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# Returning home after Superstorm Sandy: phases in the return-entry process

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## Abstract
Despite current advances in research related to return-entry process following disasters, the need to understand this process from the perspective of the returnees remains. This exploratory study examines the return-entry experience of residents returning home after Superstorm Sandy. Specifically, this study aims to identify patterns in the return experiences of residents following the ending of the evacuation order and gain insight into the temporal dimensions of the activities and decisions made following disasters. A series of six focus groups were conducted with 28 participants from communities in Ocean County and Monmouth County, New Jersey. A qualitative grounded theory approach of focus group transcripts revealed three different phases: (1) initiation and planning, (2) traveling home, and (3) arriving home. Understanding the actions and perspectives of returnees within each phase provides greater insight into the experiences of returnees during this critical time in the early disaster recovery process.

**Keywords** Return-entry · Superstorm Sandy · Recovery · Return phases · New Jersey

## 1 Introduction

Ending an evacuation and returning to one's home and community after a disaster is a complex process entailing various steps and activities. While the identification of phases inherent in the evacuation process has garnered significant attention in the disaster literature, defining the phases by which homeowners return home for the first time after disasters has

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received far less consideration. As evident in previous research, returning home after a disaster can be a challenging and dangerous experience for residents, as they may encounter assorted secondary hazards posed by damaged or destroyed structures, delayed restoration of utilities, and transportation issues due to debris in roadways (Siebeneck et al. 2013). Often, homeowners face questions that influence their return process: Is reentry safe for all household members? Will services and resources be readily available upon return? Will families be able to remain in their homes permanently after initially returning? Where and when will information about the return strategy be available? What hazards pose safety risks to returnees? Recent studies offer insight into return decisions; however, research examining evacuees' experiences from the point they decide to return to their first arrival home is underdeveloped.

This paper aims to identify and describe phases of the disaster return-entry process for New Jersey homeowners following Superstorm Sandy in 2012. Residents' experiences and perspectives of their return-entry process were collected through a series of focus group discussions. A grounded theory approach (Charmaz 2006) was employed to elicit distinct return themes and actions from the focus group transcripts. Based on this analysis, three phases within the return-entry process are described, with particular attention given to common homeowner activities and experiences during each phase. Not only do the findings reveal the iterative nature of the return-entry process, but they also allude to linkages between the initial return-entry process for homeowners and long-term recovery outcomes.

## 2 Background

### 2.1 Evacuation: the outbound movement

The movement of individuals in response to hazards is often an out-and-back process (Siebeneck and Cova 2012), and despite most evacuations ending with the return of residents (Allenby and Fink 2005), little is known about the steps by which evacuees return to their homes and communities after a disaster. The evacuation portion of the cycle has been extensively studied, and as early as the 1960s, research identified different steps within the evacuation process. This process typically involves three phases: warning, confirmation, and the evacuation movement (Drabek 1969). During these phases, individuals successively receive the warning message, seek out other information or environmental cues to confirm the message, and make various decisions related to evacuating the threatened area (Hasan et al. 2013). Similarly, four actions are distinctive of the evacuation process: decision, notification, preparation, and response (Urbanik et al. 1980). The first two actions are undertaken by emergency management officials or local authorities (e.g., mayors, judges) when deciding to issue an evacuation and communicating the warning to citizens. The third and fourth evacuation actions include the warned population readying themselves to evacuate and then physically leaving the hazard zone.

The third action of evacuation process is when the most critical household decisions are made (Urbanik et al. 1980). Within the preparation phase, households receive the warning, assess and confirm the risks, select the most appropriate protective action, determine their destination and route, and gather items they will take with them while evacuating (Cova and Johnson 2002; Lindell et al. 2011; Mesa-Arango et al. 2013; Sadri et al. 2013). Models, such as the protective action decision model (Lindell and Perry 2012), provide insights into the interrelationships between factors that influence evacuation decisions. As

noted in this model and in other studies, individuals often consider multiple factors such as perceived personal impacts of the hazard, the natural and physical characteristics of the hazards (e.g., speed of onset, intensity, geographic impact), the source and quality of the warning information networks, and potential obstacles that may hinder a safe evacuation (Lindell et al. 2005; Cova et al. 2009; Huang et al. 2012; Sadri et al. 2017). The characteristics of warning messages are also important in the evacuation decision process, as upon receiving and confirming the message, residents must understand the instructions, determine whether the message is credible, and ultimately decide to carry out the recommended protective action (Drabek 1999; Lindell and Perry 2003). Socio-demographic factors such as gender (Bateman and Edwards 2002), age (Fernandez et al. 2002), economic status (Masozera et al. 2007), and the presence of physical or mental disabilities (Peek and Stough 2010) can significantly contribute to evacuation intentions and one's ability to carry out the evacuation.

Households may also face uncertainties when deciding to leave. These uncertainties can stem from variables including the nature of the hazard, its potential magnitude and geographic extent, and the households' perceived ability to evacuate and find a suitable destination (Lindell and Prater 2007b; Sadri et al. 2013). Additionally, uncertainty often exists in the forecasting of hazardous events as well as in the warning itself, leading individuals to make decisions despite experiencing uncertainty about the nature and extent of the risks (Morss et al. 2010).

The time it takes to physically leave—the third phase (evacuation movement) in Drabek (1969)'s framework and the fourth action (response) in Urbanik et al.'s (1980) model—often depends on the availability of routes, number of exits in a community, traffic volume, average number of cars evacuating per household, departure times relative to other evacuees, and evacuation distance (Cova and Johnson 2002; Lindell and Prater 2007a). Access to public transportation and evacuation assistance also effects the ability and timing of an individual to evacuate (Litman 2006). An evacuee's movement out of the hazardous zone and subsequent arrival at the evacuation destination concludes the evacuation process in many research studies. However, in most evacuations, this is only the first of two trips, as evacuees often undergo a return trip home once the disaster subsides (Allenby and Fink 2005).

## 2.2 Return-entry: the movement home

Return-entry begins when evacuation orders are lifted and residents are permitted to return home following a disaster (Stallings 1991). Regardless of whether residents are able to return and remain at their home permanently, or if they are required to re-evacuate as the result of a look-and-leave plan, this first trip home initiates the recovery process for residents (Siebeneck and Cova 2012). Therefore, actions undertaken during return entry have consequences throughout short-term and long-term recovery. Despite such high stakes, the phases inherent to the return-entry process are not well described in the disaster literature.

Recent studies examine how dimensions of risk perception, communication, and socio-demographic characteristics influence the decision of when to return home. Research suggests that residents' perceptions about the extent of hazard risk vary throughout the evacuation and return-entry process and that during the return phase, higher perceptions of risk increase returnee's compliance with official return-entry plans (Siebeneck and Cova 2012). Similarly, in a study examining re-entry following Hurricane Ike (2008), Siebeneck et al. (2013) found that returnees who perceived returning as riskier were more likely to comply

with the official return-entry plans for their communities than returnees who perceived returning as less risky. Dash and Morrow (2000) investigated perceptions among populations who did not evacuate for Hurricane Georges (1998); they found that as anticipation of extended traffic delays during the return phase increased, evacuation intentions for future events decreased.

