP eligibility; the principal eligibility requirements were that the resident's cost was Sandy-related and that the SHRAP payment could not reflect a duplicate payment received through another assistance program or from private insurance. This report focuses only on the SSBG-funded SHRAP program, since it was managed by the Department of Human Services, a member of the Public Partnership Group

advising the study authors. Since no explicit questions were asked about other named housing assistance programs, such as RREM, we cannot directly compare the effectiveness or reach of all of these programs. Our analysis of one named program, SHRAP, illustrates residents' general awareness of the program and their use of that program.³⁸

As illustrated in Appendix C Tables 12-13, fewer than one in four residents had heard of SHRAP. Among those who had heard of SHRAP only 20% applied for assistance. Residents whose homes suffered major damage were over twice as likely to have heard of SHRAP (47%) as were those whose homes suffered minor damage (15%) or no damage (21%). Those whose homes experienced major damage were also far more likely to apply for SHRAP. Sixty-two percent of homeowners with major damage applied for SHRAP, compared to 33% of homeowners with minor damage, and 6% of homeowners with no damage.

Social Vulnerability and Place

This Briefing Report examines the experiences of three historically vulnerable groups: (1) those who are economically disadvantaged, (2) seniors, and (3) Black or Hispanic residents. The rationale for the vulnerability of individuals or households within these groups could be attributed to either the resource framework or the structural framework introduced in an earlier section. Clearly, not all individuals within each of these groupings are equivalent: A senior with a rich

³⁶ <http://www.nj.gov/humanservices/dfd/programs/shrap/>, accessed on April 1, 2015. According to one state official from the New Jersey Department of Human Services (DHS), SHRAP expended \$117 million over two years, making it the largest single Sandy assistance program in the DHS portfolio.

³⁷ Some housing assistance programs had very limited application windows. For example, the LMI Homeowners Rebuilding Program, designed to provide reconstruction, rehabilitation and elevation assistance to homeowners of low-to-moderate income (LMI) who were impacted by Superstorm Sandy and whose damaged primary residence is located in one of the nine most impacted counties, only accepted applications between January 5 through March 21, 2015.

³⁸ As a follow-up to our question about SHRAP we asked residents whether they had applied to other housing assistance programs. Given that it was possible that residents had in fact received SHRAP assistance without being aware of the program's formal name, we analyzed the open-ended responses to our question probing for the name of the other housing assistance programs. Of 401 residents who described other housing programs, 91 (22.7%) named RREM, 253 named FEMA housing subsidies (63.1%), 37 named the Homeowner Resettlement Program (9.2%). Virtually all residents were able to identify other housing assistance programs by name, lending confidence to our findings about SHRAP, and that it was correctly identified by most residents.

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network of friends and families and a comfortable retirement account is not the same as an isolated, homebound senior living from one Social Security check to the next. Future analyses, beyond the scope of this descriptive Briefing Report, can investigate such nuances. In this report, though, any differences found between these vulnerable groups and their “nonvulnerable” counterparts would suggest that there are significant and profound impacts associated with their particular vulnerability characteristic.

A number of studies have described income gradients that effectively lead to a “poverty penalty,” in which those individuals and households who are socio-economically disadvantaged or marginalized suffer significantly more harms, and are often more exposed to the hazard itself. For the purposes of providing a sharp contrast, this Briefing Report compares those individuals living in households earning less than \$20,000 annually with those individuals in households earning more than \$100,000 annually. Generally speaking, the New Jersey residents living in the Disaster Footprint who are in the poorer households are more likely to be younger, more likely to be Hispanic,

less likely to be married or partnered, have less formal education, and more likely to be renters than the wealthier residents (see Appendix C Table 1). Table 3, below, illustrates some of the other significant differences drawn from across the Appendix C Tables.

This table illustrates a selection of the starkest differences between the poorest and wealthiest residents, and suggests that access to resources and neighborhood context is clearly different depending on financial resources. There may be a cumulative effect, as well. Those who are poorer are likelier to have multiple needs – they are likely to have more complex housing needs, are less likely to have access to the resources available to address those needs (or feel comfortable or sufficiently knowledgeable to access the resources), and may live in chaotic neighborhood environments that amplify their housing needs.

Seniors over the age of 65 years old do not reveal the same depth of need or vulnerability as poorer residents. In fact, when examining certain aspects of recovery, it is often just the opposite, in that in certain circumstances seniors have better recovery

TABLE 3. INCOME DIFFERENCES IN HOUSING DAMAGE, NEEDS, AND SENSE OF COMMUNITY

	ANNUAL HOUSEHOLD INCOME ≤\$20,000	ANNUAL HOUSEHOLD INCOME ≥\$100,000
Housing damage and displacement		
% reporting mold damage in their home	40%	12%
% displaced for 3 or more months	29%	18%
Housing needs and services		
% needing help restoring their home	30%	12%
% needing help paying rent or mortgage	19%	3%
% needing help furnishing home	11%	4%
% needing help paying utilities	34%	3%
% having difficulties paying immediate housing costs	48%	5%
% spending all or most of their savings on recovery	28%	7%
% spending all or most of their credit on recovery	21%	3%
% of homeowners who heard of SHRAP	8%	24%
Residents’ sense of their community		
% with a strong emotional connection to their community	33%	47%
% who are frequently worried about disorder in their neighborhood	17%	10%

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outcomes. Seniors were the least likely to have had difficulty immediately following the storm in paying for housing costs, generators, and utilities. They also indicate a stronger sense of community and are less worried about their neighborhood than younger residents (Appendix C Table 15). Despite these, there are still notable aspects of recovery which are more difficult for seniors. Seniors are more likely to be displaced for three or more months due to the storm than younger residents (Appendix C Table 7) and statistically more likely to need help clearing debris and elevating their homes (Appendix C Table 11).

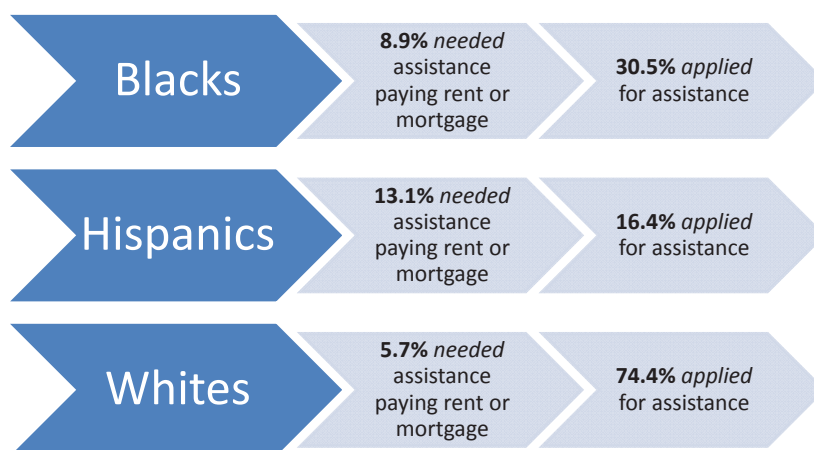
As with seniors, the differences among white, black, and Hispanic residents are less obvious than those between the poorest and wealthiest residents; but are most striking in examining those who accessed services. While white, black, and Hispanic residents were equally likely to express needing help to clean debris; paying for a rent or mortgage; and paying for furnishings; blacks and Hispanics were significantly less likely to apply for assistance (Appendix C Table 11). As illustrated in Figure 7, Blacks and Hispanics were approximately two or three times less likely to apply for assistance for paying rent or mortgage or furnishing their home, and significantly less likely to

apply for SHRAP despite hearing about the program at the same rates as white residents. In contrast, black and Hispanic residents were more likely to have spent all of their savings on recovery expenses in comparison to whites (Appendix C Table 13), perhaps reflecting the financial burden of paying for recovery on their own. Both black and Hispanic residents are less likely to report as strong a sense of community connection as are white residents, and both are more frequently worried about the physical disorder to their communities than are white residents.

In summary, there is a consistent case to be made for the presence of a “poverty penalty,” a mix of positive and negative contributing factors in the vulnerability of seniors, and a significant gap in applying for services impacting racial or ethnic minority populations. Resilience in seniors in the aftermath of Sandy in comparison to younger groups may be attributable to age, experience, and income. However, the vulnerability reported by minority populations calls for further exploration for a potential relationship with income, poverty, and other logistical barriers to service access—something that will be explored in the forthcoming Briefing Report on unmet needs.

Figure 7

Racial Differences in Application for Assistance



conclusion

This PLACE Report focuses on issues associated with residents' homes and housing. Assuring safe and stable housing is one of the most important individual and collective goals after a catastrophic disaster. Individuals and families rely upon homes for shelter, sanctuary, and often as a significant economic asset; in turn, communities rely upon a strong housing base as a means of maintaining or enhancing political strength and community resilience, as well as serving as linchpins for social and economic growth. While many residents in New Jersey's Disaster Footprint are making substantial progress in rebuilding their homes and communities, there are clearly still pockets of damage and disruption, even two and a half years after the storm. As storms approach, it is critically important that people be warned and move out harm's way – either based on their own resources or with the assistance of local agencies. This report helps the reader to understand who left and who did not prior to Hurricane Sandy, as well as the immediate term impacts of the storm in terms of housing damage and destruction.

Among the many findings and data points described in the report, four themes with policy and programmatic implications emerged:

- **Decision-making:** In the hours and days before the storm's landfall, public officials made repeated efforts to persuade New Jersey residents living in vulnerable areas to evacuate. Approximately 24% of the residents living in the most highly-exposed areas of the nine affected counties, or about 240,000 people, were under a mandatory evacuation order. Over one-third of those residents complied with the mandatory evacuation order. South Jersey residents were twice as likely to evacuate as were North Jersey residents.³⁹ Those

in the south were more likely to believe their home was unsafe in the face of the storm, more likely to have had prior hurricane experience, and more likely to have a place to go to.

Implications: More targeted risk communication and warning messages are needed. Public officials should consider testing and vetting messages using community engagement strategies, with a particular emphasis on "market segmentation" approaches and specific attention to messaging for vulnerable populations;

- **Destruction and Disruption:** Approximately 110,000 residents in the nine hardest-hit counties were living in homes that suffered major structural damage or were destroyed, and an additional 90,000 people were living in homes that sustained enough damage to make them uninhabitable for a short period of time. There were substantial corollary impacts even among those residents whose homes were characterized as structurally undamaged— 31% reported wind damage, 18% reported flood damage, and 11% reported mold damage.
 - Eighty-eight percent of people lost power and between about half and three-quarters lost hot water and heat because of Sandy.

