INFLUENCE OF HOUSEHOLD RECOVERY CAPACITY AND URGENCY ON POST-DISASTER RELOCATION

A Case Study of The Rockaways, NY after Hurricane Sandy

Report submitted to the Quick Response Grant Program of the Natural Hazards Center, Boulder CO

By

Divya Chandrasekhar, Texas Southern University, ChandrasekharD@tsu.edu

Donovan Finn, Stony Brook University, Donovan.Finn@stonybrook.edu

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STUDY BACKGROUND

Disaster recovery is often defined as the reestablishing of patterns of everyday life for disaster-affected households, and potentially improving their resiliency to future disaster events. Yet our knowledge of household-level recovery decision-making and its implications for disaster management is sorely limited. This deficit is reflected in the continued failure of disaster policy and planning to provide equitable and timely aid to affected households (Comerio, 1998; Mukherji, 2008; Chandrasekhar, 2010) and prevent negative externalities such as forced relocation (Oxfam, 2012). A better understanding of the complexity and dynamism of household recovery decision-making can help address these failures—a need that is particularly relevant given the recent rise in the number and frequency of catastrophic events worldwide.

Few studies have empirically studied post-disaster recovery and those that have, have done so at the communitywide scale by quantitatively measuring the rate of population return, housing repair, infrastructure reconstruction and/or rate of business return (Finch, Emrich, & Cutter, 2010; Chang, 2010). Studies on household-level recovery are fewer still, are mostly also quantitative, and have often focused on one single aspect of the phenomena or another, such as regaining of domestic assets (Arlikatti, Peacock, Prater, Grover, & Sekar, 2010), housing reconstruction (Peacock, Dash, & Zhang, 2006) or livelihood restoration (Nakabayashi, 1990). But there are gaps. First, most existing research focuses on factors external to the household decision process, such as housing and infrastructure provision. Second, existing research often treats households as beneficiaries, as opposed to agents, of recovery action. Even studies that do acknowledge a household's agency (such as Arlikatti, et al.'s 2010 domestic asset study) focus more on the outcomes as opposed to the action process. Last but not least, existing research does not account for the effect of time criticality and changing recovery needs on a household's decision process—two conditions that are integral aspects of post-disaster recovery (Olshansky, 2005). As a result of these gaps, we lack a nuanced explanation of how a household's recovery decision process unfolds over the course of recovery as well as the effect on recovery of the households' own recovery capacity (namely, the ability to access and utilize resources). This knowledge can potentially lead to more targeted and timely policy and planning intervention and improve the chances of successful household recovery.

This pilot study addresses these unexplored research opportunities by investigating how various household attributes such as socio-demographics (e.g. race, age, income) and social connections and capacity influence decisions to stay in place or relocate. The study site is the Rockaway Peninsula of New York City, a collection of neighborhoods that experienced severe devastation when Superstorm Sandy made landfall on October 29, 2012 along the east coast of the United States. Thousands of homes and businesses in the Rockaways were completely flooded, critical infrastructure destroyed and an entire neighborhood of over 100 homes completely destroyed by fire. Its socio-economic makeup, relative isolation from other neighborhoods and vulnerable location have created additional challenges for distribution of local and federal assistance, thus making it a suitable case study for this research.

CONCEPTUAL FRAMEWORK

A household's recovery depends on its capacity to access and utilize economic, social, and institutional resources to meet its specific needs, such as housing or income, in a timely manner. A household's *economic recovery capacity* refers to its ability to find and sustain employment, livelihood and earnings. A household's *social recovery capacity* refers to its ability to transform social assets such as sense of community, social networks, and family support to expedite its decision processes. A household's *institutional knowledge capacity* refers to its ability to obtain aid and support from multi-sector organizations such as local, state and federal government, and private and nonprofit organizations. Lastly, a household's recovery may be affected by its sense of urgency, defined as its constant re-prioritization of needs ('what first?') and its desired timeliness of action ('how soon?') (Mitchell, Agle, & Wood, 1997).

Each of these capacities in turn depends on the household's demographic, socio-economic and locational characteristics. For instance, economic capacity of a household depends on its woman-headed or elderly status, its wealth, education, livelihood profile, and physical distance from markets (Morrow, 1999; Little, Smith, Cellarius, Coppock, & Barrett, 2001; Tierney, 2006). Social capacity depends on established civil society and trust relationships (Nakagawa & Shaw, 2004; Shaw & Goda, 2004; Prater, Peacock, Arlikatti, & Grover, 2006), while a household's institutional capacity depends to a large degree on its political connections as well as its racial, ethnic, immigrant and linguistic profile (Fothergill, Maestas, & Darlington, 1999). A household's sense of urgency on the other hand, while being extremely influential in its decision behavior (Chandrasekhar, 2012) is also one of the least studied or understood dimensions of recovery. This is one of the key knowledge gaps that this study aims to fill.

THE ROCKAWAYS

Hurricane Sandy made landfall on the Northeast coast of the United States on October 29th 2012 and by most emerging estimates will become one of the costliest disaster events in the history of the United States, with costs in New York and New Jersey alone topping $70 billion. In parts of New York City, winds from Sandy reached gusts of over 70 miles per hour and storm surges exceeded 13 feet. Impacts were widespread and affected almost every aspect of life in the city. At least 43 New York City residents were killed by the storm, and 900,000 business and residential customers were left without power in the immediate aftermath of the storm. New York's transit system, the country's largest, suffered massive damage. Seven of 14 subway tunnels connecting Manhattan with the outer boroughs of Brooklyn and Queens were completely flooded, as were two vehicular tunnels and multiple bus and subway train storage yards. Subway service was suspended completely for 72 hours, with repairs on some lines taking weeks longer.

One of the hardest hit parts of the city was the Rockaway Peninsula (see Map 1) along the southern edge of the boroughs of Brooklyn and Queens (administratively the peninsula, known colloquially as The Rockaways, is part of Queens). Home to 114,978 New York City residents in nine named neighborhoods[1], The Rockaways are uniquely idiosyncratic for New York City. In addition to full time residents living in a mix of small apartment buildings, rental apartment towers and suburban-style single family homes, the coastal community also contains thousands of seasonal residences ranging from multi-million dollar beachfront mini-mansions to condominium apartments and un-insulated bungalows. Additionally, The Rockaways contain six New York City Housing Authority (NYCHA) complexes, home to 10,100 residents, or 8.7% of the peninsula's population. Total population of the Rockaways is almost evenly divided between whites (42.7% of the population) and blacks (41.7% of the population), while 21% of the population reports being Latino of any race. However, these racial dynamics are more nuanced at the fine-grained level. For instance, parts of The Rockaways such as Breezy Point and Roxbury neighborhoods are 98.1% white, whereas he Arvene is 66.4% African-American.

During Sandy large portions of the Rockaways experienced extensive damage from storm surge, which topped out at more than 10 feet, flooding thousands of homes and businesses, lifting some off their foundations. Sand was deposited up to three feet deep on inland streets, thousands of cars were destroyed, the boardwalk along the Atlantic coast was obliterated, and 111 homes were destroyed in a massive fire in the Breezy Point neighborhood – a neighborhood of densely packed single family homes on the peninsula's western tip known as a "cop and firefighter" neighborhood. After the storm, utilities and essential services were slow to return. The isolated community was without power for days, and in some

[1] For the purposes of this study we have also included the Broad Channel neighborhood, which is not technically part of the Rockaways. Broad Channel, does, however share a zip code with the Rockaway Beach neighborhood; and Broad Channel plus the Rockaways comprise the entirety of the Queens Community Board 14 district, an administrative sub-unit of New York City.

places weeks. The A train, the only subway line serving The Rockaways, was suspended for 7 months after the storm destroyed 1,500 feet of track, damaged 3 more miles, destroyed two stations and corroded electronic equipment and wiring.