During the return-entry process, evacuees consult a variety information sources, such as local authorities, local and national news media, and family and peers, when making return-related decisions (Lin et al. 2014). Likewise, emergency managers often distribute the official return-entry messages using a variety of channels to reach the maximum number of evacuees. This is often challenging as evacuees may be dispersed across a large geographic area and may have limited access to electricity, Internet, and cellular reception after a disaster (Manandhar and Siebeneck 2018). Receiving official return messages is important, since residents are less likely to return early if they are aware of their community's return plan (Siebeneck and Cova 2014).

Finally, socio-demographic characteristics of evacuated households also influence the return-entry movement. For example, some households, particularly those with young children, may utilize a "return scout" technique for the initial visit (Siebeneck and Cova 2012). In these cases, adult members of the family return home first to determine whether bringing children or elderly relatives' home is safe. Following Hurricane Rita in 2005, females were more likely than males to comply with the return-entry plans for their areas, and that as an individual's level of attained education increased, so did their likelihood of complying with return-entry orders (Siebeneck and Cova 2008). While these studies highlight the role socio-demographic characteristics have in return timing, less is known about how these characteristics influence safe and successful returns.

## 2.3 Restoration: the move toward recovery

Recovery is the period after the disaster in which individuals and communities undertake actions aimed at repairing, rebuilding, and bringing a community back to pre-event conditions (Kates et al. 2006). Acknowledging that return is a necessary first step to recovery, another group of return-related studies focuses on restoration. Restoration occurs during the recovery process after the emergency has ended, but before large-scale reconstruction commences (Kates and Pijawka 1977). It is a time period beyond the initial return that includes the long-term decision to permanently return and rebuild. During restoration, residents patch up homes, repair damage, and reestablish relatively normal social and economic routines. Appropriate indicators of restoration might include reestablished utility services, functioning transportation systems, or the return of residents (Kates et al. 2006).

Studies examining restoration frequently use a single dependent variable, such as total population or occupied housing units, to represent aggregate household "return and recovery" together (cf. Finch et al. 2010; Li et al. 2010). Most empirical "return and recovery" studies demonstrate that socio-demographic characteristics, damage levels, or a combination of the two, influence observed patterns in residential return. For example, following Hurricane Katrina, Groen and Polivka (2010) found that retirees were more likely to permanently return and rebuild, whereas Black residents and lower income households were less likely to permanently return to their pre-Katrina addresses. Similarly, another study after Hurricane Katrina found that, when controlling for income and damage, the Black population that permanently returned following Katrina did so at a slower rate compared to other racial groups (Fussell et al. 2010), such as the Vietnamese community (Li et al.

2010). These observed differences were attributed to higher levels of social capital in the Vietnamese community, such as trust and resource sharing, which compensated for their relatively low household incomes (Leong et al. 2007; Airriess et al. 2008). Furthermore, Xiao and Van Zandt (2012) demonstrate interdependency between the return of businesses and the return of residents to Galveston following Hurricane Ike, even after controlling for socio-demographics and damage levels. This result suggests that other decisions and processes at the community level (e.g., restoration of utilities, resumption of public services) likely influence residents' return processes.

Conflating return and recovery, then, may obscure the potentially elaborate series of steps residents undertake to return home for good. As suggested by Kates et al. (2006), the return of residents often occurs during the restoration phase and whether households fully recover is not realized until later in the reconstruction process. Quarantelli (1995) notes, for example, that households often undergo multiple relocations between evacuating and attaining permanent housing, often moving between temporary shelters and temporary housing arrangements. Hence, the move toward permanent housing, whether it is returning home or relocating permanently elsewhere, is not always linear. Moreover, individual and household vulnerability characteristics strongly influence these return pathways and their timelines.

These studies clarify that, while household return precedes and is integral to recovery, the two processes are not synonymous. As such, they should be considered independently. In many cases, the return process initiates the recovery process for households. This study aims to extend knowledge of the return movement of evacuees by defining phases within the return-entry process and suggests linkages exist between return decisions and longer-term recovery outcomes.

# 3 Methodology

## 3.1 Superstorm Sandy

Superstorm Sandy was a post-tropical cyclone that made landfall near Brigantine, New Jersey, on October 29, 2012. Upon landfall, the National Weather Service reported maximum wind gusts of approximately 75 miles per hour and storm surge heights of 4.9–5.5 feet along the Atlantic, Ocean, and Monmouth County shorelines (NOAA 2013). Superstorm Sandy currently ranks as the fourth costliest hurricane in US history, resulting in $72.2 billion in damage (NOAA 2018), with almost $37 billion sustained in New Jersey (State of New Jersey 2017). Seventy-two fatalities in the USA were attributed to Sandy (NOAA 2013) and an estimated 880,000 residents in New Jersey evacuated ahead of the storm (Kulkarni et al. 2017). In the aftermath, displaced residents sought to return to their homes and communities. For many residents from barrier island and waterfront communities, the devastation caused by Sandy's storm surge, inland flooding, and high winds made their return challenging.

## 3.2 Data collection

In May 2017, the research team traveled to New Jersey and conducted six focus groups with 28 participants over a 3-day period. As shown in Fig. 1, two focus groups were conducted at each of three locations in Seaside Heights (Ocean County), Manahawkin (Ocean
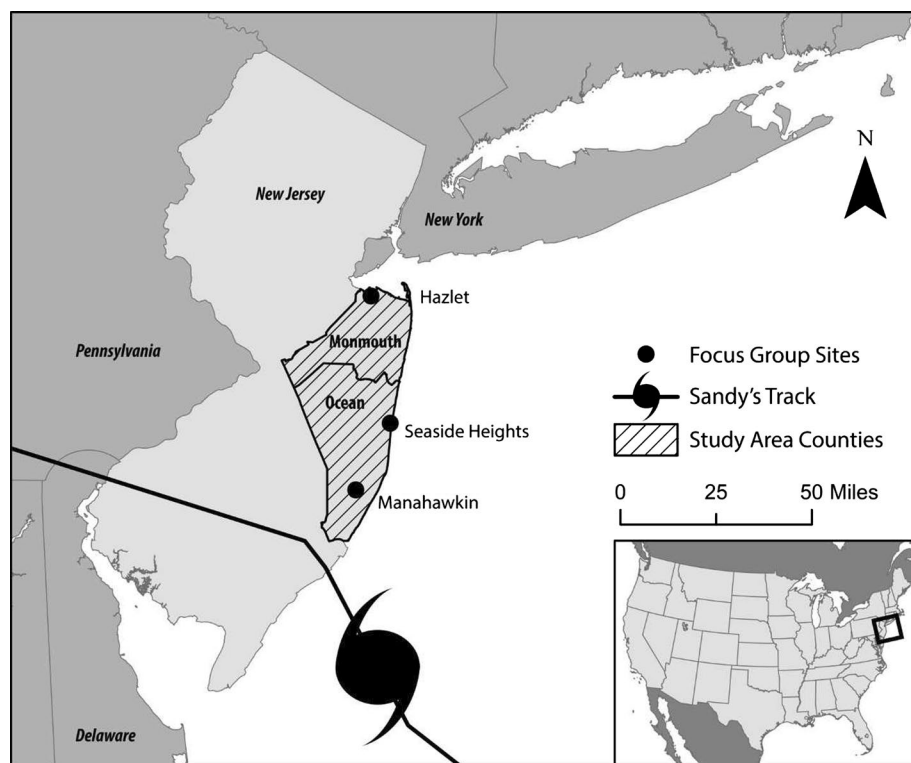
**Fig. 1** Map of communities