Implications: Long-term recovery metrics that measure the progress of repair and restoration of damaged housing are needed since this represents a central aspect of individual and community recovery. These recovery metrics should be able to distinguish progress within each category of FEMA-defined housing damage: destroyed, major, minor, affected, or none;

³⁹ North: Bergen, Essex, Hudson, Middlesex, Union Counties; South: Atlantic, Cape May, Monmouth, Ocean Counties.emphasis on the instrumental actions involved.

conclusion

- **Housing help needed and sought:** New Jersey residents' housing needs are complex and cumulative. Approximately one-quarter of residents living in the Disaster Footprint, about 240,000 individuals, needed practical assistance in clearing debris, repairing and restoring homes, and elevating their homes to protect them from future storms. Sixteen percent of New Jersey residents expressed a need for financial help in paying rent, mortgage, or utilities, about half of whom also had expressed a need for practical repair services. For housing-related needs such as debris clearing or replacing furnishings, between 40-50% of residents with a need applied for assistance; for elevating, restoring, or repairing a home, approximately 80% applied for assistance. Still, despite many residents applying for aid, only 25% of residents in the Disaster Footprint had heard of the state's Sandy Homeowner and Renter Assistance Program (SHRAP), a widely-available and accessible program that offered up to \$15,000 in financial assistance. Among those who had heard of SHRAP, only one in five had applied for assistance, although among those whose homes suffered major structural damage, nearly two-thirds applied for help.
 - **Implications:** Public officials should develop targeted communication strategies that are based on lists or registries of owners and renters of damaged housing. Housing damage is a risk factor for financial stress and for health-related stress as well (as described in the PERSON Briefing Report). Messages can focus upon available programs and services with clear eligibility criteria;
- **Vulnerability:** As with so many historic disasters, there was a sharp income gradient associated with both post-storm need and with help asked for and received. Those with the least amount of income reported the greatest housing needs, while those with the greatest household income were generally more likely to apply for assistance. This "poverty penalty" seemed reasonably consistent: in addition to starting out with less stability in their lives, in that those in the lowest income bracket were far less likely to be married or partnered, far less likely to have achieved higher or advanced educational degrees, and far less likely to be homeowners, this impoverished population was much more likely to spend all or most of their savings or credit on recovery needs.
 - **Implications:** Financial counseling services should be developed as part of disaster case management, in order to help storm victims identify and access all available assistance programs and manage their financial assets appropriately. In addition, officials should consider the development of micro-loan programs for storm-affected populations with limited financial means.

APPENDIX A

STUDY DESCRIPTION

The strategic objectives for the S-CAFH study were two-fold: (1) to create a study sample of 1,000 households representative of residential areas within New Jersey exposed to Hurricane Sandy, and (2) to have sufficient numbers of cases within the sample for sub-group analyses that can be conducted of “high” damage versus “not high damage” areas, “northern” versus “southern” regions, and households with low income versus all other income levels. Addressing the first objective enables us to estimate population-level impacts and needs across the hardest-hit areas of the state. Addressing the second objective enables us to examine the extent to which New Jersey residents’ decisions, needs, health effects, and recovery may be explained by the damage they were exposed to, by regional differences, and by access to economic resources. To accomplish these objectives, we defined an area within New Jersey that was exposed to the storm (referred to as the “S-CAFH Disaster Footprint”), and developed a multi-stage stratified sampling design to yield sufficient numbers of cases for sub-group analyses. Sampling and post-stratification weights were developed and applied to the data once sampling and data collection were complete. The various elements of this approach are described in more detail in this appendix.

Disaster Footprint

The S-CAFH Study was designed to examine the impact of Hurricane Sandy on the Disaster Footprint presented in Appendix A Figure 3. Approximately 1,047,000 people—including about 411,000 households—live within this geographical area. The Disaster Footprint covers an area approximately 14% of the state, and that the population represents about 12% of the state. The disaster footprint was created based on three criteria:

1. The Hurricane Sandy Impact Analysis by the FEMA Modeling Task Force (MOTF) was used to identify the nine counties in New Jersey with a “Very High Impact” rating. The FEMA MOTF impact model is a composite of storm surge, wind, and precipitation. These very high impact counties had a population of over 10,000 persons exposed to storm surge in addition to more than 8 inches of precipitation during the storm and an estimate of over \$100M in wind-related damages. The counties that met these criteria included **Atlantic, Bergen, Cape May, Essex, Hudson, Middlesex, Monmouth, Ocean and Union**.
2. Once these nine counties were selected, the study team developed a sampling frame using a geographic information system (GIS) based procedure. Storm surge within the nine counties was identified using FEMA storm surge raster data based on satellite imagery and further filtered to include all areas with storm surge of greater than or equal to one foot. Housing damage data was acquired based on FEMA damage assessments. These data were available for the majority of housing lots in high impact zones. Lots which were classified by FEMA as minor (Full Verified Loss of \$5,000-\$17,000), major (Full Verified Loss of more than \$17,000), or destroyed (indicated by an Individual Assistance (IA) inspector) were aggregated at the census block group level. Block groups with at least 20% of all assessed units having one of the prior three classifications were then selected for inclusion in the study. FEMA Individual Assistance data were acquired at the ZIP code level. Valid registrations were summed and standardized (z-score) for the ZIP codes in the nine counties and those which summed to greater than the mean (a z-score of >0) were selected to be part of the footprint.

cont'd

APPENDIX A

STUDY DESCRIPTION

3. Finally, these three resultant geographic layers were superimposed upon one another and any census block group, which intersected any one of the three layers was selected to be included in the final Disaster Footprint.

In summary, the Disaster Footprint within the nine high impact counties is composed of:

- Census block groups which experienced a storm surge of at least one foot, or
- Census block groups in which at least 20% of all housing units sustained "Minor Damage," "Major Damage," or were "Destroyed," per FEMA assessments, or
- ZIP codes which reported a greater than average number (z-score >0) of valid FEMA Housing Assistance registrations.

Sampling

When conducting a household survey, researchers often use a random sample, which is a subset of individuals that have been randomly selected from the population. Sometimes, because researchers cannot ask survey questions of every member of the population—at least in heavily populated areas such as the one where we were working—a smaller subset of people is drawn at random that is intended to be representative of the larger population. We first determined the target number of New Jersey residents to be sampled by calculating the number necessary to have sufficient power in the sample, which would allow us to detect meaningful differences on key characteristics. In other words, there had to be enough people randomly sampled who could potentially exhibit a given characteristic to detect statistically significant differences between groups. Therefore, the research team determined that we needed a target sample size of 1,075 respondents.

APPENDIX A TABLE 1. CENSUS BLOCK GROUPS USED FOR SAMPLING IN THE DISASTER FOOTPRINT

	N	%
Geography		
North	262	32
South	570	68
Damage		
High (> 40% of households > minor)	79	10%
Low (affected)	393	47%
Unassessed	360	43%
Children		
High children (>35% of households have children)	305	37%
Low children(<35% of households have children)	527	63%
Poverty (#families)		
High poverty (>30% family below poverty)	249	30%
Low poverty (<30% family below poverty)	579	69%
N/A - Block groups with 0 families	4	<1%

cont'd

APPENDIX A

STUDY DESCRIPTION

One approach to selecting study respondents is to conduct a simple random sample, in which all the households within a given area of interest, in this case the Disaster Footprint, would be enumerated and then 1,075 of them, would be “picked out of a hat.” Although this selection strategy does provide the basis for estimating the characteristics of the entire population within the Disaster Footprint, it would not have guaranteed that there would be enough cases in the sub-groups of research interest – particularly those households that suffered varying degrees of damage or that were living in lower socio-economic neighborhoods. Thus, it also would not allow our team to make estimates that were reliably representative of these smaller populations.

An alternative approach, which our team ultimately employed, was to first group the “neighborhoods” (census block groups) into different strata, such as neighborhoods in the north, or neighborhoods that suffered considerable housing damage, or neighborhoods that were composed of households living at or below a poverty threshold. Once this grouping was completed, we could then randomly select households within these strata and make sure that there would be enough households to be representative. The table below shows the distribution of block groups by these characteristics of interest:

APPENDIX A TABLE 2. MATRIX OF CENSUS BLOCKS IN DISASTER FOOTPRINT BY STRATA

DISASTER FOOTPRINT								
Total # block groups		832						
Sampled # block groups		52						
GEOGRAPHY		North				South		
Total # block groups		262 (31%)				570 (69%)		
Sampled # block groups		18 (35%)				34 (65%)		
DAMAGE⁴⁰		High		Low		High		Low
Total # block groups		3		256		76		493
Sampled # block groups		3		15		24		10
POVERTY		High	Low	High	Low	High	Low	High
Total # block groups		1	2	99	157	16	60	133
Sampled # block groups		1	2	12	3	13	11	7
SAMPLED HOUSEHOLDS		50	100	300	75	325	275	175
COMPLETED HOUSEHOLDS		58	97	118	52	257	190	154

⁴⁰ When sufficient block groups are available, high damage and high poverty strata are sampled at approximately a 2:1 ratio

cont'd

APPENDIX A

STUDY DESCRIPTION

Respondents surveyed in the S-CAFH data were sampled from a total of 832 census block groups (262 in the North, 570 in the South) taken from nine New Jersey counties exposed to Hurricane Sandy (Atlantic, Bergen, Cape May, Essex, Hudson, Middlesex, Monmouth, Ocean, and Union). The 832 block groups were categorized into eight sampling strata by region, damage, and poverty. From each of these strata census block groups were randomly selected resulting in the selection of 52 census block groups within the nine counties from the 832 total census block groups (these block groups serve as primary sampling units [PSUs] from which a two-stage sampling plan was created^{41, 42}).

Within each of these 52 selected census blocks, households were randomly selected for survey interviewers, hired by Rutgers University and trained by the larger research collaborative, to visit their homes to attempt an interview. The sampling strategy employed by the S-CAFH team, including the stratifications can be found in the below Sampling Matrix. In this matrix, completion rates by strata are also exhibited.

Weighting

Even when random sampling has been used, it is important to compare the resulting survey data to population data, to see whether it is representative of the population. When the resulting data is different from the population level estimates, weights are often applied in order to allow researchers to generalize the results of that data to the population as a whole. Surveys often have imperfections due to various real-world conditions which can bias population-level estimates, so these sampling weights are also used to refine such imperfections within reasonable margins of error.