Map 1: New York City map with detail of the Rockaways and Broad Channel (Source: NYC.gov)

Rockaway businesses were also struck extremely hard. Due to the peninsular location residents without cars, or among the thousands whose cars were destroyed by floodwaters, rely heavily on local businesses. A 2013 report by the New York Metro Chapter of the American Planning Association, *Getting Back to Business: Addressing the Needs of Rockaway Businesses Impacted by Superstorm Sandy* reported that 90% of the 1,000+ businesses represented by Rockaway Development & Revitalization Corporation closed for some period of time because of the storm, and more than 600 were still closed four months afterward (American Planning Association-New York Metro Chapter 2013). In particular many grocery stores, of which there were few prior to the storm, were closed for months, and some are still shuttered almost a year afterward.

Press coverage of the Rockaways after the storm was extensive, focusing on not only the widespread and powerful destruction of the area, but also the "can do" spirit of a community of predominantly poor, working class and middle class New Yorkers where the per capita income of $21,172, is $5,000 less than Queens overall and more than $40,000 lower than Manhattan (American Planning Association-New York Metro Chapter 2013). Neighbors formed *ad hoc* patrols to prevent looting, gut one another's homes, and where neighborhood institutions such as the Rockaway Surf Club became de facto community centers and disaster relief centers. Concurrent with laudatory reports of the community's self-help attitude were powerful critiques of city, state and federal response, such as the New York Daily News headline from four days after the storm made landfall, "'We have nothing.' Hungry residents of the Rockaways say they feel abandoned after Hurricane Sandy devastated their home," which went on to note, "Cops were nowhere to be seen and workers from the Long Island Power Authority, which supplies power to the area, reportedly inspected the area Thursday and haven't been seen since" (Trapasso and Siemaszko, 2012). In addition to the 111 homes burned to the ground in Breezy Point, in neighborhoods like Belle Harbor and Rockaway Park on the Atlantic coast, almost every home was damaged by the storm (Voien, 2012).

RESEARCH QUESTIONS

There were two objectives of this study:

1. To examine the effect of a household's social recovery capacity, economic recovery capacity, institutional knowledge capacity and urgency for action on decisions to stay-in-place or relocate.
2. To test the survey instrument and to identify specific challenges in data collection during recovery phase.

The data and experiences from this study will help us improve the methodology of our large sample, longitudinal study of post-Sandy community recovery in New York State. This study is funded by the National Science Foundation (CMMI 1333155, 1335109 & 1333132) and will begin in September 2013.

DATA COLLECTION AND ANALYSIS

A total of 100 surveys were distributed by hand to homes within Rockaways. First a random sample of 20 blocks was drawn using ArcGIS for the entire community and a "survey zone number" assigned to each block. Then, 10 survey packets were distributed by hand within each survey zone to homes that showed signs of occupancy or reconstruction activity. No distinction was made between owned or rented homes, however surveys could not be distributed to large public housing complexes because there is no easy means of public access. This is a serious limitation to this survey since public housing complexes comprise a significant portion of low-income housing in the Rockaways and a limitation that can be overcome with mailed surveys.

Each survey packet consisted of an informational sheet with contact information of the investigators, a blank household survey, and instructions on how to return the survey using a sealable envelope which was also provided. The use of sealed envelopes helped maintain the confidentiality of survey respondents. The sealed envelopes containing the surveys were mailed back by respondents using self addressed stamped envelopes included with the survey form.

To support survey data, we also conducted 5 semi-structured, open-ended interviews with local residents (1 full time resident homeowner, 2 part-time resident homeowners and 2 renters). Survey data has been analyzed using descriptive statistics and interview data was analyzed using conceptual content analysis techniques. Findings have been reported under the different the conceptual categories laid out in the conceptual framework section.

Response Rate

A total of 24 responses (24%) were received with one survey returned with blank responses. The low response rate for the survey was possibly due to the short time frame of data collection and the general busy demands of recovery for the respondents. The survey response rate may also have been affected by the lengthiness of the survey instrument, which contained 50 questions in total (this issue is discussed more in detail in the section, *Methodological Challenges*). There are a few ways to potentially improve the response rate in future surveys. Increasing the time period of data collection may increase response rate for future surveys substantially. Response rate would also be increased by distributing a round of "reminder" notices at a mid-point in time to help remind busy households to complete the survey.

While the low response rate inhibits our ability to make statistically generalizable conclusions about the study findings, we were able to collect rich exploratory data on household decision-making on recovery and the challenges they face. It also allowed us to check the survey instrument for its internal consistency, length, and its ease of comprehension for its future application in a larger sample, longitudinal study. Additionally, many answers to the open-ended survey questions as well as the semi-structured interviews provided rich data that will help refine our conceptual framework, working research hypotheses and survey questions.

Limitations and Methodological Challenges

Limitations to the study arise mostly from time and monetary constraints. We expect that the large sample and longer duration NSF study will help address some of these limitations. The most significant methodological challenges we faced in this survey related to our inability to capture recovery decisions of low-income populations and to the lengthiness of the survey instrument. In this study, we conducted the surveys in person using a drop-off and mail-in method which worked well for single family homes and small apartment buildings, but not as well for high-rise apartment complexes and other buildings with restricted access, including public housing but also including the many large market rate rental buildings and condominium and cooperative apartment complexes common along the Atlantic waterfront and in some newly redeveloped areas such as Arvene by the Sea, a new mixed use development in the center of the peninsula. This affected the representativeness of the sample set and prevented us from making generalized conclusions from its results. To resolve this issue, we will use the mail-in method for surveying households in our next round of data collection since it provides us access to households we cannot physically reach in the field.

The issue with the length of survey instrument arose due to the complexity of our conceptual framework. The survey instrument had to be revised several times to ensure that it was capturing essential information for all concepts under study while at the same time not becoming too long. In the end, the instrument contained 50 questions (mostly close-ended with an open-ended option) which is still considered lengthy for most surveys and this may have affected the response rate as well. To address this problem in our next round of data collection, we are exploring the option of splitting the instrument into two halves and then applying it to two separate but randomly selected groups of households. In a large sample study using the mail-in surveys, this method should yield the same quality of results while improving the response rate for the study. Additionally, we will follow up with reminder postcards which was not done for this short-term pilot study.

DEMOGRAPHIC PROFILE OF SURVEY RESPONDENTS

Factors such as age of occupants, income, racial profile, education status, and car ownership speak to the physical and social mobility of a household, of its specific recovery needs, and of its capacity to recover

from disaster. A majority of surveyed households were of primarily Caucasian descent (83%), were homeowners (91%) and had at least one member with some college level education (83%). Average household size was 2.8 persons per household.

About 70% of survey respondents said they were married and described their households as having two or more adults with (65%) or without minor children (65%) indicating elderly households or households with adult children. Overall, 26% households reported having children under the age of 18 years and 35% had members greater than 65 years of age. 87% reported household income of greater than $30,000 a year and 74% greater than $50,000 a year. Most had also lived in The Rockaways for 10 or more year possibly influencing their place attachment to The Rockaways.

The survey sample was representative of the population of The Rockaways in terms of household age composition and household size, but not representative in terms of racial composition, homeownership or annual household income, by which measures respondents were significantly more likely to be white, own their homes, and make well above the median income. This may be partly explained by our inability to survey public housing complexes and partly by the possibility that minority and renter populations were more stressed by recovery process and unable to find the time to respond. For future surveys, more efforts will have to be made to approach these households either through a different mechanism of data collection (such as mail-in surveys and follow-up reminders) or increasing the time period of data collection.

FINDINGS

Relocation Decision

Given the degree of damage inflicted on the Rockaways, we expected to find a high percentage of residents who planned to leave the area. Even though 9 months had passed between the storm and our survey, many homes are still uninhabitable, many services and amenities have not returned or returned incompletely, and there is a constant conversation in the press and among local policymakers about how to prepare the Rockaways and other neighborhoods for what is widely expected to be another Sandy-like storm in the future. Yet, 83% of survey respondents planned to stay in the area, 13% were undecided, and only 4% planned to relocate. Of those undecided, unsettled insurance claims, unsettled governmental relief claims, tenuous job stability and family disagreements were cited as reasons for indecision.