County), and Hazlet (Monmouth County). Participants were recruited from surrounding communities situated on barrier islands, in the coastal marshes, and on the mainland. Contacts from a local branch of the Salvation Army and Ocean County's Long-Term Recovery Groups assisted in participant recruitment and provided facilities for the team to conduct the focus groups. Participants were adult homeowners in Ocean or Monmouth Counties whose homes sustained damage during Hurricane Sandy and who had reached out to one or both of these organizations for assistance following the storm.

Each focus group session lasted approximately 2 hours. Through a series of open-ended questions, participants described their return-entry and recovery experiences, how the storm affected their households and communities, and the factors they felt either hindered or helped their household during the return-entry and long-term recovery processes. At the end of the interviews, participants were asked to fill out a questionnaire about their previous disaster experiences and demographic information. The focus groups were audio recorded and transcribed.

Table 1 compares demographic characteristics of participants to the study area population. The sample included homeowners who were primarily middle-aged, Caucasian, and female. Approximately half of the participants had attended college or attained a two-year degree and almost two-thirds of participants reported annual household incomes between $30,000 and $59,000 (35.7%) or $60,000 and $99,000 (32.1%). Participant demographics were similar to the 2016 American Community Survey Estimates (US Census 2016a, b)

**Table 1** Census estimates for Ocean and Monmouth Counties, New Jersey

| Demographic | Monmouth County | Ocean County | Focus groups |
|---|---|---|---|
| Median age (years) | 43 | 42.8 | 62.5 |
| Race/ethnicity: White, non-Hispanic (%) | 75 | 85 | 96.4 |
| Gender: female (%) | 51 | 52 | 75 |
| Some college/2-year degree (%) | 24 | 29 | 46.6 |
| Median annual household income | $90,226 | $62,223 | – |
| Owner-occupied households (%) | 72 | 78.4 | 100 |

for Ocean and Monmouth counties, except that the sample contained higher proportions of females, individuals with some college or vocational schooling, and older individuals.

# 4 Analysis

The research team employed a grounded theory approach to analyze the data (Charmaz 2006). This systematic method to generate new insights into a particular social phenomenon is applied frequently in qualitative analyses of focus group data (Glaser and Strauss 1999). Grounded theory is commonly used to identify themes and patterns in human responses to hazards as well as to distill respondents' descriptions of their disaster-related experiences (Phillips 2014; Choi et al. 2018). In the post-disaster context, this method has been useful in identifying patterns and processes throughout short-term and long-term disaster recovery and has allowed for richer context and new insights into the various social, spatial, and temporal dimensions of post-disaster recovery (Richardson 2005; Cox and Perry 2011). Grounded theory's inductive approach also permits the identification of patterns in the data unencumbered by a priori theoretical assumptions, which is appropriate considering the underdeveloped nature of return-entry literature. The first step in analysis was initial coding, in which each line of the transcript was reviewed and assigned a descriptive code based on its content. This formed the basis for a comparative analysis between the various codes and themes that emerged from review of the participant's responses. The second step consisted of focused coding, whereby the identified themes and subthemes were applied to the transcribed responses (Eisenman et al. 2007). Lastly, representative quotes were selected from the transcripts to highlight major themes from participants' return-entry descriptions. The next section presents results from the analysis and offers insights into patterns observed in the return experiences of New Jersey residents.

# 5 Results

Data analysis yielded both a temporal dimension to the return-entry process and a set of prevalent themes for each time period (Fig. 2). As generated from the grounded theory approach, the return-entry experiences of residents can be divided into three phases: (1) initiation and planning, (2) return movement, and (3) arriving home. Within each of these time periods, focused coding yielded subthemes within each of these phases that detailed common experiences shared by the participants. The first phase, initiation and planning,
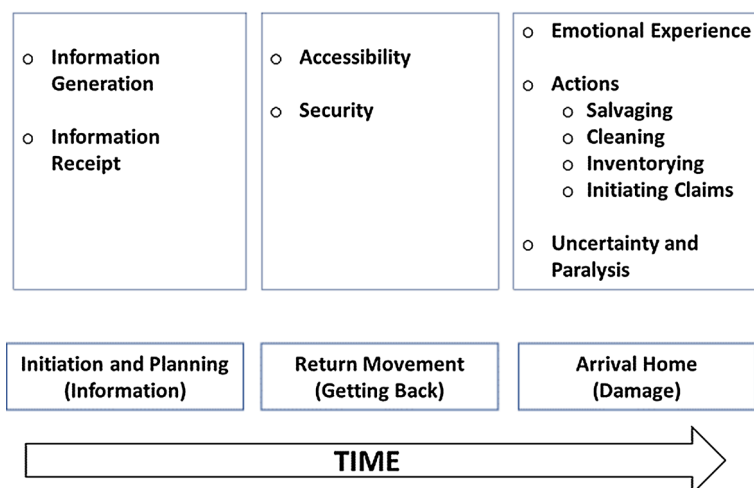
## Defining the Return Phases



| Information Generation · Information Receipt | Accessibility · Security | Emotional Experience · Actions · Salvaging · Cleaning · Inventorying · Initiating Claims · Uncertainty and Paralysis |
|---|---|---|
| **Initiation and Planning (Information)** | **Return Movement (Getting Back)** | **Arrival Home (Damage)** |

**TIME** →

**Fig. 2** Phases of the return-entry process emergent in focus group data

includes evacuee information gathering about the status of their home and community, as well as formation of a plan to return to their home. Common activities during this first phase include seeking out information about the extent of the damage, timing of the return, and available routes to get back home. The second phase involves the actual movement of evacuees' home. This phase includes the physical movement homeward and any activity that facilitates this movement. The third phase includes arriving home to one's property for the first time since the disaster and the actions residents undertake upon this initial arrival. The following sections describe emergent themes from each stage of the return-entry process.

### 5.1 Return initiation and planning phase

The first phase of the return-entry process, initiation and planning, entails the activities evacuees undertake in preparation to return home following the disaster. While located at their evacuation destinations, residents often began making plans for returning to their homes and communities. As a prerequisite, displaced households needed to gather a variety of information to aid in their decision of when and how to initially return home. However, one of the greatest sources of frustration for evacuees in these early days following Superstorm Sandy was the lack of information. Analysis of the data yielded two themes related to information access prior to returning home: (1) information generation and (2) information receipt.