The S-CAFH weighting protocol used sampling weights that (1) compensate for unequal probabilities of selection such as damage (see above), (2) compensate for non-response, and (3) adjust for weighted sample distribution among key variables of interest. Specifically, base weights were calculated to map S-CAFH respondents to the total footprint population; subsequently, adjustments to the strata (geography, damage, and poverty) were made to reflect proportional distributions in relation to census block group characteristics. In addition, potential bias due to non-response was compensated by examining differences between target and sampled households in the strata; hard-to-reach housing units were adjusted by applying a correction for areas with high prevalence of vacant rental housing units. Adjustments were also made for gender, age, and households with children so that they reflect population distributions. Standard guidelines and techniques for constructing weights were applied in making these adjustments.^{43, 44} The overall 95% sampling error based on these adjustments is about 4%.

⁴¹ Lohr, S. L. (2010). *Sampling: Design and Analysis*. Boston, MA: Brooks Cole Publishing.

⁴² Yansaneh, I. (2005). Construction and use of sampling weights. In United Nations Department of Economic and Social Affairs, *Designing Household Survey Samples: Practical Guidelines* (pp. 119-140). New York, NY: United Nations Statistics Division.

⁴³ Valliant, R., Dever, J. A., & Kreuter, F. (2013). *Practical Tools for Designing and Weighting Survey Samples*. New York, NY: Springer.

⁴⁴ Moore, W., Pedlow, S., Krishnamurty, P., & Wolter, K. (2000). *National Longitudinal Survey of Youth 1997 (NLSY97)*. Chicago, IL: National Opinion Research Center (NORC).

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APPENDIX A

STUDY DESCRIPTION

APPENDIX A TABLE 3. COMPARISON OF UNADJUSTED AND ADJUSTED SURVEY DATA

	SURVEY DATA			
	UNADJUSTED		WEIGHTED	
	N	%	N	%
Household Characteristics	1000	100	1,047,286	100
Region				
North	325	32.5	314,186	30.0
South	675	67.5	733,100	70.0
Damage				
Major/Destroyed	298	29.8	115,201	11.0
Minor	156	15.6	84,256	9.0
None/Affected	543	54.3	836,782	79.9
Missing/Don't Know/Refused	3	0.3	1,047	0.01
Income				
<20K	104	10.4	84,831	8.1
20K-50K	224	22.4	191,653	18.3
51-99K	352	35.2	384,354	36.7
100K+	203	20.3	250,301	23.9
Missing/Don't Know/Refused	117	11.7	136,147	13.0
Children Present in Home				
Yes	300	30.0	382,259	36.5
No	700	70.0	665,027	63.5
Individual Characteristics	1000	100	1,047,286	100
Gender				
Male	419	41.9	488,035	46.6
Female	577	57.7	551,920	52.7
Missing/Don't Know/Refused	4	0.4	7,331	0.7
Age				
18-35	111	11.1	251,349	24.0
36-64	563	56.3	583,338	55.7
65+	326	32.6	211,552	20.3
Race				
Non-Hispanic White	758	75.8	745,668	71.2
Non-Hispanic Black	67	6.7	105,776	10.1
Hispanic	118	11.8	138,242	13.2
Asian Pacific Islander	26	2.6	209,457	2.0
Other	31	3.1	36,655	3.5

cont'd

APPENDIX A

STUDY DESCRIPTION

Field Effort

S-CAFH Field Team members conducted face-to-face and phone surveys with residents living in the Disaster Footprint between August 2014 and April 2015. Interviewers were rigorously trained over the course of five days on field protocols and on how to utilize mobile technology to conduct the survey. Team members were assigned to work certain census block groups and led by one of three team captains who were primarily responsible for managing the field effort.

The field team started working each census block group with a list of ordered addresses per block group. To be eligible to participate in S-CAFH, sampled respondents had to be the primary resident of the household at the time of the storm. The field team attempted to survey the first 25-50 addresses on that list. Any given visit to a household could result in a variety of outcomes that the team member documented through a status code for the rest of the staff. These status codes included the following:

1. Complete: Respondent has completed the entire interview.
2. Incomplete: Respondent has completed portions of the interview but not the entire interview.
3. Not Available: Respondent answers the door but does not have time to complete the interview. Interviewer should attempt to schedule future appointment with respondent to complete the interview.
4. Soft Refusal: Respondent answers the door but has low interest in completing the survey. Interviewers should attempt to persuade respondent and flip the case.
5. Hard Refusal: Respondent answers the door and it is clear that he or she does not have any interest in participating in the study.
6. No Answer: Respondent does not answer the door.
7. Ineligible (needs follow-up from captain): Respondent was not primary resident at the time of Hurricane Sandy. No contact information is given so interviewer should return the case to the team captain for tracking and tracing.
8. Ineligible (has contact information): Respondent was not primary resident at the time of Hurricane Sandy. Interviewer is able to obtain contact information on primary resident/owner at the time of Sandy.
9. Bad Address: Address given to interviewer does not exist. Please note that this is different from finding a vacant home/lot.
10. Vacant (needs follow-up): Interviewer arrives at sampled address to find a slab or uninhabitable/vacant home. This case should be returned to the team captain for tracking and tracing.
11. No access: Interviewer arrives at sampled address to find a gated area or other barrier to physically obtaining entrance to the property. This case should be returned to the team captain for tracking and tracing.

cont'd

APPENDIX A

STUDY DESCRIPTION

APPENDIX A TABLE 4A. FIELD EFFORT SUMMARY INCLUDING COOPERATION RATE AND RESPONSE RATE

	STATUS	CALCULATION	#
A	Completed Interviews		1000
B	Eligible, no interview	[C + D + E + F + H + I + J]	3692
C	Refusal / break-off		1141
D	No contact made because no access to sampled unit		84
E	No contact made because no one reached at sampled unit		2251
F	No contact made because R away or unavailable (but elig R exists)		216
G			
H	Physically or mentally unable		**
I	Language problem		**
J	Other reason (ex: incarcerated)		0
K	Unknown eligibility, no interview	[L + M + N + O]	524
L	Not attempted		**
M	Not safe		**
N	Cannot locate housing unit		230
O	Unknown whether there is an eligible respondent present		294
P	Not eligible	[Q + R + S + T + U]	1753
Q	Not in sample / sampled in error		92
R	Not a housing unit (including vacation rentals)		87
S	Vacant / abandoned		872
T	Quota has been filled (ex: replacements not used)		261
U	No eligible respondent in unit meets criteria		441
	Response Rate	$A / [A + B + K]$ RR2*	19.2%
	Cooperation Rate	$A / [A + C]$ COOP2*	46.7%
	Refusal Rate	$C / [A + B + K]$ REF1*	21.9%

*In accordance with "Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys, Revised 2011," American Association of Public Opinion Research.

**No status codes exist for these categories, as data was collected under prior AAPOR standard.

***Completes by visit:

cont'd

APPENDIX A

STUDY DESCRIPTION

APPENDIX A TABLE 4B. COMPLETED INTERVIEWS BY UNIQUE ATTEMPT

VISIT #	# OF COMPLETES IN THIS VISIT	PROPORTION COMPLETED
1	220	22.0
2	275	27.5
3	211	21.1
4	177	17.7
5	117	11.7
Total	1000	100.0

Total # of visits, including non-completes: 17,020

Appendix A Table 4A describes the field team's efforts in working cases to completion. Specifically, the final response rate was 19.2%, the cooperation rate was 46.4%, and the refusal rate was 22.2%. The response rate is the proportion of all eligible individuals who agreed to participate, whether or not we were able to find them and recruit them. The cooperation rate is the proportion of individuals who agreed to participate from among those individuals with whom we spoke. The field team made repeated visits to each sampled household, returning as many as five times and alternating the days of the week and time of day. As illustrated in Appendix A Table 4B, this persistence resulted in case completions: 30% of all cases were completed at either the fourth or fifth visit.

Description of the S-CAFH Cohort

The participants in the Sandy Child and Family Health Study are representative of the 1,047,000 New Jersey residents living in the Disaster Footprint. We have assembled the cohort – principally through the sampling and weighting described above – so that the experiences, attitudes, and characteristics of the 1,000-member cohort reflect those of the actual population in this hurricane-affected area of New Jersey. This design also allows us to cross-tabulate the characteristics of people living in the Disaster Footprint so that we can estimate the size of different sub-groups, such as the rate of homeownership among people who reside in the southern part of the footprint. Appendix C Table 1 describes the composition of the cohort, as it has been weighted, in some detail. This table has been formatted so that the columns represent household-level characteristics – such as whether the household is in the North Jersey portion of the Disaster Footprint or the South Jersey, how much damage the home sustained in the storm, whether there are children living in the house, and household income – and the rows represent selected individual-level characteristics of the residents – their gender, age, race/ethnicity, marital status, education, and homeownership status.

Approximately one-third of the population of this hurricane-affected area is in the north and two-thirds in the south. A little over a third of all residents are living in homes with minor children present. Approximately 10% of residents live in households earning less than \$20,000 per year.

According to population data, and as illustrated in the maps in Appendix A Figure 1, there are some widespread differences between North and South Jersey. The three southern counties, Ocean, Cape May and Atlantic

cont'd

APPENDIX A

STUDY DESCRIPTION

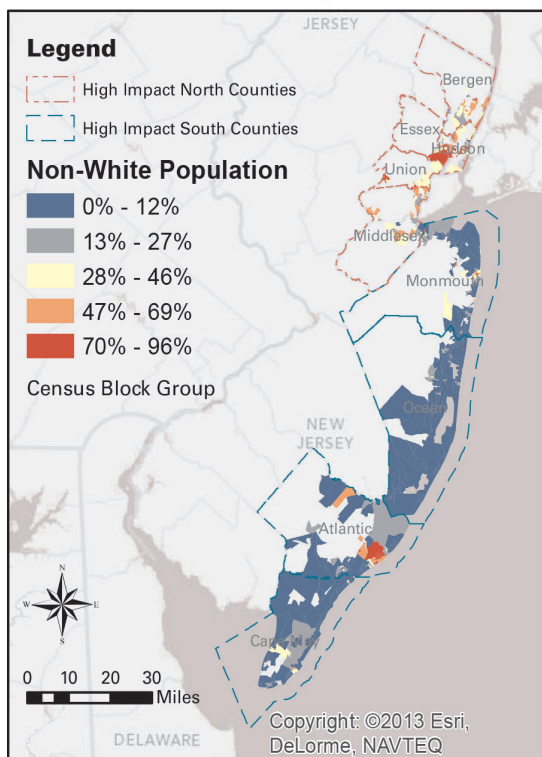
County, are overwhelmingly white, with most neighborhoods between 70% and 96% white. The six northern counties, Bergen, Essex, Hudson, Union, Monmouth, and Middlesex, are considerably more diverse. A similar economic divide can be seen in the map displaying the proportion of residents who are “Poor or Struggling”⁴⁵ in which there are greater numbers of pockets of poverty up north than in the south.