This modest number of respondents planning to leave the Rockaways is borne out in interviews. All five interview subjects planned to stay in the Rockaways, though none discounted the possibility of leaving if damaging storms persist or increase. However, the commitment to stay in the Rockaways seems widespread. A *New York Post* headline in April of 2013 read "Rockaways' real estate storms back" citing a local restaurateur who recently purchased a half-million dollar vacation home in the Rockaways despite its damaged condition (Keil, 2013). Beaches have been full this summer, old businesses continue to reopen and new businesses are opening. In July, for instance, a new luxury hotel called The Playland opened on Rockaway Beach Boulevard quickly drawing people from across the city to its restaurant, guest rooms and weekend dance parties.

Based on observations and interviews, a spirit of rootedness and resiliency seems widespread in the Rockaways. All five interview subjects claimed that they were committed to staying in the Rockaways, though at least one homeowner seemed to suggest that this decision was as much due to an inability to sell his home for a profit as any sense of dedication to the neighborhood. Another interview subject stated that not only was she, a new resident at the time of Sandy who was displaced for weeks, committed to staying, but that many of her friends from other neighborhoods are currently looking for permanent

housing opportunities in the neighborhood, having first learned about its existence from press coverage of the hurricane and becoming enamored of the waterfront locale as well as the camaraderie and resilient attitude of its residents. This dynamic suggests that, perhaps, we will need to revise our working hypotheses and research questions for subsequent research in other neighborhoods in order to more pointedly capture the attributes of residents who choose to stay in, or relocate to, storm-damaged neighborhoods.

Social Recovery Capacity

A household's social capacity refers to its ability to transform social assets such as sense of community, social networks, and family support to expedite its decision processes. Civil society relationships often substitute for official relief and rehabilitation aid and can help mobilize communities to obtain extra-local resources or to raise accountability of extra-local actors (Nakagawa & Shaw, 2004; Shaw & Goda, 2004; Prater, Peacock, Arlikatti, & Grover, 2006). Higher levels of trust and an increased presence of individual and community networks within neighborhoods have been associated with speedy and more satisfactory recovery outcomes (Nakagawa & Shaw, 2004). In contrast, households whose social networks have been severed due to involuntary and scattered displacement are less likely to be satisfied with resettlement outcomes (Iuchi, 2010). Our study supports this literature to an extent: the survey found that households who intended to stay in place had greater levels of neighborhood-level civic interaction and community engagement, and greater trust in neighborhood-level entities than those households that wished to relocate or that were undecided on the matter. This was true both before and after the disaster.

Next, we asked households to rate their frequency (on an increasing, five-point scale) of pre- and post-disaster interaction with different civic groups and organizations. These groups and organizations ranged from the neighborhood to national level. The survey found that most residents had higher levels of interaction with neighbors and locally-based family and friends than with local and extra-local groups and organizations both before and after the disaster (Figures S-1 and S-2). In general, the levels of interaction with the different types of groups and organizations had remained unchanged since the disaster, though there was a marginal increase in interaction with extra-local organization such as New York City agencies and federal agencies such as the Federal Housing & Urban Development (HUD) and the Federal Small Business Administration (SBA). The largest increase in interaction was reported in the case of Federal Emergency Management Agency (FEMA) which is not surprising given that much of disaster relief and recovery aid is channeled through FEMA for many months after a disaster. Interview subjects, likewise, tended to report the use of personal networks for support much more than official agencies, with most reporting little to no interaction with these entities. Churches, neighbors, family, and the Rockaway Surf Club and other *ad hoc* actors, such as the "the soup ladies" who gave away free soup that they delivered via bicycle, were cited as important resources in the recovery process. Though one interview subject suggested that many of the small-scale, do-it-yourself assistance activities were merely "symbolic" he nonetheless felt that in aggregate they were important maintaining an overall sense of community and optimism in the aftermath of the storm.

The survey also found that households staying in place more often cited civic interaction as "frequent" or "very frequent" than the relocating or undecided households for all categories of organizations. This was particularly so for neighbors, and neighborhood-based family and friends (see Figure 3). This finding implies that staying households maintained these close relations over the course of recovery and could possibly explain their decision to stay in place. In our in-depth interviews, some residents also stated that remaining in touch their neighbors, friends and family within The Rockaways was important consideration in their decision to stay or relocate. Perhaps because of its relatively isolated and somewhat unique context, community ties in the Rockaways seem very deep, with subjects consistently rating their

neighbors and a sense of community among the main reasons they want to stay in the Rockaways instead of relocate.

To capture the level of active household engagement in the community, we asked households to rate on an increasing five point scale how frequently they played leadership roles in community, actively participated in community events such as neighborhood festivals or community theaters, attended community events, undertook voluntary work in The Rockaways or nearby communities before and after the disaster, or participated in any other community activities. Pre-and post-disaster community engagement was generally low for most households though a few households did report an increase in attendance at community events. This is consistent with literature that indicates a higher level of information seeking on the part of disaster-affected households after an event. Between households intending to stay and those intending to relocate or those undecided, once again more households in the former category reported higher levels of community engagement than those in the latter two. None of the relocating or undecided households reported a high level of community engagement in any activity either before or after the disaster whereas 15% of staying in place households reported that they had frequently or very frequently engaged in at least one of the activities before the disaster and 16% reported having done so since.

The findings on civic interaction and engagement are reflected in the findings on social assistance received by households, on sources of information about reconstruction activity, and on the levels of trust in various civic groups and organizations. Over 60% of the surveyed households reported having received assistance in some form (financial, material, service or other) from their neighbors or neighborhood-based friends and family before the disaster. Of these, all households reported that this social assistance had either stayed the same or improved since the disaster. Neighbors, family and friends were also reported as being most frequent sources for information on reconstruction activity (70% of households), followed by local media (48%) and neighborhood associations and community groups (30%).

Households were asked to rate their trust in various civic groups and organizations on an increasing, four-point scale, including an option to indicate if they were unaware of that group or organization. Survey found that most households reported high levels of trust in neighborhood-based family and friends and their neighbors, followed by local faith-based organizations and neighborhood organizations before the disaster (see Figure 5). Levels of trust also increased following the disaster for most neighborhood, city and state level organizations (Figure 6). The increase in trust was most significant for neighbors, the local community boards and neighborhood based organizations. In contrast, most households reported that their trust in federal agencies such as FEMA and HUD, and in the New York Office of Emergency Management had decreased since the disaster. Very few households reporting being unaware of civic groups either before or after the disaster and the lack of awareness was linked mostly to neighborhood residents associations or to state and federal level entities. Between households that intend to stay in place and those that plan to relocate or are undecided, more of the former category reported higher levels of trust than those in the latter (Figure 7).

Interview subjects tended to view official entities overall as well-meaning but relatively ineffectual. FEMA “did what they could” and the city’s efforts were “fine, but I’m not surprised they didn’t do more.” Two of the five interview subjects suggested that, if there were any “heroes” among official response entities, they would be the workers of the New York City Department of Sanitation (DSNY), who worked diligently to clear debris and truck away garbage generated by residents gutting their homes. Also notably, among the survey respondents, 3 of 23 respondents (13%) used open-ended questions to vilify one particular entity – the American Red Cross. Comments included “horrible,” “should be arrested for fraud,” “the worst,” and “never saw them till several weeks after the flood except for photo ops”.