Information generation refers to the availability of information, or lack thereof, in the aftermath of Superstorm Sandy. Evacuees had trouble finding damage and return-related information for their homes and communities. Whether a return plan existed was often irrelevant if it was inaccessible. In some resident's perspectives, it appeared as though the information had never been generated. Anxiety from lack of information led residents to line up in person at various checkpoints and at other entrances to their communities in

hopes of learning when and where they could enter. As two participants from different barrier island communities lamented:

> … I think that was probably one of the biggest problems. There was no information, was no communication, and [in] my estimation I don't think that there was a solid plan in place.—Meredith, Hazlet Group 2

> The very first week when we all didn't know where we were to go and what we should do. And you're just standing in line waiting to just see who you can talk to about whatever you could try to do.—Brenda, Seaside Heights Group 1

Gathering information from afar proved difficult for many evacuees. They needed status updates on their homes and information on when they would be allowed back to inspect their property. In some cases, no information existed about the status of specific houses or neighborhoods because some areas were so heavily impacted and were unsafe for community officials and news media to access them:

> They couldn't even get the news crew in the town, and [with] the additional problems of the leakage of the gas […] they just did not want anybody in there… [this] was approximately […] a month [after].—Judith, Hazlet Group 1

The second theme that emerged in this phase was information receipt. In contrast to information generation, which centers on message availability, information receipt pertains to channels for information transmission and the resources that either enabled or constrained message delivery to evacuated households. Several residents described the large-scale power outages that occurred in the aftermath of the storm. These outages made it difficult for residents to access information via cellular phones, the Internet, or through local television networks.

> Interviewer: "So were cell phones working?"
> Meredith: "No! If you had a plug to use you could charge it… if you could find a place to charge it. […] I mean you had to ask and if you were lucky enough to have to see a television… you didn't know." (Hazlet Group 2)

> …you couldn't see anything on television. There was no electricity, there was nothing…like I said very post-apocalyptic.—Julia, Hazlet Group 1

In several cases, participants described meeting at various gathering points and using face-to-face communication as their primary means of information receipt in the early days after the storm. Several communities had designated gathering points for evacuees to meet and receive information about the community's return-entry strategy. Locations of gathering points included recreational centers, businesses with large parking lots, or local government offices. While at these locations, evacuees received information from local officials as well as from neighbors who had already successfully accessed the impacted areas:

> Some of them had already gotten to their houses, because different areas were let in at different times. My particular street – the street that my street is off of– didn't let us in until […] three o'clock… I think they had told us originally that we could go back at noon-ish, no one [was there], and then when we got to Twin Lakes we had to wait in the Rec Center parking lot and it seemed like a couple of hours. They said that there were wires down. We were getting information from people that had gone in or some from people that had stayed, so that's where I was getting it.—Loretta, Manahawkin Group 1

Importantly, some participants did have access to the Internet and their phones during the Initiation and Planning phase and therefore were able to receive information about the status of their homes and communities. Participants with access to these communication conduits noted that they successfully procured information about their communities, as well as planned the first steps they needed to take in their recovery process:

> Julia: "Yes! The internet was working!"
> Shauna: "Verizon did a great job."
> Julia: "We were able to have Internet access you know, Facebook access, and telephone access. You know, that was the only good thing.—Hazlet Group 1

> I called the morning after [the storm] Tuesday… I called homeowners insurance, flood insurance, FEMA, and car insurance. And I made the phone calls to the agencies and everything. Luckily a lot of things are electronic now so you can have access to them on the web.—Shauna, Hazlet Group 1

The ability to access information prior to returning home was critical because, as the following sections illustrate, these returnees were more prepared to take the actions necessary to safely access their properties and promptly initiate the home recovery process. This had implications on how quickly households were able to initiate and navigate the short-term and long-term recovery processes.

## 5.2 Return movement phase

The second phase of the return-entry process involves the actual movement of evacuees back home. Two primary themes emerged from returnee experiences during this phase: (1) accessibility and (2) security. The first theme, accessibility, refers to any agent that facilitated or hindered travel or entrance into the impacted area. Because the homes and communities of most study participants sustained significant damage, these participants had to contend with numerous secondary hazards on their trip home, such as downed power lines, gas leaks, and debris in the road. Widespread damage to infrastructure, coupled with a large population base eager to return, meant residents' initial return visits were often delayed for weeks after the storm. Furthermore, most were unable to remain in their homes permanently at that time due to the extensive damage. Many participants described how their community's official look-and-leave strategies facilitated their initial return trip home. These strategies involved returning home for a specified period of time under time constraints and then leaving the disaster-impacted area:

> It was almost a month or over a month before they even allowed anyone in and when they did allow anyone in they were escorted in ok on a scooter on a little golf cart, ok, they were given approximately 15 min to go into their house and pick something up and then they were out …—Donna, Hazlet Group 2

> …we would meet at a parking lot in Toms River, and busses would bring us over and drop us at the corner on the Highway and tell us we can walk to your house now, just make sure you meet us back here in an hour.—Heather, Seaside Heights Group 1

Commonly, local officials had residents gather at designated checkpoints prior to transporting them to their neighborhoods. Variations did exist in how long they were able to access their properties on the initial trip home. Some residents were dropped off by bus or van near their homes and told to walk back, while others were escorted through the streets of

their neighborhood in golf carts and other vehicles. In many cases, if entry into their homes was possible, residents had the opportunity to salvage some belongings and carry them out:

> …it was cold and it was damp, and we couldn't do anything there anyhow, but you do what you could, get some clothes if you needed it and then you come back on the bus…—Heather, Seaside Heights Group 1

> We had to go to the…VFW (Veterans of Foreign Wars) [Hall], and […] they bussed us in three weeks after [the storm]. And we could only bring one suitcase, and to take whatever we could take.—Carol, Seaside Heights Group 2

In several instances, participants accessed their properties prior to issuance of their community's formal return-entry plan. One resident returned home during the actual storm once the tide no longer posed an obstacle and before security checkpoints were established in his neighborhood:

> I actually came back before the storm was over because I could not sleep that night. I got up and came home. The tide had receded, so it was able to get through, navigate the debris, you know, saw the flood mark, the water line on the house and just like, oh man here we go.—Adam, Manahawkin Group 1

Security was the second theme identified in the return movement phase. In the early days following the storm, both residents and local officials became concerned about the security of neighborhoods. Fears of looting and worries about outsiders accessing damaged areas fueled these concerns. Subsequently, these trepidations impacted how people moved in and out of their neighborhoods during the return-entry process. As returnees described:

> Yeah we were checked before coming into town [because] they were afraid of looters and stuff like that, I can understand that.—Wendy, Hazlet Group 2

> You just couldn't come on the island and take what was not yours. So, they were very, I thought being very careful, the Army and the Navy, whoever they sent, the whole service people that were there…they were terrific.—Brenda, Seaside Heights Group 1

Some communities developed a system of identification cards that evacuated residents were issued and required to carry to access their home in the weeks following Superstorm Sandy:

> I mean literally, Fischer Boulevard, you couldn't even drive unless you were … police enforcement. There was not, no cars were allowed [on] Fischer at one point. […] [The security was] very high. You had to have ID at all times.—Gloria, Seaside Heights Group 1