Demographics

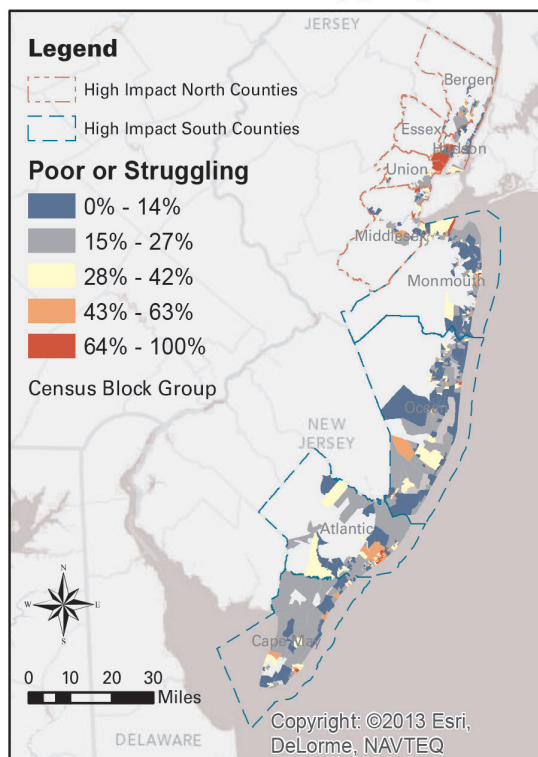
Appendix A Figure 1

Demographics

Non-White Population



Poor or Struggling



⁴⁵ A designation of “Poor or Struggling” is based on the ratio of income to poverty level, using data from the US Census’s American Community Survey, as supplied by Social Explorer. A ratio of under 1.0 indicates a population who is doing poorly, 1.00-1.99 indicates a population who is struggling, under 2.0 is poor or struggling and over 2.0 is doing moderately better. The values depicted in the map indicate the percentage of the census block group population who is doing poorly or struggling (population with a ratio of less than two divided by the total population in the census block).

cont'd

APPENDIX A

STUDY DESCRIPTION

A more detailed portrait of the cohort, as illustrated in Appendix C Table 1, also reveals differences in the types of individuals who comprise the households when they are categorized by north or south, by housing damage, by children living in the home, or by income:

- Women are more likely to be represented in homes with children, and in lower-income homes;
- The population in the south is older, with proportionately twice as many seniors over 65 than in the north;
- In the south there are proportionately more homeowners, more highly educated residents, and more people who report that they are married or partnered; and
- White and black residents are over-represented in the wealthiest income brackets, whereas Hispanic residents are over-represented in the lowest income brackets.

APPENDIX B

HOW TO INTERPRET STATISTICAL TABLES

Data tables like the ones presented in Appendix C can sometimes be difficult to interpret. To help the reader interpret the data tables presented here, we have included this guide. The boxes on this page each correspond to an explanation on the next page.

ROW HEADINGS		COLUMN PERCENTAGES							TABLE TITLE		COLUMN HEADINGS		
TABLE 3. HOUSING DAMAGE BY INDIVIDUAL CHARACTERISTICS (COLUMN %)													
		ALL	GENDER		AGE				RACE / ETHNICITY				
			MALE	FEMALE	19-35	36-49	50-65	66+	NON-HISPANIC WHITE	NON- HISPANIC BLACK	HISPANIC	ASIAN/ PACIFIC ISLANDER	OTHER¹
FEMA Damage Level²													
	No Damage	24.0	26.2	22.3	22.6	21.4	23.6	26.9	23.5	30.2	26.3	21.1	22.7
	Minor/Affected	49.8	50.8	49.3	50.0	55.7	50.0	45.1	48.8	51.2	49.1	63.2	54.6
	Major/Destroyed	26.2	23.0	28.5	27.4	22.9	26.4	28.0	27.8	18.6	24.6	15.8	22.7
Type of Damage													
	Wind	46.1	41.8	48.1	45.2	51.9	46.3	39.6	46.1	37.2	47.4	26.3	54.6
	Flood	64.5	63.5	65.2	61.3	61.8	66.2	65.0	64.8	53.5	63.2	84.2	59.1
	Mold	32.0	30.7	32.7	37.1	35.9	30.6	28.8	30.0	39.5	35.1	47.4	36.4
Loss of Utility³													
	Heat	84.3	82.4	85.3	83.9	85.5	86.6	80.2	84.3	83.7	86.0	94.7	72.7
	Hot Water	73.0	71.7	73.7	74.2	68.7	77.8	69.5	73.0	72.1	75.4	94.7	54.6
	Electricity	90.6	90.6	90.5	93.6	93.9	88.9	88.7	90.5	90.7	91.2	100.0	81.8

Margins of error for all cells are +/- 5 percentage points. P-values are indicated in the left corner cell of a given section as the following: * ≤ 0.05 ** ≤ 0.01 *** ≤ 0.001

MARGIN OF ERROR

STATISTICAL SIGNIFICANCE

Footnotes to Table 3:

¹ Other includes Native American and Multiracial.

² These categories reflect federal definitions of damage: Destroyed - total loss of structure, structure is not economically feasible to repair, or complete failure to major structural components; Major Damage - substantial failure to structural elements of residence (e.g., walls, floors, foundation), or damage that will take more than 30 days to repair and the home could not be lived in during this time; Minor Damage - home is damaged and uninhabitable, but may be made habitable in a short period of time with repairs; or Affected - some damage to the structure and contents, but still habitable.

³ Respondents were asked

APPENDIX B

HOW TO INTERPRET STATISTICAL TABLES

Elements of Data Tables

- **Table Title:** Each table in this and subsequent reports includes a title that provides a brief description of the content of the table. In the sample table above, you can see that we are describing “Housing Damage” (Left Column) by “Individual Characteristics” (Top Row), and that the numbers in the columns should be read as percentages “column %.”
- **Row Headings:** The left column of the table lists category names in bold followed by the survey options for each category. In the table above, the “Row Headings” arrow is pointing to “Type of Damage.” Under this category in the survey, respondents are able to choose “Wind,” “Flood,” or “Mold” to describe the type of damage they experienced.
- **Column Headings:** The top row of the table lists category names in bold. Under these headings, you will see split columns that include divisions within that variable. In the table above, the “Column Headings” arrow is pointing to “Race/Ethnicity.” This variable is then further divided into “Non-Hispanic White,” “Non-Hispanic Black,” “Hispanic,” “Asian/Pacific Islander,” and “Other.”
- **Column Percentages:** Aside from the sample row labeled N, all numbers should be read as column percentages. In the sample table, you can see an arrow pointing to 3 values in the column labeled “Female” within the survey category of “FEMA Damage Level.” The appropriate way to read this statistic is “Of all the females that responded to the question regarding FEMA Damage Level, 22.3 experienced no damage, 49.3 had property that was affected or experienced minor damage, and 28.5 had major damage or their property was destroyed.”
- **Margin of Error:** The margin of error expresses the amount of random sampling error in a survey’s results. It represents the likelihood that the result from a sample is close to the number one would get if the whole population had been surveyed. In this case the margin of error is plus or minus five percentage points, meaning that the population statistic is likely within that range.
- **Statistical Significance:** A p-value helps to determine statistical significance by describing the probability of observing such a large difference if the findings were purely by chance in two groups of exactly the same people. For example, a p-value of 0.01 (or 1%) would mean that the probability of obtaining a difference between two groups that is this large (or larger) is 1%, assuming that the two groups are in fact NOT different. The smaller the p value, the more evidence we have to reject the null hypothesis in favor of the research hypothesis. Statistical significance is identified by asterisks that correspond to the levels of * ≤ 0.05 ** ≤ 0.01 *** ≤ 0.001 .
- **Footnotes:** These are table notes that will be used to provide further clarification on category definitions, data points, or anything else that may not be self-explanatory.
- **Total:** The total column will represent a weighted population figure.

APPENDIX C

PLACE REPORT DATA TABLES

APPENDIX C TABLE 1. S-CAFH SURVEY RESPONDENTS (COLUMN % WEIGHTED DATA)