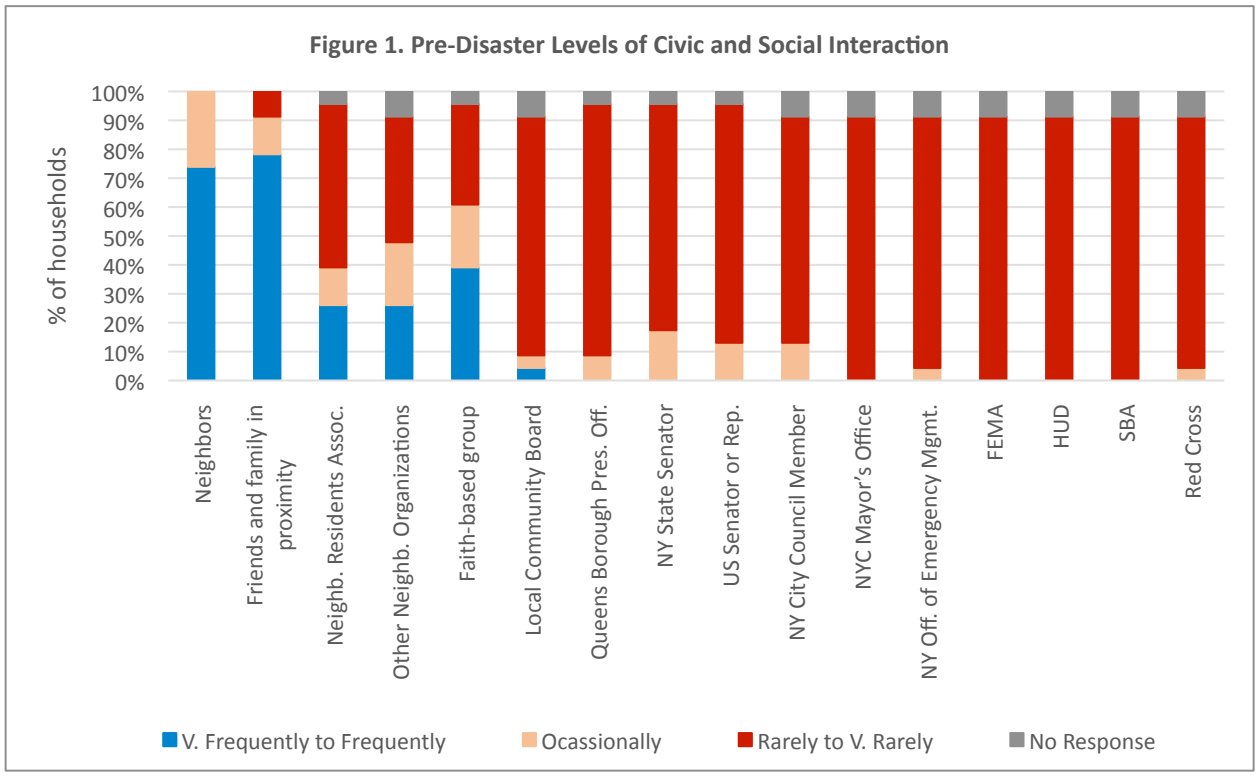
Figure 1. Pre-Disaster Levels of Civic and Social Interaction
% of households
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Neighbors
Friends and family in proximity
Neighb. Residents Assoc.
Other Neighb. Organizations
Faith-based group
Local Community Board
Queens Borough Pres. Off.
NY State Senator
US Senator or Rep.
NY City Council Member
NYC Mayor's Office
NY Off. of Emergency Mgmt.
FEMA
HUD
SBA
Red Cross
V. Frequently to Frequently
Ocassionally
Rarely to V. Rarely
No Response

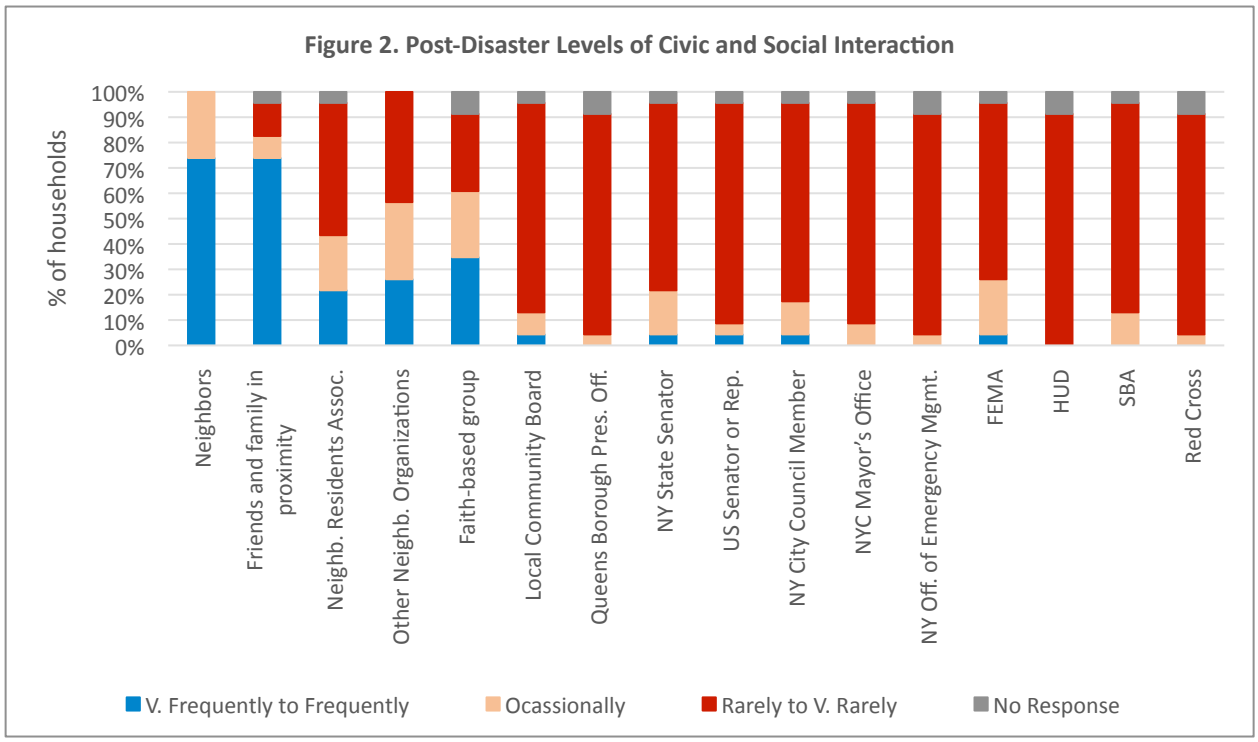
Figure 2. Post-Disaster Levels of Civic and Social Interaction
% of households
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Neighbors
Friends and family in proximity
Neighb. Residents Assoc.
Other Neighb. Organizations
Faith-based group
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US Senator or Rep.
NY City Council Member
NYC Mayor's Office
NY Off. of Emergency Mgmt.
FEMA
HUD
SBA
Red Cross
V. Frequently to Frequently
Ocassionally
Rarely to V. Rarely
No Response

Figure 3. Pre-and Post-Disaster Levels of Household Community Engagement

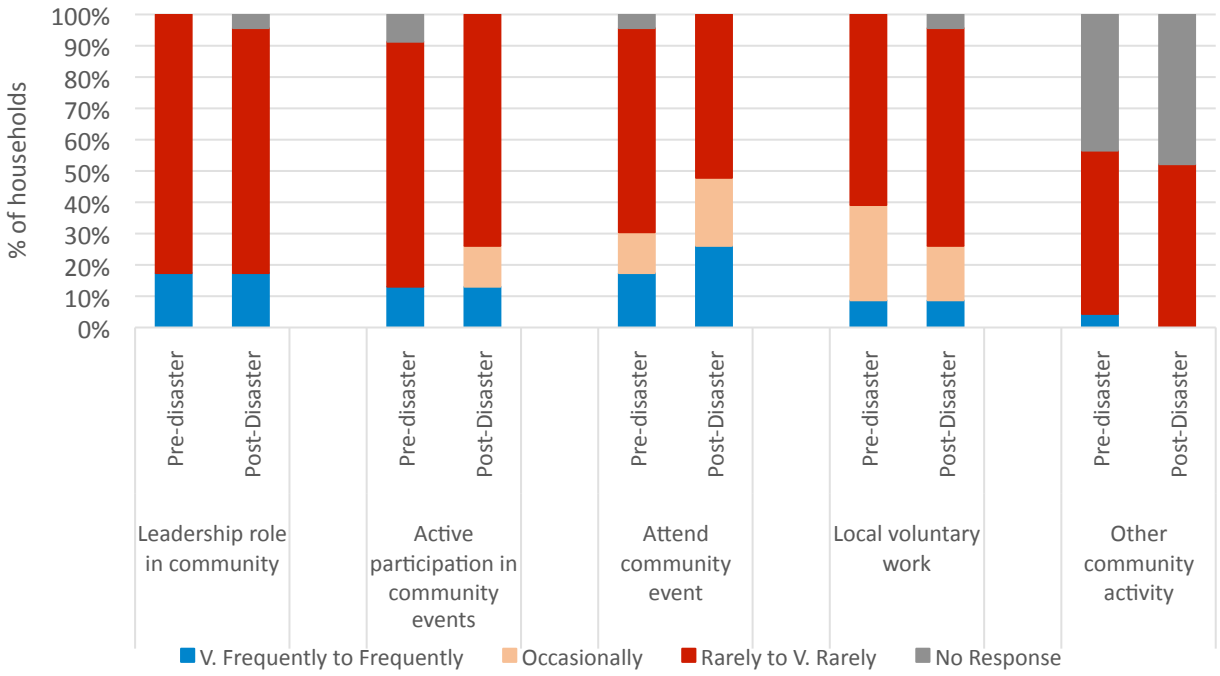


Figure 4. Percentage of households reporting high rate of civic and social interaction