> Rosemary: "They gave us a card…"
> Gloria: "It was this card that everybody in the household [used], so you can get back and forth on the street."—Seaside Heights Group 1

While in some cases respondents noted that security protocols delayed return to their homes, many were grateful that security measures were available to protect their homes after the storm. Additionally, participants noted that security checkpoints provided peace of mind that there were no individuals in the area who did not belong. In fact, security checkpoints and the use of identification cards were viewed by several participants as facilitators during the initial return-entry process:

It was a facilitator… security, ….—Carl, Seaside Heights Group 1

I felt safe with them for anybody coming in for sure.—Brenda, Seaside Heights Group 1

## 5.3 Arrival home phase

The third temporal dimension identified was the Arrival Phase. This final phase includes arriving at one's property for the first time after Superstorm Sandy, as well as the array of actions and reactions that residents confront upon their arrival. Within this phase, three themes emerged pertaining to the experiences of returnees: (1) emotional experience, (2) actions undertaken, and (3) uncertainty and paralysis. Notably, the themes were all direct responses to the extent of damage that participants encountered returning home. In terms of property damage, mold was one of the most common issues in homes that had flooded:

The house was way too unsafe. The mold had taken a hold instantly, but the time I was first allowed back in, which was about a week after the hurricane, mold was creeping up everywhere, you could see it. And […] it was obvious [we] had suffered quite a blow.—Jim, Seaside Heights Group 2

We had mold, sure, real quick. Which you would think, how would you get mold? Because we were there, and the next day we cleaned everything, but that mold started to grow.—Beth, Manahawkin Group 1

Along with mold, homeowners encountered other types of damage to their homes. Participants saw visible evidence of storm surge, inland flooding, and high winds. Homes showed varying degrees of structural damage, while contents in many homes were damaged or destroyed by floodwaters or rainwater. In some cases, debris from other nearby properties was washed into participants' homes and properties:

The house was destroyed. I mean like diesel fuel, poop, as you all know. And I was just done at that point. I didn't really think it through how […] sea life came over that wall.—Shauna, Hazlet Group 1

…and when we went into the house it just looked like she said, like a war zone. Everything was all over, muddy. Everything was just gorged, sludged, so we basically had to… go back and take all the wet stuff out.—Meredith, Hazlet Group 2

We knew we definitely couldn't move back home, our house has moved off the foundation, it was an unsafe structure.—Michelle, Manahawkin Group 2

Returnee's emotional experiences comprised the first theme identified during the arrival home phase. For residents with significantly damaged properties, seeing their damaged homes for the first time elicited feelings of disorientation, disbelief, and despair:

I could not walk, I would not, where I live [there is a major road] the next street over. I couldn't even go down that street and look, I felt so lost. I was able to gut and stay there, the people, the backs of their houses were torn out, and it's like, oh my God…—Beth, Manahawkin Group 1

I think by the time I could get down the street, I open the door, and I was really just in shock. The house was there, but you couldn't walk in.—Rita, Manahawkin Group 2

> My other daughter brought me up […] cuz [*sic*] they wanted me to see if there was anything we could salvage, but being that my side of the house was on the first floor… so there really wasn't too much to be salvaged at that point, but they wanted to see if there was, they made me go through. That was the worst thing I've ever done. But you do what you have to do.—Meredith, Manahawkin Group 2

As described in the previous quotes, returnees experienced various emotions including feeling overwhelmed from seeing the damage to their homes and neighborhoods, being shocked by the extent of damage, and sadness stemming from losing one's belongings. In one case, a participant expressed anger about sightseers driving through her neighborhood. She notes:

> It was like we were living in a fishbowl. They were driving down the streets and looking at you, […] I felt like screaming at these people, 'What the hell are you looking at?!' You know, be grateful that you are not staying here and dealing with this.—Beth, Manahawkin Group 1

The second theme involves actions undertaken. Upon returning home, individuals able to remain on their properties commenced a variety of actions to initiate their recovery process. Among our participants, there were individuals who were either not part of compulsory look-and-leave strategies or who chose to remain despite being instructed otherwise. Due to the extensive damage to many homes, gutting the home and removing the sheet rock were among the first steps many returnees undertook to prevent mold growth. Returnees also began salvaging any undamaged belongings and removing them from their homes:

> I was fortunate. We got it - the drywall - that same [week], that Thursday… we thought that mold would come first, and we were lucky that we didn't have mold.—Adam, Manahawkin Group 1

> I started packing up things, throwing things in the front […] and dealing with that.—Adam, Manahawkin Group 1

> I had gone into my house to see what we could salvage. It was the next day and the only things that we could salvage were […] sheets for the twin beds, like for my daughter's room, that were up in their closets, and board games, […] top shelf stuff. So we took all the board games and we brought them to the shelter because we figured at least the people in the shelter needed something to be able to do.—Michelle, Manahawkin Group 2

Additionally, many participants described undertaking actions to facilitate the insurance process. These actions included documenting damage caused by the storm, taking pictures of the damage, applying for individual assistance offered by FEMA, and contacting insurance providers initiate property assessments:

> I knew what to do. I knew about ripping out the sheetrock, the wet insulation, getting that stuff out. I knew about taking pictures of your stuff that's damaged for insurance purposes because we had a toilet break once. So, I kind of have some knowledge on what to do.—Frank, Manahawkin Group 2

> For some reason what I did – I don't know what made me do it – is I took pictures of everything in the house …and then when we came back we had movers so when they were taking it out I was taking pictures of it and writing in the quote

> what it was and what they took out, and that's how we had to keep record so we could send it to the insurance company plus the adjustments.—Meredith, Hazlet Group 2

> We knew we were in trouble. [We] immediately hired an engineer to come out to tell us if this was going to be okay to fix it or whatever. We needed to know for ourselves. And we called our insurance company immediately. We reached out to FEMA right away.—Michelle, Hazlet Group 2

As participants described, keeping records of what was damaged facilitated the reimbursement process when working with the insurance companies. However, not every participant knew what to do upon returning home.

Another theme that emerged during this phase was uncertainty about what actions needed upon returning home. In at least one case, this led to feelings of paralysis:

> I had to say geez, my big problem with that, I didn't know what to do. Both me and the wife said what do we do first? I wish the heck that they would have, the town, the state, the Fed would have held a little class, well make sure you do… this paperwork [*sic*] first and watch out for this kind of builder, and make sure they're certified, you know, give you a little bit of guidance of what to do first. We had no idea what a first step was, and there wasn't any help.—Ben, Manahawkin Group 2

While not knowing what to do was an issue for some participants, those familiar with the actions required were not always equipped with the necessary resources. Thus, limited resource availability also temporarily hindered residents' incipient recovery efforts. Resource needs identified by the participants varied individually. They included tangible resources, such as gas for transportation or dumpsters to hold debris and garbage; human resources to help with home gutting or debris removal; and critical utilities, such as electricity for heat and hot water for showering:

> …trying to get a dumpster. Talk about a barrier! Everybody needed a dumpster.—Adam, Manahawkin Group 1

> I had my son, who was in college… he took 2 weeks off from college, and we just started ripping everything out.—Adam, Manahawkin Group 1

> I couldn't get into the house to get my medication.—Meredith, Hazlet Group 2

> We couldn't get gas because they [gas stations] had no electricity […] If you were lucky, you had a friend living outside the flood area so you could shower.—Judith, Hazlet Group 1

> The utilities were coming back on, and we were very close to the water. They didn't turn the power back on for weeks. […] It was like they just forgot, and it felt like post-apocalyptic almost.—Judith, Hazlet Group 1

Despite lacking essential resources, some residents decided to remain in their severely damaged homes after initially returning. Several participants described not wanting to leave their properties unattended and felt that they could better manage the repair and rebuilding processes if they remained in their homes. In these instances, many went without water, gas, and electricity for an extended period. With winter quickly approaching, the following weeks and months were miserable for many returnees who opted to remain on their properties.