	ALL	REGION¹		DAMAGE²				CHILDREN IN THE HOME		INCOME				
		NORTH	SOUTH	NONE/AFF	MINOR	MAJOR/DEST	M/D/R³	YES	NO	<\$20K	\$20-50K	\$51-99K	\$100K+	M/D/R
Overall (row %)		30.0	70.0	79.9	9.0	11.0	<0.01	36.5	63.5	8.1	18.3	36.7	23.9	13.0
Gender														
Male	46.6	49.1	45.5	45.4	59.1	45.5	36.3	35.5***	53.0	34.7	51.3	52.0	46.9	31.5
Female	52.7	50.8	53.6	53.9	40.2	54.4	63.7	64.5	46.0	64.6	45.6	48.0	52.8	68.5
M/D/R	0.7	0.1	0.9	0.8	0.7	0.1	0.0	<0.01	1.0	0.8	3.0	0.0	0.2	0.0
Age														
19-35	24.0	43.0**	15.9	25.6	4.7	29.0	0.0	33.9***	18.4	30.8**	22.9	19.9	13.6	52.5
36-64	55.7	44.8	60.4	55.3	75.6	43.0	0.0	65.1	50.4	39.0	42.2	60.2	76.3	34.4
65+	20.2	12.3	23.7	19.1	19.7	28.0	100.0	1.1	31.2	30.2	34.9	19.9	10.0	13.1
Race / Ethnicity														
Non-Hispanic White	75.8	31.9***	88.1	68.7	75.4	85.8	100.0	58.3***	78.6	66.8**	63.5	73.6	81.4	59.2
Non-Hispanic Black	6.7	22.4	4.8	12.0	2.8	1.8	0.0	13.9	7.8	4.1	8.7	8.7	14.9	10.7
Hispanic	11.8	30.6	5.7	13.1	17.8	10.4	0.0	21.8	8.3	28.9	22.4	10.9	2.3	17.0
Asian/Pacific Islander	2.6	10.0	0.7	2.4	1.5	<0.01	0.0	2.6	1.7	<0.01	3.1	2.3	1.4	2.5
Other including M/D/R	3.1	5.1	0.7	3.8	2.4	2.0	0.0	3.4	3.5	0.3	2.3	4.5	<0.01	10.6
Marital Status														
Married/Partnered	57.5	48.1***	61.6	58.8	65.6	41.4	26.9	72.6***	48.9	27.0***	47.8	59.8	87.8	27.8
Single, never married	24.4	38.7	18.2	24.2	18.9	30.3	36.3	18.5	27.7	42.0	22.9	21.2	7.2	55.9
Separated/Divorced/ Widowed	18.1	13.2	20.1	17.0	14.7	28.3	36.1	9.0	23.2	31.0	29.3	19.0	5.0	15.3
M/D/R	0.1	0.0	0.2	<0.01	0.9	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	1.0
Education														
Less than high school	4.7	5.7*	4.2	4.2	11.0	2.5	36.8	6.5	3.6	18.6*	11.2	2.0	<0.01	2.9
High school graduate	54.9	62.5	51.6	54.4	55.6	57.9	36.3	53.5	55.7	55.7	67.5	55.1	39.8	63.8
College graduate	24.5	23.4	24.9	25.5	26.7	14.9	26.9	23.6	24.9	11.1	11.2	23.4	40.2	25.4
Graduate degree	15.5	6.9	19.2	15.3	6.4	24.3	0.0	15.5	15.4	14.3	10.0	18.6	20.0	6.6
Other including M/D/R	0.5	1.5	<0.01	0.6	<0.01	0.4	0.0	0.9	0.3	0.3	0.2	0.8	0.0	1.4
Homeownership Status														
Homeowner	83.3	70.1*	89.0	82.0	93.9	84.4	63.2	75.9*	87.6	53.3**	77.0	86.1	92.5	86.3
Renter	15.4	29.9	9.2	16.4	6.1	15.7	36.8	22.0	11.6	41.9	23.0	13.9	3.9	13.7
Other including M/D/R	1.3	0.0	1.8	1.6	0.0	0.0	0.0	2.2	0.7	4.8	0.0	0.0	3.6	0.0

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¹ North: Bergen, Essex, Hudson, Union, Monmouth, Middlesex Counties; South: Ocean, Cape May, Atlantic Counties

² These categories reflect federal definitions of damage: Destroyed - total loss of structure, structure is not economically feasible to repair, or complete failure to major structural components; Major Damage - substantial failure to structural elements of residence (e.g., walls, floors, foundation), or damage that will take more than 30 days to repair and the home could not be lived in during this time; Minor Damage - home is damaged and uninhabitable, but may be made habitable in a short period of time with repairs; or Affected - some damage to the structure and contents, but still habitable. Destroyed and Major Damage have been combined into one category and Minor Damage and Affected have been combined into one category

³ M/D/R: Missing/Don't Know/Refused

APPENDIX C TABLE 2. HOUSING DAMAGE BY HOUSEHOLD CHARACTERISTICS (COLUMN %)

	ALL	REGION ¹		DAMAGE			CHILDREN IN THE HOME		INCOME			
		NORTH	SOUTH	NONE/AFF	MINOR	MAJOR/DEST	YES	NO	<\$20K	\$20-50K	\$51-99K	\$100K+
Housing Damage Level²												
No Damage/Affected	79.9	86.6	77.1				84.5	77.4	72.4	79.0	81.1	80.9
Minor	9.1	6.9	10.0				6.6	10.5	6.6	10.8	8.0	12.3
Destroyed/Major	11.0	6.5	12.9				8.9	12.2	21.0	10.2	10.9	6.8
Type of Storm Damage												
% who report wind damage	37.8	39.3	37.1	31.0***	79.0	53.3	43.3*	34.5	46.3	36.3	34.3	39.8
% who report flood damage	29.2	21.0*	32.8	17.6***	63.4	85.4	29.3	29.2	40.9	28.6	30.0	26.1
% who report mold damage	16.0	17.9	15.2	10.9***	27.5	44.5	21.9***	12.6	39.5***	19.1	10.6	11.6
Utility Loss³												
% who report loss of heat	79.4	77.3	80.3	76.5*	83.8	96.4	82.7	77.4	77.2	62.2	82.3	84.0
% who report loss of hot water	54.9	57.0	54.0	46.2***	81.0	94.3	51.8	56.6	67.6	51.5	55.9	49.0
% who report loss of electricity	89.1	92.9	87.5	87.9	94.4	93.4	90.3	88.5	87.1	83.0	91.7	88.3
Property Loss												
% who report a destroyed vehicle	9.9	5.4	11.8	7.1**	11.5	28.2	10.2	9.7	14.2	5.3	9.4	16.0

Margins of error for all cells are +/-5 percentage points and based on surveys of 1,000 New Jersey residents, representing 1,047,000 people in the Disaster Footprint. P-values are indicated in the left corner cell of a given section as the following: * ≤ 0.05 ** ≤ 0.01 ***≤0.001

¹ North: Bergen, Essex, Hudson, Union, Monmouth, Middlesex Counties; South: Ocean, Cape May, Atlantic Counties

² These categories reflect federal definitions of damage: Destroyed - total loss of structure, structure is not economically feasible to repair, or complete failure to major structural components; Major Damage - substantial failure to structural elements of residence (e.g., walls, floors, foundation), or damage that will take more than 30 days to repair and the home could not be lived in during this time; Minor Damage - home is damaged and uninhabitable, but may be made habitable in a short period of time with repairs; or Affected - some damage to the structure and contents, but still habitable.

³ Respondents were asked if their home lost the utility service listed at any point during or just after Sandy.

APPENDIX C TABLE 3. HOUSING DAMAGE BY INDIVIDUAL CHARACTERISTICS (COLUMN %)

	ALL	GENDER		AGE			RACE / ETHNICITY				
		MALE	FEMALE	19-35	36-64	65+	NON-HISPANIC WHITE	NON- HISPANIC BLACK	HISPANIC	ASIAN/ PACIFIC ISLANDER	OTHER ¹
Housing Damage Level²											
No Damage/Affected	79.9	77.8	81.8	85.0***	79.2	75.9	77.2	95.5	79.2	93.1	88.7
Minor	9.1	11.5	6.9	1.8	12.3	8.8	9.6	2.5	12.2	6.7	6.0
Destroyed/Major	11.0	10.7	11.3	13.2	8.5	15.3	13.3	2.0	8.6	0.2	5.3
Type of Storm Damage											
% who report wind damage	37.8	37.0	38.8	32.8	42.8	29.7	38.4	35.7	32.8	37.0	30.1
% who report flood damage	29.2	28.9	29.8	22.4	30.5	34.0	31.2	14.5	31.5	39.1	12.5
% who report mold damage	16.0	12.3*	19.5	21.5	13.7	15.7	14.1	19.1	23.5	42.9	1.4
Utility Loss³											
% who report loss of heat	79.4	75.0	83.0	71.5	83.0	78.7	81.2	80.4	76.1	58.5	50.5
% who report loss of hot water	54.9	48.6	59.9	55.4	54.3	55.9	53.7	50.9	64.8	57.9	28.8
% who report loss of electricity	89.1	89.6	88.5	92.4	87.7	89.2	87.1	89.6	95.8	100.0	99.7
Property Loss											
% who report a destroyed vehicle	9.9	11.5	8.5	6.3	10.1	13.5	11.7**	1.9	3.3	36.4	3.7

Margins of error for all cells are +/-5 percentage points and based on surveys of 1,000 New Jersey residents, representing 1,047,000 people in the Disaster Footprint. P-values are indicated in the left corner cell of a given section as the following: * ≤ 0.05 ** ≤ 0.01 ***≤0.001

¹ Other includes Native American, Multiracial, and other races given by respondents

² These categories reflect federal definitions of damage: Destroyed - total loss of structure, structure is not economically feasible to repair, or complete failure to major structural components; Major Damage - substantial failure to structural elements of residence (e.g., walls, floors, foundation), or damage that will take more than 30 days to repair and the home could not be lived in during this time; Minor Damage - home is damaged and uninhabitable, but may be made habitable in a short period of time with repairs; or Affected - some damage to the structure and contents, but still habitable.

³ Respondents were asked if their home lost the utility service listed at any point during or just after Sandy.

APPENDIX C TABLE 4. EVACUATION AND DECISION MAKING BY HOUSEHOLD CHARACTERISTICS (COLUMN %)

	ALL	REGION ¹		DAMAGE ²			CHILDREN IN THE HOME		INCOME			
		NORTH	SOUTH	NONE/AFF	MINOR	MAJOR/DEST	YES	NO	<\$20K	\$20-50K	\$51-99K	\$100K+
Evacuation												
% who evacuated	22.3	12.6	26.5	16.6***	23.4	62.5	23.9	21.4	22.5	23.3	21.5	24.3
% who did not evacuate	77.7	87.4	73.5	83.4	76.6	37.5	76.1	78.6	77.5	76.7	78.5	75.7
% living in mandatory evacuation zones	24.2	0.0	34.6	22.3	35.8	28.7	20.6	26.3	18.7	18.8	27.5	28.2
Among those living in mandatory evacuation zones, % who evacuated	28.1	N/A	28.1	22.0*	14.3	77.4	6.8*	37.7	66.0	25.3	28.3	25.3
Reasons for Evacuating³												
Mandatory evacuation order	47.3	<0.01***	50.4	37.1*	61.8	60.5	35.0	52.7	18.0	35.1	52.9	62.5
Had a safe place to go	44.2	0.0	47.2	39.0	32.4	56.8	30.6	50.2	10.1	29.9	60.2	47.8
Home unsafe	41.0	9.6	43.1	34.9	43.9	50.9	37.4	42.5	4.3*	23.5	49.1	58.6
Thought storm would be bad	29.4	26.3	29.6	27.9	30.3	31.5	45.9	22.1	6.3**	52.6	34.9	12.7
Prior hurricane experience	11.9	0.4***	12.7	11.6	15.6	11.3	12.0	11.9	4.5	6.9	7.5	21.3
Reasons for Not Evacuating⁴												
Thought could be safe in home	44.7	46.8	43.7	45.3	47.5	30.3	40.4	47.1	46.3	41.8	48.4	51.2
No mandatory evacuation	29.9	29.1	30.4	29.8	26.9	37.0	36.3*	26.4	35.8	20.0	32.0	34.5
Didn't think storm would be bad	28.7	29.7	28.2	29.4	28.2	18.3	23.0	31.9	20.6	26.7	29.7	23.1
Stayed home for other hurricanes (not Irene)	10.4	2.8**	14.3	9.8	14.6	13.3	7.6	12.0	3.9*	10.9	5.6	24.0
Wouldn't leave pets	9.1	4.3**	11.5	8.4	15.3	9.5	9.7	8.8	3.1	13.4	9.8	9.7
Concerned about looting	0.8	0.7	0.9	0.5**	0.6	5.5	0.6	0.9	2.9	1.5	0.3	0.7