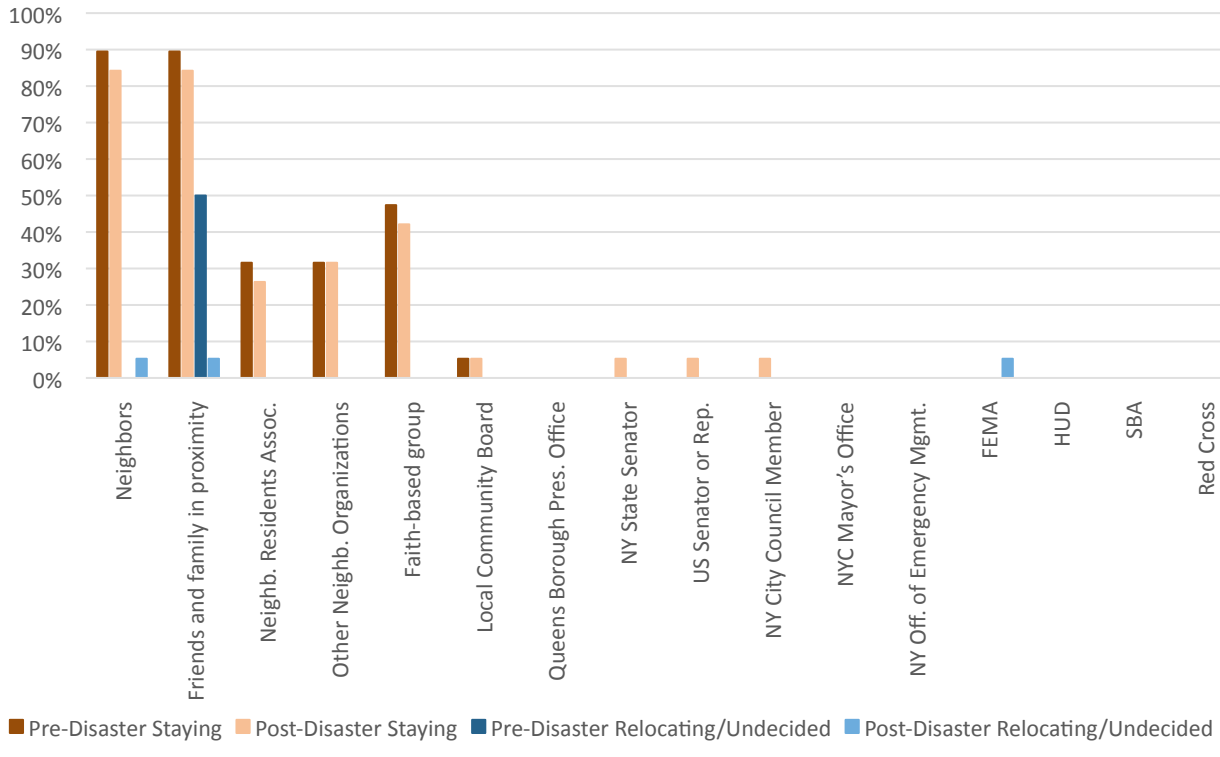


Figure 5. Pre-Disaster Trust in Local and Extra-local Groups

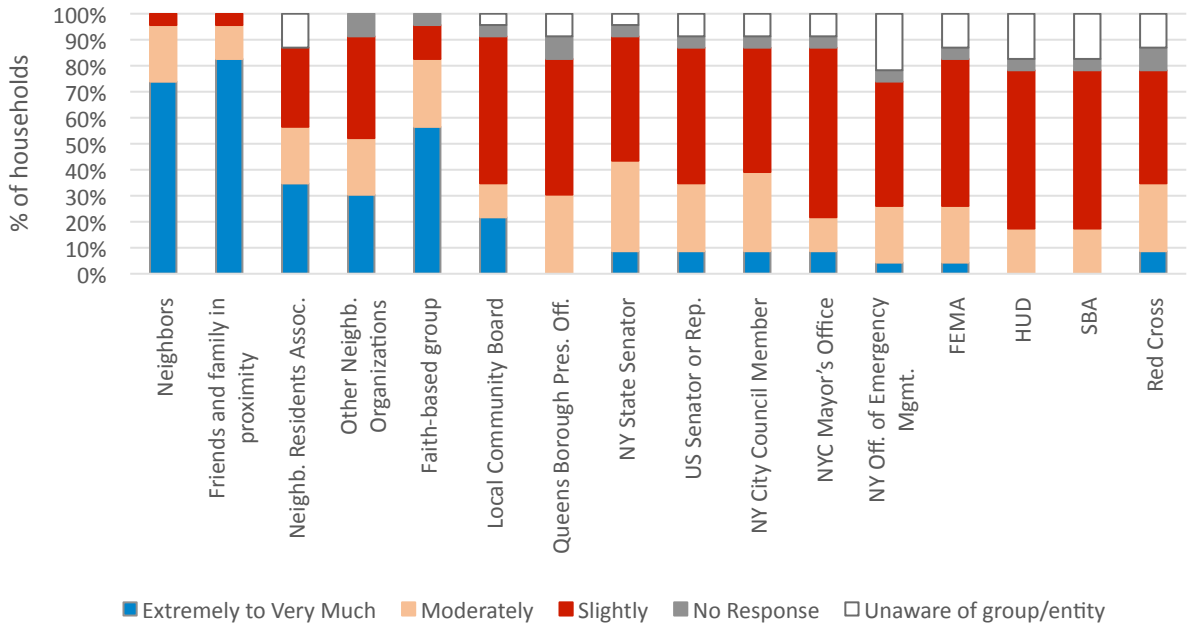
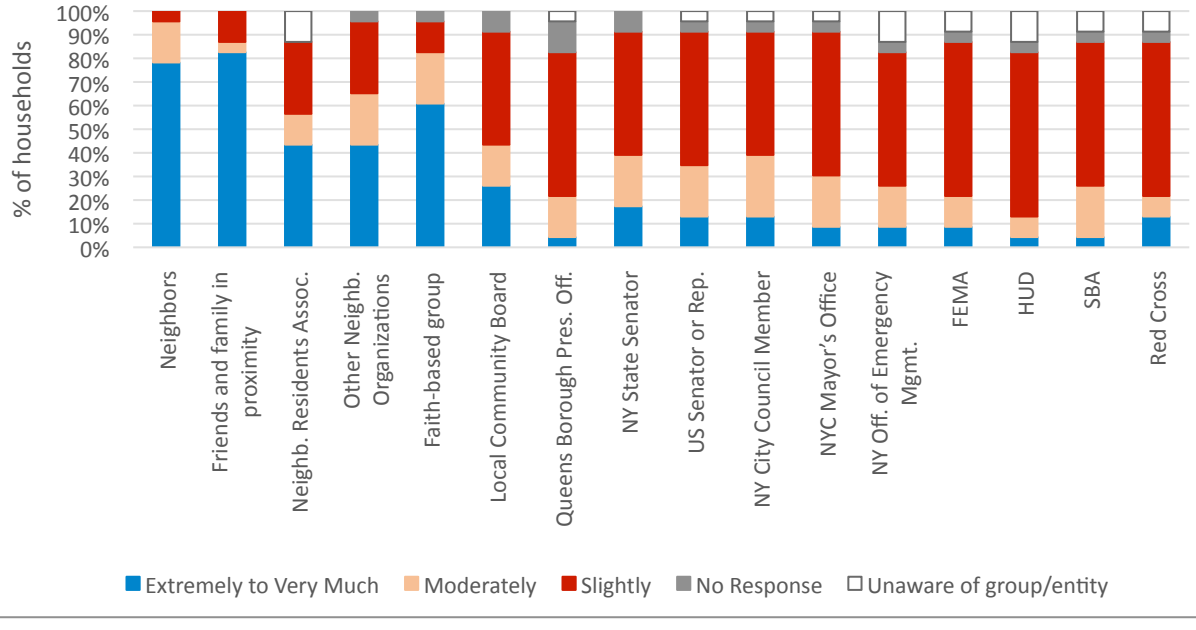
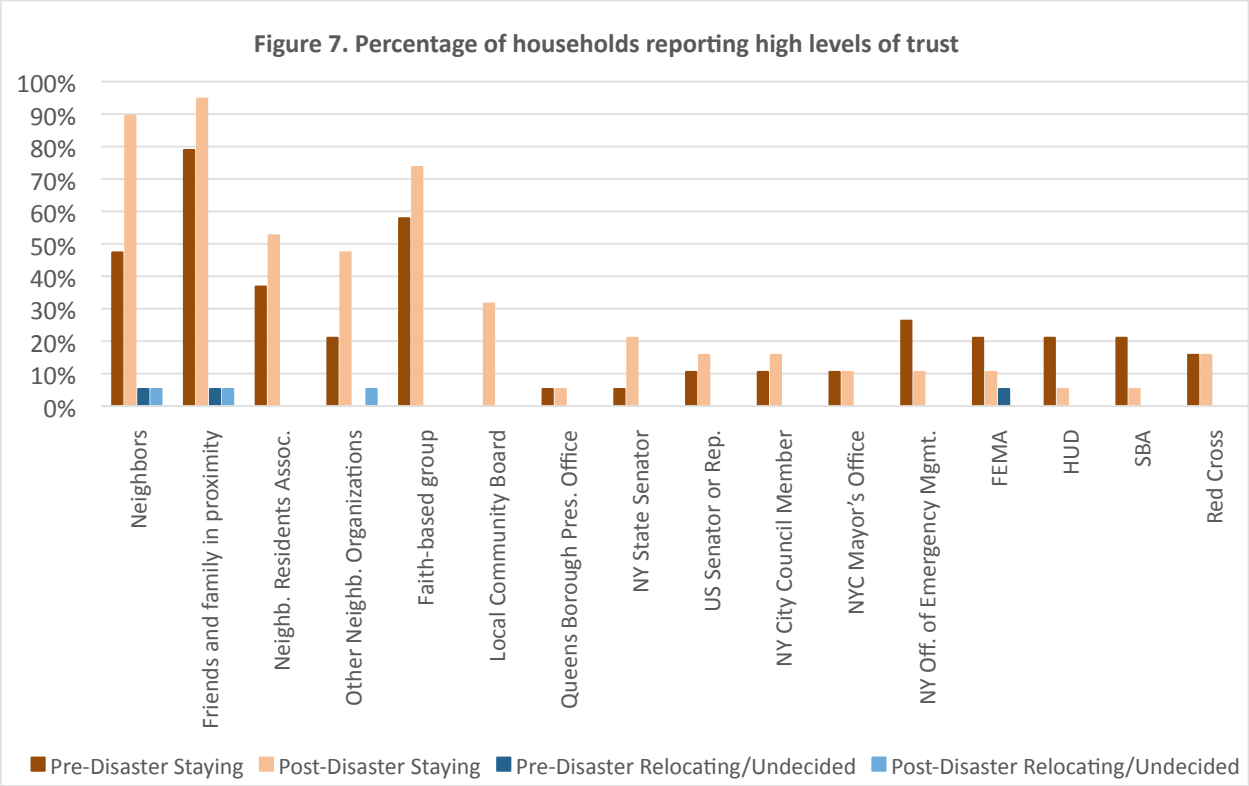