# 6 Discussion

Given that return marks a critical juncture in the initiation of household recovery, an improved understanding of the return-entry process is crucial for developing theory on both short-term and long-term disaster recovery. Leveraging the experiences, actions, and decisions of returnees following Sandy in a grounded theory methodology reveal insights into the temporal dimensions of the return process. Whereas returning home has traditionally been treated as a single point in the restoration phase of the recovery process (Kates et al. 2006), in-depth, inductive analysis of returnee experiences uncovers three phases in the return home: (1) the initiation and planning phase, (2) the return movement phase, and (3) the arrival home phase.

The process of generating and receiving information during return-entry mirrored information gathering during the evacuation process. Similar to households in the warning phase of evacuation (Huang et al. 2012), residents in the return-entry planning phase also seek information from various sources and channels. Access to information is a critical aspect of disaster response, and the ways in which multiple information sources are used in combination has become an important topic of investigation (Seeger et al. 2003). However, as indicated by New Jersey residents following Superstorm Sandy, the ability to communicate during return entry was more restricted than during evacuation. The well-known phenomenon of cascading failures in interdependent networks, such as those observed between a power network and an Internet network (Buldyrev et al. 2010), directly impacted community residents' experiences of information access. In many cases, participants had limited access to electricity after the storm, and widespread power outages lasted for days or weeks (Comes and Van de Walle 2014). Without electricity, it was difficult to charge cell phones (Manandhar and Siebeneck 2018) and access the Internet. Several residents noted that they were unable to watch television at their evacuation destinations, thereby increasing the difficulty of procuring location-specific information. As in many cases, displaced residents congregated at designated gathering places (Nelan and Schumann 2018) or at shelters and relied on face-to-face communication as their primary means of obtaining current information. The type and source of information individuals were able to access after this event disaster was greatly impacted by one's evacuation destination.

In the second phase, the return movement phase, local officials implemented community return-entry plans that constrained how and when residents got back to their neighborhoods and homes. It is important to mention that the relationship between initial return and permanent return can take varying forms. In some cases, the initial return movement leads to a permanent return because the damage sustained to homes and communities is low. In other cases, the initial return was the first of multiple trips to the property aimed at repairing or rebuilding one's home so they could remain there on a permanent basis. Based on their preliminary assessment (e.g., damage, availability of utilities, resources for repairs, etc.), some participants either decided to stay or leave depending on the condition of their home. Although the participants in our study were either back in their homes or working toward returning permanently, sometimes the initial return trip and/or subsequent return trip leads households to decide to relocate elsewhere permanently and not rebuild.

For most participants, the look-and-leave return plans specified several facets of their return trip, including the timing and duration of the return, permitted modes of transport for re-entry (e.g., bus, car, on foot), and security protocols to enter the most heavily damaged areas. In terms of timing, participants communicated that debris on roadways, downed powerlines, and other hazardous conditions made accessing their neighborhoods

perilous or altogether impossible. Some residents noted that delays in returning hindered their ability to prevent or address issues related to mold and other types of damage, thus creating a barrier to their eventual recovery. In terms of transport, parameters discussed by returnees differed markedly from those considered in studies about evacuees (Lindell and Prater 2007a). Whereas in evacuation, individuals' decisions regarding evacuation timing, mode of transportation, evacuation preparations (e.g., selection of destination, items taken with them, etc.), and route selection shape the outbound movement, the movement decisions of returnees, in this case, were fairly constrained by the return-entry strategies.

The final phase of the return-entry process, the arrival home, was the phase that participants spent the most time describing. Residents' encounters with damage illustrated three themes explained in the previous section: emotion, restorative actions, and uncertainty, at times to the point of paralysis. While previous qualitative research describes the emotions and sense-of-place that motivate return and relocation decisions (Cox and Perry 2011; Morrice 2013), this study documents the nature of emotions when first returning home. For study participants, not only was their initial return to damaged homes emotionally taxing, but it often proved a daunting experience, riddled with uncertainty. Many of our participants lost most of their belongings in the storm, and during the return they realized the disaster recovery process would be neither quick nor easy.

Participants described the various hazards they encountered upon arriving home. Issues of damage to the structure itself, such as homes being knocked off their foundations, the emergence and growth of mold, and the spilling of hazardous materials all posed health and safety risks to returnees. Many participants seemed surprised by these secondary hazards, and these sometimes proved more frustrating than the initiating hazard agents (i.e., storm surge, flooding, and wind). While initiating hazards subsided rapidly and naturally and were well understood, abating mold growth, toxic spills, and mud deposition proved to be chronic hazards that lasted for weeks or months afterward. These insights are important when considering the level of preparedness of returnees during this critical period of the return and early restoration process. Previous research demonstrates just as residents need to be prepared to carry out the evacuation process, they also need to be prepared to reenter their homes and communities after a disaster (Siebeneck et al. 2013). The participants' description of new and sometimes unexpected risks and hazards underscores the necessity of communication between local officials and returnees prior to re-entry. Unless returnees have the knowledge and tools to protect themselves from threats posed by secondary hazards, returning home could be a riskier undertaking for residents than they are prepared to handle.

Upon encountering new hazards and risks when returning home, participants described the earliest actions they undertook to initiate the restoration process. More labor-intensive than anticipated, these actions included removing sheet rock, drying out furniture and other household items, packing salvageable belongings, and discarding anything that could not be saved. While some participants indicated that they knew what to do upon returning home, others felt either overwhelmed or unprepared in taking the first steps. Many participants did not have the supplies or process knowledge necessary to confidently begin cleaning out homes and initiating the insurance claims process. Some participants emphasized the importance of taking photos of everything for insurance purposes and were adamant that this valuable advice be shared with others. For those without pictures as evidence of damage, receiving insurance money to replace their damaged belongings bordered on impossible.