Margins of error for all cells are +/-5 percentage points and based on surveys of 1,000 New Jersey residents, representing 1,047,000 people in the Disaster Footprint. P-values are indicated in the left corner cell of a given section as the following: * ≤ 0.05 ** ≤ 0.01 *** ≤ 0.001

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² These categories reflect federal definitions of damage: Destroyed - total loss of structure, structure is not economically feasible to repair, or complete failure to major structural components; Major Damage - substantial failure to structural elements of residence (e.g., walls, floors, foundation), or damage that will take more than 30 days to repair and the home could not be lived in during this time; Minor Damage - home is damaged and uninhabitable, but may be made habitable in a short period of time with repairs; or Affected - some damage to the structure and contents, but still habitable.

³ All that apply, top five reasons presented

⁴ All that apply, top five reasons presented

APPENDIX C TABLE 5. EVACUATION AND DECISION MAKING BY INDIVIDUAL CHARACTERISTICS (COLUMN %)

	ALL	GENDER		AGE			RACE / ETHNICITY				
		MALE	FEMALE	19-35	36-64	65+	NON-HISPANIC WHITE	NON- HISPANIC BLACK	HISPANIC	ASIAN/ PACIFIC ISLANDER	OTHER ¹
Evacuation											
% who evacuated	22.3	15.5***	28.7	17.2	23.4	25.6	22.1	32.9	19.9	8.6	8.5
% who did not evacuated	77.7	84.5	71.3	82.8	76.6	74.4	77.9	67.1	80.1	91.4	91.5
% living in mandatory evacuation zones	24.2	20.4***	27.8	15.1*	24.6	34.1	31.7	3.2	8.7	0.0	1.3
Among those living in mandatory evacuation zones, % who evacuated	28.1	18.9*	34.2	15.9	28.2	34.5	27.2	68.0	27.8	N/A	50.1
Reasons for Evacuating²											
Mandatory evacuation order	47.3	51.2	45.1	38.9	42.7	61.0	57.9**	3.3	25.6	0.0	21.4
Had a safe place to go	44.2	40.2	46.3	41.7	37.8	59.1	51.7	9.6	38.0	0.0	0.0
Home unsafe	41.0	43.5	39.7	23.0	42.5	46.2	43.9	33.5	14.1	65.5	82.7
Thought storm would be bad	29.4	29.2	29.6	48.0	24.4	31.2	30.6	19.0	40.9	0.0	0.0
Prior hurricane experience	11.9	6.8	14.6	14.3	7.6	19.9	13.1	4.9	14.0	0.0	0.0
Reasons for Not Evacuating³											
Thought could be safe in home	44.7	48.3	40.0	39.3	45.8	49.0	46.8	40.9	40.1	19.5	67.2
No mandatory evacuation	29.9	29.3	31.2	26.1	31.5	30.7	32.0	15.6	35.6	24.6	12.8
Didn't think storm would be bad	28.7	30.3	27.5	32.8	27.3	27.2	28.4	10.8	30.1	32.0	54.4
Stayed home for other hurricanes (not Irene)	10.4	12.4	8.5	5.1	12.5	11.7	13.5*	1.1	1.4	18.7	0.0
Wouldn't leave pets	9.1	7.2	11.1	4.8	10.4	11.2	11.0	0.2	3.1	19.4	11.6
Concerned about looting	0.8	1.2*	0.4	0.9	0.8	0.6	0.9	0.4	0.9	0.2	0.0

Margins of error for all cells are +/-5 percentage points and based on surveys of 1,000 New Jersey residents, representing 1,047,000 people in the Disaster Footprint. P-values are indicated in the left corner cell of a given section as the following: * ≤ 0.05 ** ≤ 0.01 *** ≤ 0.001

¹ Other includes Native American, Multiracial, and other races given by respondents

² All that apply, top five reasons presented

³ All that apply, top five reasons presented

APPENDIX C TABLE 6. HOUSING INSTABILITY BY HOUSEHOLD CHARACTERISTICS (COLUMN % UNLESS SPECIFIED)

	ALL	REGION ¹		DAMAGE ²			CHILDREN IN THE HOME		INCOME			
		NORTH	SOUTH	NONE/AFF	MINOR	MAJOR/DEST	YES	NO	<\$20K	\$20-50K	\$51-99K	\$100K+
Duration Displaced Among Displaced Residents												
<1 week	13.8	29.2**	10.6	17.6***	15.6	0.5	14.7**	13.2	23.2	10.1	13.3	12.5
1-4 weeks	57.7	59.5	57.3	76.7	43.7	7.6	71.3	48.2	46.3	48.5	53.7	62.2
4 weeks – 3 months	9.0	0.2	10.8	0.3	34.2	20.4	4.0	12.4	1.3	11.2	13.3	7.1
> 3 months	19.6	11.2	21.3	5.4	6.5	71.5	10.0	26.2	29.3	30.3	19.7	18.2
Hosting Others												
% who report hosting others within first 6 months after Sandy	23.0	17.9	25.3	25.1	8.4	20.1	22.5	23.3	13.5	18.0	26.7	22.0
Permanent and Stable Housing												
% who report currently living in permanent and stable housing ³	91.6	90.1	92.2	93.2	85.8	84.4	91.3	91.7	89.6**	82.9	90.6	97.9

Margins of error for all cells are +/-5 percentage points and based on surveys of 1,000 New Jersey residents, representing 1,047,000 people in the Disaster Footprint. P-values are indicated in the left corner cell of a given section as the following: * ≤ 0.05 ** ≤ 0.01 ***≤0.001

¹ North: Bergen, Essex, Hudson, Union, Monmouth, Middlesex Counties; South: Ocean, Cape May, Atlantic Counties

² These categories reflect federal definitions of damage: Destroyed - total loss of structure, structure is not economically feasible to repair, or complete failure to major structural components; Major Damage - substantial failure to structural elements of residence (e.g., walls, floors, foundation), or damage that will take more than 30 days to repair and the home could not be lived in during this time; Minor Damage - home is damaged and uninhabitable, but may be made habitable in a short period of time with repairs; or Affected - some damage to the structure and contents, but still habitable.

³ Permanent and Stable Housing is defined as not having to move within the next year

APPENDIX C TABLE 7. HOUSING INSTABILITY BY INDIVIDUAL CHARACTERISTICS (COLUMN % UNLESS SPECIFIED)

	ALL	GENDER		AGE			RACE / ETHNICITY				
		MALE	FEMALE	19-35	36-64	65+	NON-HISPANIC WHITE	NON- HISPANIC BLACK	HISPANIC	ASIAN/ PACIFIC ISLANDER	OTHER ¹
Duration of Displacement Among Displaced Residents											
<1 week	13.8	15.2	13.0	5.8*	14.0	21.6	12.1	15.7	20.7	0.1	53.0
1-4 weeks	57.7	45.9	64.3	79.6	58.0	33.7	55.6	70.1	61.4	99.3	27.4
4 weeks – 3 months	9.0	14.7	5.7	5.9	11.5	5.6	9.9	2.2	9.1	0.6	0.0
> 3 months	19.6	24.2	17.0	8.7	16.5	39.1	22.4	12.0	8.8	0.0	19.6
Hosting Others											
% who report hosting others within first 6 months after Sandy	23.0	23.0	22.3	25.9	24.2	16.1	23.0	20.6	20.2	35.6	48.9
Permanent and Stable Housing											
% who report currently living in permanent and stable housing ²	91.6	90.7	92.3	91.5	92.0	90.5	93.0	90.8	89.0	66.7	83.9

Margins of error for all cells are +/-5 percentage points and based on surveys of 1,000 New Jersey residents, representing 1,047,000 people in the Disaster Footprint. P-values are indicated in the left corner cell of a given section as the following: * ≤ 0.05 ** ≤ 0.01 ***≤0.001

- ¹ Other includes Native American, Multiracial, and other races given by respondents
² Permanent and Stable Housing is defined as not having to move within the next year

APPENDIX C TABLE 8. INSURANCE STATUS BY HOUSEHOLD CHARACTERISTICS (COLUMN %)

	ALL	REGION ¹		DAMAGE ²			CHILDREN IN THE HOME		INCOME			
		NORTH	SOUTH	NONE/AFF	MINOR	MAJOR/DEST	YES	NO	<\$20K	\$20-50K	\$51-99K	\$100K+
Among Homeowners												
% who report having homeowner's insurance	97.6	99.9***	96.8	99.0*	90.8	94.1	99.7***	96.5	89.2	95.3	99.7	96.5
Among those with homeowner's insurance, % who filed a claim for damage from Sandy	29.8	28.3	30.3	18.0***	60.3	90.7	32.6	28.3	28.2	23.9	28.7	33.8
% who report having windstorm insurance	17.7	13.4	19.5	10.7***	43.1	40.9	11.5*	20.8	9.2	22.8	12.9	18.9
Among those with windstorm insurance, % who filed a claim for damage from Sandy	53.1	65.1	49.4	13.2***	90.0	87.3	50.0	54.0	30.6	61.3	45.2	37.9
% who report having flood insurance	35.1	29.8	37.3	28.8***	42.7	69.4	36.8	34.1	8.6**	22.7	38.7	46.4
Among those with flood insurance, % who filed a claim for damage from Sandy	46.3	15.0*	55.6	21.9***	87.5	87.9	30.4***	55.7	62.6	41.9	55.1	37.6
Among Renters												
% who report having renter's insurance	37.3	31.2	45.5	38.7	15.8	30.7	36.0	38.3	22.6	30.8	47.5	58.5
Among those with renter's insurance, % who filed a claim for damage from Sandy	12.2	3.7	18.7	1.4***	99.4	99.8	24.3*	1.9	0.0	23.5	7.1	10.4