Figure 6. Post-Disaster Trust in Local and Extra-local Groups



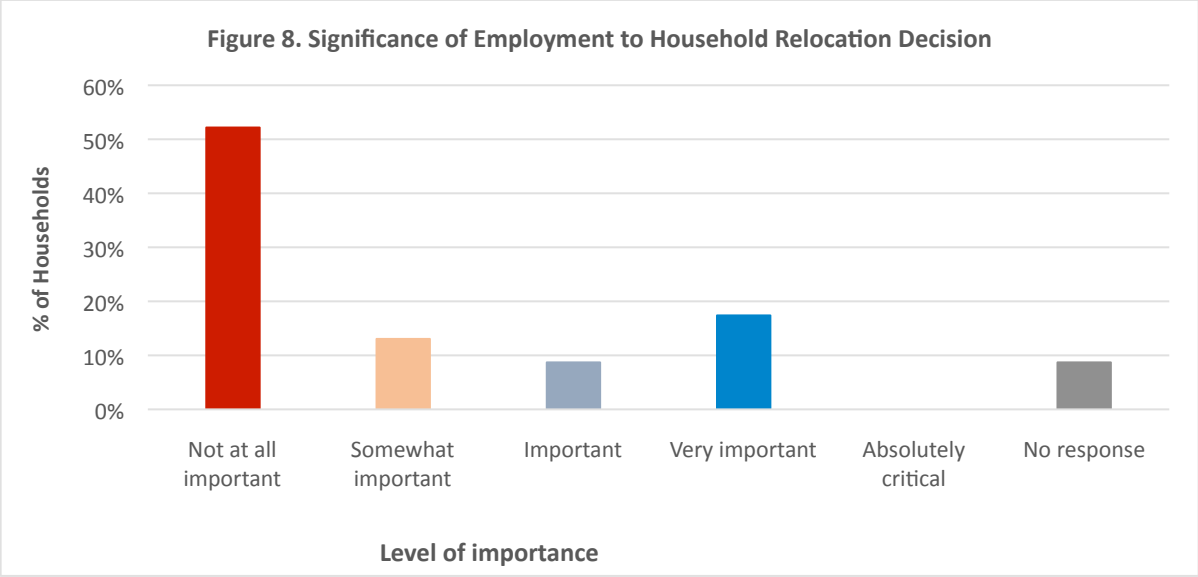


Economic Recovery Capacity

A household's economic capacity refers to its ability to find and sustain employment, livelihood and earnings. *Economic* capacity of a household depends on characteristics such as age, gender, wealth, education and livelihood profile. Elderly- and women-headed, low income, immigrant, and racial and ethnic minority households are less likely to recover their livelihoods and employment after a disaster owing to pre-existing economic inequalities, lack of educational achievement and literacy competence (Morrow, 1999; Tierney, 2006). Delays in restoration of livelihoods (Nakabayashi, 1990) and the lack of diversified livelihood skill (Hunter & David, 2011) can increase propensity for post-disaster relocation, and are in turn related to a household's physical distance to markets, woman-headed status, wealth, and education (Little, Smith, Cellarius, Coppock, & Barrett, 2001). Our initial thesis was that economic factors would be critical contributors to a respondents' decision to stay in or leave the Rockaways. Given the small sample and relative affluence of respondents compared to Rockaways residents generally, it is difficult to determine how significant these factors were overall but some specific observations are noteworthy.

It was anticipated that employment status, and the impact of Sandy on employment, would be a critical determining factor in household decisions to stay or move. The importance of employment on decisions to stay in place or relocate was self-reported to be a relatively unimportant aspect of the decision-making process. Over half (52%) of respondents said that employment as "not at all important" in these decisions, 13% reported them "somewhat important," 9% "important," and 17% "very important." None of the respondents rated it as "absolutely critical" (see Figure 8). Similarly, job or income loss did not appear to

significantly affect respondents' plans to stay in the Rockaways, as 61% of respondents reported job or income loss as a result of the storm and yet 83% still planned to stay. Of the three respondents who did plan to move, however, two (66%) reported income loss due to the storm.