Indeed, the third phase of the return-entry process is significant because the emotions and actions that must be rapidly undertaken have ramifications for eventual household

recovery. Residents' return and recovery experiences demonstrate that uncertainty and lack of preparedness to perform necessary actions can significantly delay household restoration. Ripple effects of return decisions also continue into long-term recovery. Most studies that focus on restoration or "return and recovery" discount the sheer emotion expended by returnees and the tremendous resources required in recovering a single damaged home. Each tally in a population count hides the many difficult steps residents must take to reoccupy their homes, including those during the return phase. The fact that residents in our study spent the most amount of time describing this third arrival home phase and that it generated the largest variety of themes indicates the taken-for-granted nature of the household restoration process.

# 7 Conclusion

This study provides new insight into the return-entry process undertaken by residents in the aftermath of Superstorm Sandy and identifies three distinct phases that residents experienced in the initial trip back home. Although previous research glosses over return entry, this study identifies it as a vital first step in post-disaster community restoration. Many extant studies treat the decision to return and rebuild as a single step; however, this study shows the inadequacy of such a simplification. Current findings demonstrate the value of considering return entry as a multistage process. They illustrate many barriers inherent to return entry that, if too daunting, could compel residents to throw in the proverbial towel and walk away. Any of these barriers is capable of derailing the eventual recovery of the household and larger community. Therefore, an improved understanding of return-entry phases can inform not only improved practices for managing evacuee return, but also strategies for preventing community-wide population loss, housing abandonment, and neighborhood checker boarding in long-term recovery.

Several practical implications emanate from this study. First, similar to the evacuation phase, clear communication is crucial for effectively managing the return-entry movement. While many residents were aware that plans existed for their communities, they expressed difficulty obtaining that information through electronic channels. Studies suggest that diversifying the channels through which evacuees receive information while displaced from their homes is key (Siebeneck and Cova 2014). Additionally, because evacuees' expectations related to returning home do not always align with reality (Siebeneck et al. 2013), communication efforts aimed at returnees should also focus on preparing them for what to expect when they initially return. By extension, ensuring that evacuees are aware of all credible and official channels for receiving return messages is equally important. The source of information is a key factor in message trust and credibility (Avery 2010) and the availability of accessible and trusted communication channels was critical especially when information was insufficient in the post-disaster situation (Sommerfeldt 2015). Second, many of the participants described the need for security in the days and weeks after Superstorm Sandy. Due to heightened anxiety stemming from news reports, and in some cases, actual experiences of looting on their properties, many residents were grateful for the added security. Knowledge that homes and belongings are secure during an evacuation may minimize the likelihood of residents returning home early to prevent looting. Third, many participants noted needing a variety of resources upon returning home. To address their needs and alleviate uncertainty during the return phase, local officials and relief organizations should consider

providing returnees with guidance about the actions they should undertake upon return-ing home. Informing returnees of tasks and vital resources prior to reentry would allow them to better prepare for activities such as mucking out the home, taking pictures for insurance purposes, and initiating the insurance claims process. Because returning to a devastated home is an emotional experience, the more information returnees have regarding how to reenter their homes safely and expedite the recovery process, the bet-ter. Ultimately, improved information and assistance to households in the return-entry period could circumvent adverse consequences in long-term recovery.

Several aspects of this study, including sample composition, study area demographics, and timing of data collection, could limit the transferability of findings to other return-entry contexts. First, since the majority of focus group participants were white, middle-aged, female homeowners, both gender and housing tenure may have influenced the nature of responses received. In households who sent ahead a male scout, female respondents may not have been able to contribute as much information about the early phases of return entry. Additionally, though men and women both reported experiencing strong emotions upon arriving home, women in our sample generally articulated these emotions to a greater degree. In terms of housing tenure, our sample contained no renters; therefore, we do not know how the return process may have differed for them. Second, the communities we sampled are not very diverse in terms of economic status and ethnicity. The middle to high average income of the study area (by national standards) may have minimized barriers dur-ing the return movement, as our sample had access to personal transportation. Further-more, apart from the high ratio of construction material costs to insurance payouts, money was not mentioned as an obstacle to initially returning. Though the focus groups gener-ally reflect the demographic characteristics of their respective communities, future studies should explore the extent to which higher degrees of community diversity produce diver-gent household experiences in the return-entry process. Finally, because the focus groups were conducted nearly 5 years after the initial return, there may be issues with recollection bias due to participants' ability to potentially recall specific details about their return pro-cess. Moreover, impediments to long-term recovery posed by ongoing post-disaster law-suits at the time of data collection prompted angry responses from participants. Due to their immediacy, these stressful events likely overshadowed residents' discussion of expe-riences related to the return-entry process. Despite these potential issues in recall of the return-entry process, research suggests that narrative rehearsal of one's disaster experience may reduce deterioration of memory over time (Neisser et al. 1996). Therefore, recruitment from long-term recovery groups where participants' post-disaster narratives were being actively shared may have limited the degree of memory loss in the present study.

This study provides insight into experiences of households during the return-entry pro-cess following Superstorm Sandy. While much was learned about the actions undertaken in the days and weeks following the storm, much remains to be learned about this criti-cal period during the recovery process. Future research should examine whether the return phases presented in this study can be applied across other natural and technological haz-ards. Because damage type differs by hazard agent, more insight is needed to understand the risks to which residents are exposed upon returning home. Additionally, it is impor-tant to understand how resident demographics and household composition influence deci-sions and actions undertaken during the return-entry process. Not every household will have access to the same resources or face the same barriers in return entry. More insight is needed to understand how socio-demographic factors and previous disaster experience intersect to facilitate or impede the return process and how the sequence of decisions that people make on their initial return impacts their permanent return.

# References

Airriess CA, Li W, Leong KJ, Chen ACC, Keith VM (2008) Church-based social capital, networks and geographical scale: Katrina evacuation, relocation, and recovery in a New Orleans Vietnamese American community. Geoforum 39:1333–1346

Allenby B, Fink J (2005) Toward inherently secure and resilient societies. Science 309:1034–1036

Avery EJ (2010) Contextual and audience moderators of channel selection and message reception of public health information in routine and crisis situations. J Public Relat Res 22:378–403

Bateman JM, Edwards B (2002) Gender and evacuation: a closer look at why women are more likely to evacuate for hurricanes. Nat Hazard Rev 3(3):107–117

Buldyrev SV, Parshani R, Paul G, Stanley HE, Havlin S (2010) Catastrophic cascade of failures in interdependent networks. Nature 464:1025

Charmaz K (2006) Constructing grounded theory: a practical guide through qualitative analysis. Sage, London

Choi YJ, Choi HB, O'Donnell M (2018) Disaster reintegration model: a qualitative analysis on developing Korean disaster mental health support model. Int J Environ Res Public Health 15(2):362

Comes T, Van de Walle B (2014) Measuring disaster resilience: the impact of hurricane sandy on critical infrastructure systems. ISCRAM 11:195–204

Cova TJ, Johnson JP (2002) Microsimulation of neighborhood evacuations in the urban–wildland interface. Environ Plan A 34:2211–2229

Cova TJ, Drews FA, Siebeneck LK, Musters A (2009) Protective actions in wildfires: evacuate or shelter-in-place? Nat Hazards Rev 10:151–162

Cox RS, Perry KME (2011) Like a fish out of water: reconsidering disaster recovery and the role of place and social capital in community disaster resilience. Am J Community Psychol 48:395–411