Margins of error for all cells are +/-5 percentage points and based on surveys of 1,000 New Jersey residents, representing 1,047,000 people in the Disaster Footprint. P-values are indicated in the left corner cell of a given section as the following: * ≤ 0.05 ** ≤ 0.01 *** ≤ 0.001

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APPENDIX C TABLE 9. INSURANCE STATUS BY INDIVIDUAL CHARACTERISTICS (COLUMN %)

	ALL	GENDER		AGE			RACE & ETHNICITY				
		MALE	FEMALE	19-35	36-64	65+	NON-HISPANIC WHITE	NON- HISPANIC BLACK	HISPANIC	ASIAN/ PACIFIC ISLANDER	OTHER¹
Among Homeowners											
% who report having homeowner’s insurance	97.6	97.2	97.9	99.9	98.1	94.7	97.3	98.3	99.1	100.0	100.0
Among those with homeowner’s insurance, % who filed a claim for damage from Sandy	29.8	30.7	29.3	18.6	34.4	24.5	29.7	37.8	33.6	0.9	4.3
% who report having windstorm insurance	17.7	21.7	14.0	12.1**	12.6	37.6	20.1	4.4	18.7	0.0	9.2
Among those with windstorm insurance, % who filed a claim for damage from Sandy	53.1	56.9	47.2	66.5	52.5	49.6	50.3	71.0	66.0	N/A	37.0
% who report having flood insurance	35.1	35.1	34.3	39.2	35.8	29.1	35.5	50.6	18.9	7.9	46.7
Among those with flood insurance, % who filed a claim for damage from Sandy	46.3	46.8	47.5	16.9***	46.9	78.3	53.4***	6.7	55.7	10.4	11.8
Among Renters											
% who report having renter’s insurance	37.3	50.4*	16.9	37.5	40.0	21.7	34.9*	34.5	25.8	53.9	99.3
Among those with renter’s insurance, % who filed a claim for damage from Sandy	12.2	3.2**	51.1	14.0	9.3	21.5	10.9	0.0	42.8	0.0	0.0

Margins of error for all cells are +/-5 percentage points and based on surveys of 1,000 New Jersey residents, representing 1,047,000 people in the Disaster Footprint. P-values are indicated in the left corner cell of a given section as the following: * ≤ 0.05 ** ≤ 0.01 ***≤0.001

¹ Other includes Native American, Multiracial, and other races given by respondents

APPENDIX C TABLE 10. HOUSING AND OTHER ASSISTANCE NEEDS BY HOUSEHOLD CHARACTERISTICS (COLUMN %)

	ALL	REGION ¹		DAMAGE ²			CHILDREN IN THE HOME		INCOME			
		NORTH	SOUTH	NONE/AFF	MINOR	MAJOR/DEST	YES	NO	<\$20K	\$20-50K	\$51-99K	\$100K+
% who report having a problem or needing assistance with restoring their home	16.4	10.3*	19.0	6.1***	40.8	74.2	12.8	18.3	30.2	17.1	16.4	11.6
Among those reporting a problem, % who applied for assistance	79.7	86.0	78.2	67.9	83.7	85.3	89.1*	76.2	31.4	88.1	83.5	87.6
% who report having a problem or needing assistance with elevating their home	6.4	0.5***	8.9	1.4***	6.0	46.5	5.7	6.7	2.3	5.8	8.6	6.2
Among those reporting a problem, % who applied for assistance	83.8	99.8***	83.4	52.7*	68.6	93.4	66.2*	92.0	95.1	74.8	95.4	64.6
% who report having a problem or needing assistance with cleaning debris	19.2	12.1	22.1	11.7***	32.6	62.9	17.2	20.3	35.9	17.0	18.7	19.2
Among those reporting a problem, % who applied for assistance	41.0	18.3**	46.5	27.5**	39.5	62.7	27.3	47.9	43.0	23.8	49.5	41.6
% who report having a problem or needing assistance with getting housing	2.7	0.6*	3.6	1.0***	2.5	15.5	3.2	2.4	4.9*	5.6	2.3	1.3
Among those reporting a problem, % who applied for assistance	54.7	35.1	56.4	26.5	63.7	60.2	37.5*	73.2	34.2	80.8	45.5	46.7
% who report having a problem or needing assistance with paying their rent/ mortgage	7.4	5.1	8.3	4.2***	9.3	29.4	10.2	5.6		14.4	3.7	3.3
Among those reporting a problem, % who applied for assistance	56.3	59.3	55.5	32.1**	70.6	77.9	51.0	62.1	71.4	32.8	54.3	82.5
% who report having a problem or needing assistance with furnishing their home	6.7	4.3	7.8	2.0***	10.6	37.8	6.3	7.0	11.4**	13.0	5.8	3.6
Among those reporting a problem, % who applied for assistance	47.0	16.0**	54.5	11.2**	36.9	64.2	43.5	48.7	45.4*	25.5	65.1	67.2
% who report having a problem or needing assistance with paying utilities	11.7	14.3	10.7	10.2	16.6	18.8	16.0*	9.2	34.0**	20.3	8.5	3.2
Among those reporting a problem, % who applied for assistance	42.2	30.3	48.9	34.0	40.6	71.4	44.8	39.3	39.4	50.3	25.1	78.0

Margins of error for all cells are +/-5 percentage points and based on surveys of 1,000 New Jersey residents, representing 1,047,000 people in the Disaster Footprint. P-values are indicated in the left corner cell of a given section as the following: * ≤ 0.05 ** ≤ 0.01 *** ≤ 0.001

¹ North: Bergen, Essex, Hudson, Union, Monmouth, Middlesex Counties; South: Ocean, Cape May, Atlantic Counties

² These categories reflect federal definitions of damage: Destroyed - total loss of structure, structure is not economically feasible to repair, or complete failure to major structural components; Major Damage - substantial failure to structural elements of residence (e.g., walls, floors, foundation), or damage that will take more than 30 days to repair and the home could not be lived in during this time; Minor Damage - home is damaged and uninhabitable, but may be made habitable in a short period of time with repairs; or Affected - some damage to the structure and contents, but still habitable.

APPENDIX C TABLE 11. HOUSING AND OTHER ASSISTANCE NEEDS BY INDIVIDUAL CHARACTERISTICS (COLUMN %)

	ALL	GENDER		AGE			RACE & ETHNICITY				
		MALE	FEMALE	19-35	36-64	65+	NON-HISPANIC WHITE	NON- HISPANIC BLACK	HISPANIC	ASIAN/ PACIFIC ISLANDER	OTHER ¹
% who report having a problem or needing assistance with restoring their home	16.4	16.3	16.7	10.2	16.7	22.4	18.4	12.8	10.7	0.5	7.4
Among those reporting a problem, % who applied for assistance	79.7	81.2	78.3	96.4	75.8	79.2	78.6	91.9	88.0	82.6	45.7
% who report having a problem or needing assistance with elevating their home	6.4	5.9	6.8	1.9*	6.9	9.9	7.4	7.8	0.9	0.0	3.0
Among those reporting a problem, % who applied for assistance	83.8	92.6	77.0	71.9	82.0	89.8	91.8***	25.6	88.4	N/A	100.0
% who report having a problem or needing assistance with cleaning debris	19.2	19.4	19.1	9.1**	19.9	28.6	19.7	15.1	20.9	25.6	8.0
Among those reporting a problem, % who applied for assistance	41.0	37.3	44.9	24.2	38.5	51.4	49.3***	41.6	6.5	0.8	12.8
% who report having a problem or needing assistance with getting housing	2.7	1.4**	3.9	2.2	3.1	2.2	2.7	5.4	1.6	<0.01	0.6
Among those reporting a problem, % who applied for assistance	54.7	75.3	46.2	22.1	65.4	62.2	52.9	100.0	39.2	0.0	100.0
% who report having a problem or needing assistance with paying their rent/ mortgage	7.4	7.2	7.6	10.8	6.7	5.2	5.7	13.1	8.9	6.0	19.9
Among those reporting a problem, % who applied for assistance	56.3	54.6	57.5	52.0	53.0	77.7	74.4**	16.4	30.5	3.5	99.7
% who report having a problem or needing assistance with furnishing their home	6.7	5.6	7.7	5.5	7.1	7.2	6.1	8.8	10.2	0.2	3.8
Among those reporting a problem, % who applied for assistance	47.0	42.0	50.8	27.1	49.5	55.9	60.1**	16.4	20.9	77.3	94.5
% who report having a problem or needing assistance with paying utilities	11.7	10.4	13.0	14.2	12.2	7.6	7.3***	31.4	20.5	0.6	19.7
Among those reporting a problem, % who applied for assistance	42.2	30.1	51.2	42.7	39.4	52.3	42.3	38.8	35.6	79.7	99.7

Margins of error for all cells are +/-5 percentage points and based on surveys of 1,000 New Jersey residents, representing 1,047,000 people in the Disaster Footprint. P-values are indicated in the left corner cell of a given section as the following: * ≤ 0.05 ** ≤ 0.01 ***≤0.001

¹ Other includes Native American, Multiracial, and other races given by respondents

APPENDIX C TABLE 12. ECONOMIC BURDEN OF HOUSING BY HOUSEHOLD CHARACTERISTICS (COLUMN %)