There are a few potential explanations for this. Two respondents were retired at the time of Sandy, and based on answers to other questions on the survey we suspect that others may have also been retired, in which case job loss would not be a determining factor in any relocation decisions. It is also possible that in such a large city, and in a neighborhood where almost everyone commutes to work in other parts of the city, job loss would not be a relocation driver, as workers would simply look for another job within the region instead of relocating.

As reported above, survey respondents were relatively more affluent than the average Rockaways resident on many economic capacity measures, which likely also influenced the high percentage of residents who intended to stay in the area. For instance, while only 35% of Rockaways residents own their homes according to the 2010 US Census, 91% of survey respondents were homeowners. A total of 87% had homeowners insurance and 57% had flood insurance. However, although 83% of respondents received insurance compensation after the storm and 44% received some kind of government assistance, 78% of respondents rated compensation as not adequate for their needs.

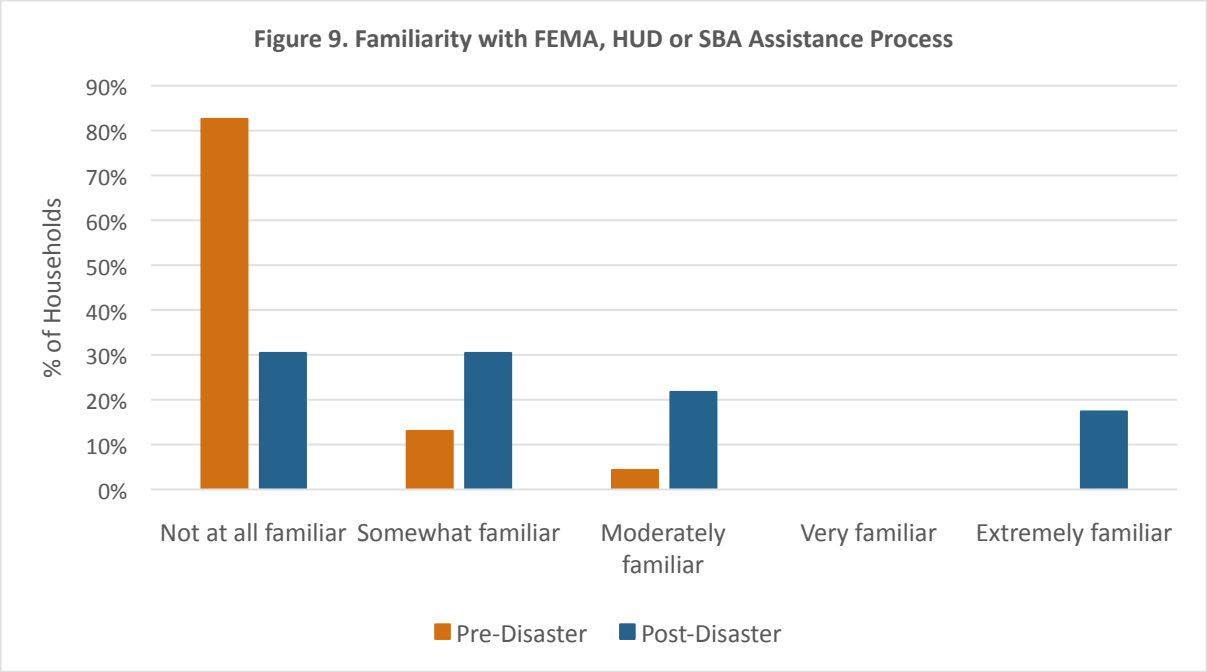
Among interview subjects, one issue related to economic capacity emerged in four of the five interviews, with subjects noting that they tended to under-utilize short term aid programs such as the many soup kitchens and recovery centers that were established in the neighborhood after the storm. Those with the ability to do so, because of financial means or social networks, left the Rockaways in the immediate aftermath and those who stayed or returned soon after tended not to access these kinds of short-term aid, stating that they were designed to help "people who really needed it, like those poor people in Far Rockaway." Three of the five interview subjects also reported using their own funds to pay for post-storm repairs, including both renters and owners. The two owners of standalone homes (i.e. not condominiums in large buildings) were much more resigned to the fact that, due to the level of damage and new building codes put in place since the storm, they would be spending significant amounts of their own money to rebuild. Thus, it appears that, despite the enormous amount of formal and informal aid available to Rockaways residents, survey respondents and interview subjects tended to rely on their own resources

first, followed by their existing social networks, ad hoc aid programs, and, finally, formal governmental and NGO-funded programs.

Institutional Knowledge Capacity

A household's *institutional capacity* refers to its ability to obtain aid and support from multi-sector organizations such as local, state and federal government, and private and nonprofit organizations. Demographic, social and political factors, certainly, mediate this interaction. Racial and ethnic minorities are often discriminated against during aid distribution while the politically connected tend to be favored (Aldrich, 2011). Immigrant households face additional barriers owing to language and cultural differences, as do women-headed and elderly households whose existing vulnerabilities are sometimes further exacerbated as a result of inadequate aid (Fothergill, Maestas, & Darlington, 1999). Questions about institutional capacity were designed to investigate these hypotheses and attempt to understand whether certain groups were better able to access aid than others. However, given the findings reported in the previous section, wherein in appears that our respondents tended to under-utilize existing programs by choice, we will revisit these hypotheses in the next round of surveying. Again, the small sample and somewhat homogenous sample also presents some challenges to making broad generalizations from the available data.

Based on survey questions designed to measure institutional capacity, we found that 74% of respondents had no prior experience living through a disaster and 87% had no previous experience applying for post-disaster government assistance (See Figure 9). Despite the widespread damage caused by Sandy, though, these numbers only increased modestly. Only 17% of respondents report now being "Extremely familiar" with the FEMA, HUD or SBA assistance process, no households reported being "very" familiar, 22% reported being "moderately" familiar, 30% "somewhat" familiar, and 30% remain "not at all familiar" with these processes. This low number may be somewhat explained by the dynamic reported in the previous section, with residents appearing to under-utilize existing aid by choice. Or it may point to other challenges, such as a lack of adequate publicity or technical assistance available to residents.



While New York City has created a number of programs to help residents affected by Sandy, including the NYC Build it Back program (Photo 1) that provides monetary relief and dedicated caseworkers to help residents navigate federal, state and local programs, insurance claims, contractor hiring and code compliance, the city has struggled to get residents to sign up for the program. Understanding the ways in which information about recovery programs is disseminated is important in understanding how aid programs like Build it Back can be most effectively delivered to communities. Based on our survey responses, in the Rockaways, word of mouth from neighbors, family and friends (87% of respondents) and neighborhood associations and community groups (30% of respondents) were the most common ways that information was acquired, while 13% of respondents claimed not to be aware of any assistance programs.

Photo 1: The Rockaways' NYC Build it Back assistance center (photo by D. Finn).

Interview subjects were more evenly divided, with three of the subjects noting that they obtained most of their information about aid programs and recovery status from the news media, the internet and service providers directly, rather than through word of mouth. Interview subjects also tended to report that government assistance (both technical and monetary) was adequate (though private insurance was roundly criticized for its unresponsiveness to storm victims' needs). These responses seem to differ from survey results, and more socio-demographic data will need to be collected to better understand this seeming disparity; we will address this issue in the refinement of our data collection methods for subsequent surveys and interviews.

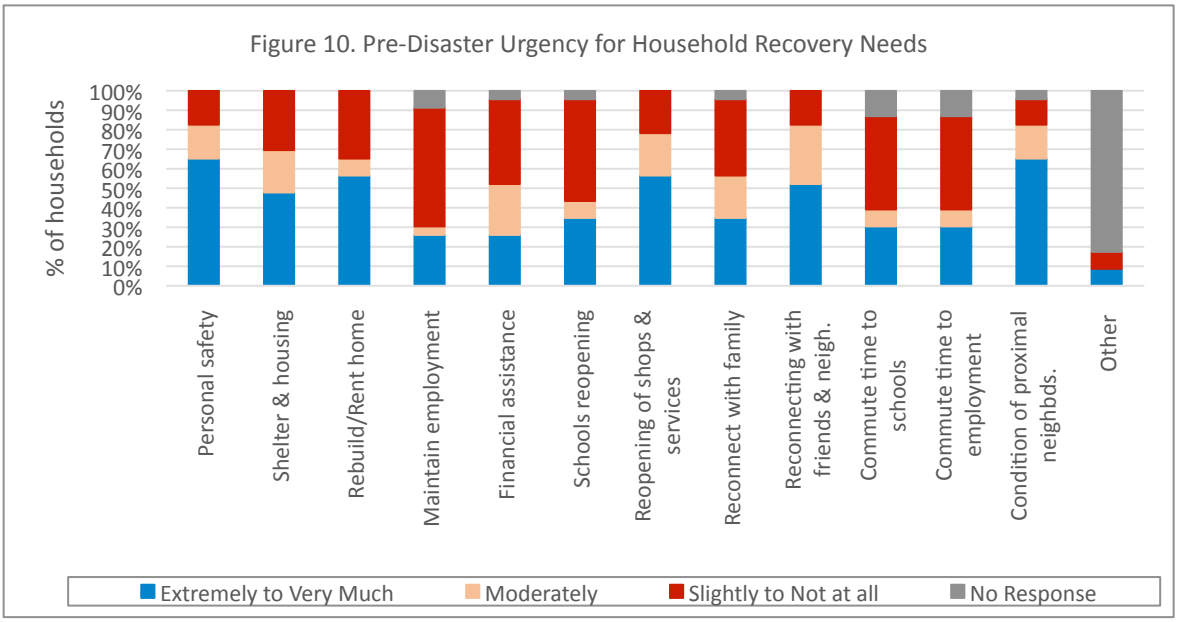
Urgency for Action

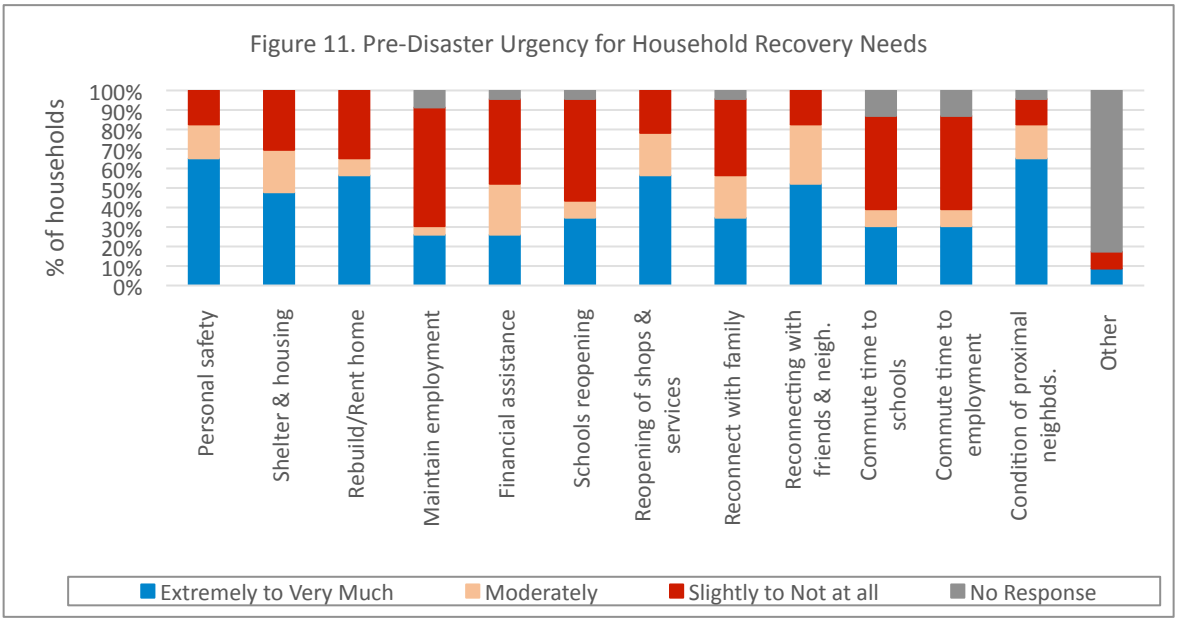
A household's recovery may be affected by its sense of urgency, defined as its constant reprioritization of needs ('what first?') and its desired timeliness of action ('how soon?') (Mitchell, Agle, & Wood, 1997). This change in time and needs priorities can greatly influence a household's decision behavior during recovery. This is seen most clearly in cases where coastal residents who agree to relocate inland immediately after a disaster are sometimes found to be increasingly dissatisfied with their decision after the fact. While in some cases this is owing to the poor planning of the relocation sites, in others it is because of reprioritization of the household's needs (e.g. from safety to livelihood) over time (Chandrasekhar, 2012a). Despite indications of its significance however, the role of sense of urgency is one of the least studied dimensions of household recovery. To measure urgency for this study, we asked

respondents to rate their level of concern on a five-point, increasing scale for various recovery needs ranging from short-term needs such as personal safety to intermediate and longer-term needs such as reopening of schools, shops and services. The respondents were asked to rate these concerns for just immediately after the disaster and then again at present. This way we aimed to measure both the substantive and the time-related nature of urgency for action.

The findings on urgency are less conclusive than the other three factors, but that may be due to the short time period of data collection and the demographic bias in the sample. Despite this, the survey does support literature by demonstrating that urgency of action does evolve over time. The survey found a marked level of difference in household urgency across all categories of recovery needs between immediate and at present time periods, but was not able to reveal as much about differences between different categories. All categories of recovery needs saw a drop in priority from the immediate aftermath to present time (see Figures 10 and 11). The largest drop was reported for personal safety: 65% of households gave high priority to personal in the immediate aftermath and whereas only 26% rated it similarly for the present time. The second highest difference was reported for recovery condition of proximal neighborhoods, with 65% households giving it a high rating in the immediate aftermath and only 35% rating it high now. The reopening of schools and maintaining employment were given low priority by over 50% of households in the immediate aftermath (such as schools reopening) and remained low priority even for the present (70% and 87%, respectively). This finding probably reflects the limitations due to the small size and the demographic bias in the sample since most of the survey respondents were older, middle-income households with lower dependence on schools and more job stability. It is possible that a bigger sample size and use of mail-in survey (as expected in next stage of data collection) will address this sample bias.

The survey was less revealing on the difference in immediate and current urgency within categories or between households wishing to relocate and those wishing to stay in place. These findings do not support literature on shifting of urgency from one recovery to need to another over time and on urgency influencing relocation decisions. This too however, may be a limitation of the study owing to the short time period of data collection. At the time of data collection (in June of 2013), households were still negotiating recovery and reconstruction aid from insurance companies and federal agencies. It was also the same as time as when New York City released recovery plans for the disaster affected areas. It is possible yet that household decisions on relocation and recovery as the outcomes of aid and reconstruction programs are determined and as the implementation of recovery plans begin. It is hoped that this limitation too will be addressed by the three-year long, large sample study to follow.





CONCLUSIONS

A popular T-Shirt being sold on the Rockaway Beach boardwalk since Sandy and now common around New York City states "Zone A: Rockaway Beach" on the front. Zone A was, at the time of Sandy, New York City's label for neighborhoods under mandatory evacuation orders; the "A" in Zone A on the shirt is rendered in the same style as the New York City Transit Authority's styled A Train logo (the line serving the Rockaways). The back of the shirt reads "Staying and Praying'" (Photo 2). Residents of the Rockaways, or, at least, those of certain demographic groups who participated in our study appear committed to staying in the neighborhood. This pilot study has helped illuminate some of the important dynamics that we will attempt to investigate further in subsequent research such as how and why such an attitude has come to exist and what the implications are for disaster preparation, response and recovery. It

has also helped raise a number of interesting hypotheses to be tested in our upcoming large sample study. For instance, which of the four (economic, social, institutional or urgency) factors best determines household relocation decision outcomes? Are certain factors stronger for households that wish to relocate versus those that wish to stay in place? Do relocation decisions change over time and how is this change related to a household's economic, social, institutional capacity and urgency for action? And lastly, this pilot study has also been invaluable in pointing out limitations of our existing research methods, which must be refined prior to launching a larger and more geographically broad study.

Photo 2: A popular t-shirt being sold on the Rockaway Beach boardwalk (photo by D. Finn).

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