	ALL	REGION ¹		DAMAGE ²			CHILDREN IN THE HOME		INCOME			
		NORTH	SOUTH	NONE/AFF	MINOR	MAJOR/DEST	YES	NO	<\$20K	\$20-50K	\$51-99K	\$100K+
In the 30 days after the storm, % who reported difficulty³ paying for...												
Housing costs	23.5	26.4	22.3	16.8***	45.2	52.9	31.0**	19.1	47.6***	39.1	20.8	5.4
Generators	22.4	20.9	23.1	20.1*	37.1	29.2	32.7*	16.4	16.2	20.6	24.0	25.2
Clearing debris	26.1	23.1	27.3	17.6***	55.3	65.6	26.7	25.7	37.1	30.3	23.3	23.6
Savings spent on recovery expenses												
% who report spending all/quite a bit	12.2	13.8**	11.6	5.7***	18.7	53.8	15.5*	10.3	27.8***	13.9	8.7	7.0
% who report spending a moderate amount	12.6	3.1	15.7	9.2	17.3	27.7	11.5	12.3	6.2	14.1	11.6	15.4
% who report spending a little/none	70.1	72.6	69.0	79.8	54.8	12.3	64.6	73.2	46.2	66.7	76.2	76.9
% who report having no savings	5.7	10.5	3.7	5.2	9.2	6.2	8.4	4.1	19.9	5.3	3.5	0.7
Credit spent on recovery expenses												
% who report spending all/quite a bit	5.9	3.8	6.8	2.8***	14.5	20.9	8.4*	4.5	20.5**	8.4	3.9	2.8
% who report spending a moderate amount	6.8	5.9	7.2	4.6	10.4	20.1	9.4	5.3	3.9	3.6	8.4	4.4
% who report spending a little/none	83.4	86.2	82.3	89.1	72.0	51.6	74.8	88.4	62.4	81.2	84.2	92.6
% who report having no credit available	3.9	4.2	3.8	3.5	3.1	7.4	7.5	1.8	13.3	6.8	3.4	0.2
Recovery Programs												
% who heard of SHRAP	23.1	12.9**	27.4	20.5**	15.9	47.2	15.0**	27.8	7.5	28.4	28.4	24.3
Among those who heard of SHRAP, % who applied for SHRAP	20.0	20.1	20.0	5.6***	33.1	62.0	27.7	17.6	37.3	15.6	21.5	18.3
% who applied for other government housing recovery funds	16.5	15.8	16.8	7.7***	21.7	77.6	13.9	18.1	19.5	17.4	18.3	10.0

Margins of error for all cells are +/-5 percentage points and based on surveys of 1,000 New Jersey residents, representing 1,047,000 people in the Disaster Footprint. P-values are indicated in the left corner cell of a given section as the following: * ≤ 0.05 ** ≤ 0.01 *** ≤ 0.001

¹ North: Bergen, Essex, Hudson, Union, Monmouth, Middlesex Counties; South: Ocean, Cape May, Atlantic Counties

² These categories reflect federal definitions of damage: Destroyed - total loss of structure, structure is not economically feasible to repair, or complete failure to major structural components; Major Damage - substantial failure to structural elements of residence (e.g., walls, floors, foundation), or damage that will take more than 30 days to repair and the home could not be lived in during this time; Minor Damage - home is damaged and uninhabitable, but may be made habitable in a short period of time with repairs; or Affected - some damage to the structure and contents, but still habitable.

³ Difficulty is measured by respondent answering "somewhat difficult" or "very difficult"

APPENDIX C TABLE 13. ECONOMIC BURDEN OF HOUSING BY INDIVIDUAL CHARACTERISTICS (COLUMN %)

	ALL	GENDER		AGE			RACE / ETHNICITY				
		MALE	FEMALE	19-35	36-64	65+	NON-HISPANIC WHITE	NON- HISPANIC BLACK	HISPANIC	ASIAN/ PACIFIC ISLANDER	OTHER ¹
In the 30 days after the storm, % who reported difficulty² paying for...											
Housing costs	23.5	18.3	27.3	36.8***	22.7	10.1	18.7***	15.5	52.8	34.5	20.6
Generators	22.4	15.1	28.1	22.9*	26.9	10.0	22.3	18.2	30.5	6.6	22.4
Clearing debris	26.1	24.6	27.6	22.5*	27.4	26.8	26.0**	28.9	33.3	7.0	0.4
Savings spent on recovery expenses											
% who report spending all/quite a bit	12.2	10.2	14.1	15.5	13.0	6.4	10.4*	18.9	20.1	4.3	4.1
% who report spending a moderate amount	12.6	14.1	9.1	4.4	13.1	17.7	14.8	3.3	6.3	5.7	0.3
% who report spending a little/none	70.1	74.0	67.6	70.7	68.5	73.5	70.1	71.2	62.6	83.3	95.6
% who report having no savings	5.7	1.6	9.2	9.4	5.3	2.5	4.8	6.5	11.0	6.7	<0.01
Credit spent on recovery expenses											
% who report spending all/quite a bit	5.9	5.3***	6.5	3.8	7.2	4.6	4.9	6.6	11.4	9.5	0.4
% who report spending a moderate amount	6.8	2.0	11.0	9.2	7.4	2.6	6.4	9.3	8.8	0.5	3.1
% who report spending a little/none	83.4	92.0	76.9	78.6	82.4	91.7	86.3	78.6	68.0	90.0	95.6
% who report having no credit available	3.9	0.7	5.6	8.4	3.1	1.2	2.4	5.5	11.8	0.0	0.9
Recovery Programs											
% who heard of SHRAP	23.1	24.6	20.8	13.1	26.4	25.1	26.9*	8.5	14.9	18.5	12.7
Among those who heard of SHRAP, % who applied for SHRAP	20.0	24.7	16.2	24.2*	14.7	33.1	20.1***	1.9	6.4	99.5	38.8
% who applied for other government housing recovery funds	16.5	18.1	15.3	16.1	14.6	22.5	17.0	21.3	13.1	15.6	5.7

Margins of error for all cells are +/-5 percentage points and based on surveys of 1,000 New Jersey residents, representing 1,047,000 people in the Disaster Footprint. P-values are indicated in the left corner cell of a given section as the following: * ≤ 0.05 ** ≤ 0.01 ***≤0.001

¹ Other includes Native American, Multiracial, and other races given by respondents

² Difficulty is measured by respondent answering “somewhat difficult” or “very difficult”

APPENDIX C TABLE 14. COMMUNITY FACTORS BY HOUSEHOLD CHARACTERISTICS (COLUMN %)

	ALL	REGION ¹		DAMAGE ²			CHILDREN IN THE HOME		INCOME			
		NORTH	SOUTH	NONE/AFF	MINOR	MAJOR/DEST	YES	NO	<\$20K	\$20-50K	\$51-99K	\$100K+
Sense of Community³												
% with strong sense of community membership	70.5	61.1	74.5	69.2	78.2	74.5	69.7	71.0	65.2	63.3	73.4	79.4
% with strong sense of emotional connection to community	52.8	39.4*	58.1	51.5	45.4	68.1	52.6	52.9	32.9**	60.1	60.8	47.1
% with strong sense of influence	46.9	43.5	48.4	49.0	18.0	54.0	47.2	46.8	36.9*	33.0	59.7	44.7
% with strong sense of trust in governance and social institutions	65.8	57.5	69.1	65.2	61.3	73.5	60.7	68.6	55.0*	71.8	67.5	58.6
Physical Disorder⁴												
% Frequently worried	12.4	25.8**	6.6	12.9	5.1	14.9	18.6**	8.8	26.6*	11.6	10.6	10.3
% Moderately worried	66.9	62.5	68.8	67.4	65.0	65.1	62.3	69.5	65.5	71.6	71.4	63.1
% Rarely or not worried	20.8	11.7	24.6	19.8	29.9	20.0	19.0	21.7	7.9	16.8	18.0	26.6
Community Environment⁵												
% Frequently worried about their neighborhood	2.7	7.5**	0.7	2.2*	0.2	8.1	3.5**	2.2	13.5*	0.8	2.0	2.6
% Moderately worried about their neighborhood	53.3	63.5	49.0	54.8	37.1	56.0	59.4	49.8	61.4	55.7	44.0	50.5
% Rarely or not worried about their neighborhood	44.0	29.1	50.3	43.0	62.7	35.9	37.1	47.9	25.1	43.5	53.9	46.9

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³ As measured by the Sense of Community scale

⁴ Measures include questions regarding drug dealers, having property stolen, walking alone during the day, letting children go outside during the day, letting children go outside at night, being robbed, and being murdered.

⁵ Measures include questions on litter or trash on sidewalks or streets, graffiti, abandoned cars, vacant or boarded up buildings, houses and yards not kept up, drinking in public, gang activity

APPENDIX C TABLE 15. COMMUNITY FACTORS BY INDIVIDUAL CHARACTERISTICS (COLUMN %)

	ALL	GENDER		AGE			RACE / ETHNICITY				
		MALE	FEMALE	19-35	36-64	65+	NON-HISPANIC WHITE	NON- HISPANIC BLACK	HISPANIC	ASIAN/ PACIFIC ISLANDER	OTHER ¹
Sense of Community²											
% with strong sense of community membership	70.5	71.7	69.1	61.8	72.9	74.0	77.7*	50.0	47.8	65.9	45.1
% with strong sense of emotional connection	52.8	54.0	51.0	21.3***	59.2	72.3	59.9***	39.6	31.0	28.3	23.5
% with strong sense of influence	46.9	51.5	43.0	40.4	45.6	59.0	50.6	40.0	25.8	38.8	60.1
% with strong sense of trust in governance and social institutions	65.8	66.2	64.8	64.4	61.7	78.5	70.2	46.0	57.6	42.6	77.7
Physical Disorder³											
% Frequently worried	12.4	11.9	13.0	22.4	10.6	5.4	6.5***	29.1	29.2	34.1	11.9
% Moderately worried	66.9	64.1	69.0	50.8	68.6	81.3	69.2	61.3	52.2	65.7	87.8
% Rarely or not worried	20.8	24.0	18.0	26.8	20.9	13.3	24.3	9.6	18.6	0.2	0.3
Community Environment⁴											
% Frequently worried about their neighborhood	2.7	3.6	2.0	7.0***	1.5	0.8	1.6**	1.1	10.9	0.1	0.0
% Moderately worried about their neighborhood	53.3	49.4	57.3	66.4	52.8	39.1	47.3	73.9	60.7	61.0	89.1
% Rarely or not worried about their neighborhood	44.0	47.0	40.7	26.6	45.6	60.1	51.1	25.1	28.4	38.9	10.1

Margins of error for all cells are +/-5 percentage points and based on surveys of 1,000 New Jersey residents, representing 1,047,000 people in the Disaster Footprint. P-values are indicated in the left corner cell of a given section as the following: * ≤ 0.05 ** ≤ 0.01 ***≤0.001

¹ Other includes Native American, Multiracial, and other races given by respondents

² As measured by the Sense of Community scale

³ Measures include questions regarding drug dealers, having property stolen, walking alone during the day, letting children go outside during the day, letting children go outside at night, being robbed, and being murdered.

⁴ Measures include questions on litter or trash on sidewalks or streets, graffiti, abandoned cars, vacant or boarded up buildings, houses and yards not kept up, drinking in public, gang activity