Dash N, Morrow BH (2000) Return delays and evacuation order compliance: the case of Hurricane Georges and the Florida Keys. Glob Environ Change Part B Environ Hazards 2:119–128

Drabek TE (1969) Social processes in disaster: family evacuation. Soc Probl 16:336–349

Drabek TE (1999) Understanding disaster warning responses. Soc Sci J 36:515–523

Eisenman DP, Cordasco KM, Asch S, Golden JF, Glik D (2007) Disaster planning and risk communication with vulnerable communities: lessons from Hurricane Katrina. Am J Public Health 97:S109–S115

Fernandez LS, Byard D, Lin CC, Benson S, Barbera JA (2002) Frail elderly as disaster victims: emergency management strategies. Prehosp Disaster Med 17:67–74

Finch C, Emrich CT, Cutter SL (2010) Disaster disparities and differential recovery in New Orleans. Popul Environ 31:179–202

Fussell E, Sastry N, VanLandingham M (2010) Race, socioeconomic status, and return migration to New Orleans after Hurricane Katrina. Popul Environ 3120:42

Glaser BG, Strauss AL (1999) Discovery of grounded theory. Routledge, New York

Groen JA, Polivka AE (2010) Going home after Hurricane Katrina: determinants of return migration and changes in affected areas. Demography 47:821–844

Hasan S, Mesa-Arango R, Ukkusuri SV (2013) A random parameter hazard-based model to understand the temporal dynamics of household evacuation timing behavior. Transp Res Part C 27:108–116

Huang SK, Lindell MK, Prater CS, Wu HC, Siebeneck LK (2012) Household evacuation decision-making in response to Hurricane Ike. Nat Hazards Rev 13:283–296

Kates RW, Pijawka D (1977) From rubble to monument. In: Haas JE, Kates RW, Bowden MJ (eds) Reconstruction following disaster. MIT Press, Cambridge

Kates RW, Colten CE, Laska S, Leatherman SP (2006) Reconstruction of New Orleans after Hurricane Katrina: a research perspective. Proc Natl Acad Sci 103:14653–14660

Kulkarni PA, Gu H, Tsai S, Passannante M, Kim S, Thomas PA, Tan CG, Davidow AL (2017) Evacuations as a result of hurricane sandy: analysis of the 2014 New Jersey behavioral risk factor survey. Disaster Med Public Health Prep 11(6):720–728

Leong KJ, Airriess CA, Li W, Chen ACC, Keith VM (2007) Resilient history and the rebuilding of a community: the Vietnamese American community in New Orleans East. J Am Hist 94:770–779

Li W, Airriess CA, Chen ACC, Leong KJ, Keith VM (2010) Katrina and migration: evacuation and return by African Americans and Vietnamese Americans in an Eastern New Orleans suburb. Prof Geogr 62:103–118

Lin CC, Siebeneck LK, Lindell MK, Prater CS, Wu HC, Huang SK (2014) Evacuees' information sources and reentry decision-making in the aftermath of Hurricane Ike. Nat Hazards 70:865–882

Lindell MK, Perry RW (2003) Communicating environmental risk in multiethnic communities. Sage Publications, Thousand Oaks

Lindell MK, Perry RW (2012) The protective action decision model: theoretical modifications and additional evidence. Risk Anal 32:616–632

Lindell MK, Prater CS (2007a) Critical behavioral assumptions in evacuation time estimate analysis for private vehicles: examples from hurricane research and planning. J Urb Plan Dev 133:18–29

Lindell MK, Prater CS (2007b) A hurricane evacuation management decision support system (EMDSS). Nat Hazards 40:627–634

Lindell MK, Lu JC, Prater CS (2005) Household decision-making and evacuation in response to Hurricane Lili. Nat Hazards Rev 6:171–179

Lindell MK, Kang JE, Prater CS (2011) The logistics of household hurricane evacuation. Nat Hazards 58:1093–1109

Litman T (2006) Lessons from Katrina and Rita: what major disasters can teach transportation planners. J Transp Eng 132:11–18

Manandhar R, Siebeneck LK (2018) Return-entry risk communication challenges: experiences of emergency management organizations following Superstorm Sandy. Int J Mass Emerg Disasters 36:120–148

Masozera M, Bailey M, Kerchner C (2007) Distribution of impacts of natural disasters across income groups: a case study of New Orleans. Ecol Econ 63:299–306

Mesa-Arango R, Hasan S, Ukkusuri SV, Murray-Tuite P (2013) Household level models for hurricane evacuation destination choice using hurricane Ivan data. Nat Hazards Rev 14:11–20

Morrice S (2013) Heartache and Hurricane Katrina: recognizing the influence of emotions in post-disaster return decisions. Area 45:33–39

Morss RE, Lazo JK, Demuth JL (2010) Examining the use of weather forecasts in decision scenarios: results from a US survey with implications for uncertainty communication. Meteorol Appl 17:149–162

Neisser U, Winograd E, Bergman ET, Schreiber CA, Palmer SE, Weldon MS (1996) Remembering the earthquake: direct experience vs. hearing the news. Memory 4(4):337–357

Nelan MM, Schumann RL III (2018) Gathering places in the aftermath of Hurricane Harvey. Disaster Prev Manag 27:508–522

NOAA (2013) Tropical cyclone report Hurricane Sandy, 22–29 October 2012. Blake E, Kimberlain T, Berg R, Cangialosi J, Bevin II J. National Hurricane Center. https://www.nhc.noaa.gov/data/tcr/AL182012_Sandy.pdf. Accessed 26 July 2018

NOAA (2018) National Centers for Environmental Information (NCEI) U.S. billion-dollar weather and climate disasters. https://www.ncdc.noaa.gov/billions/. Accessed 26 July 2018

Peek L, Stough LM (2010) Children with disabilities in the context of disaster: a social vulnerability perspective. Child Dev 81:1260–1270

Phillips BD (2014) Qualitative disaster research. Understanding qualitative research. Oxford University Press, New York

Quarantelli EL (1995) Patterns of sheltering and housing in US disasters. Disaster Prev Manag 4:43–53

Richardson BK (2005) The phases of disaster as a relationship between structure and meaning: a narrative analysis of the 1947 Texas City explosion. Int J Mass Emerg Disasters 23(3):27–54

Sadri AM, Ukkusuri SV, Murray-Tuite P, Gladwin H (2013) How to evacuate? A behavioral model to understand the routing strategies during hurricane evacuation. J Transp Eng 140:61–69

Sadri AM, Ukkusuri SV, Gladwin H (2017) The role of social networks and information sources on hurricane evacuation decision-making. Nat Hazards Rev 18:04017005

Seeger MW, Sellnow TL, Ulmer RR (2003) Communication and organizational crisis. Praeger, Westport

Siebeneck LK, Cova TJ (2008) An assessment of the return-entry process of Hurricane Rita. Int J Mass Emerg Disasters 26:91–111

Siebeneck LK, Cova TJ (2012) Spatial and temporal variation in evacuee risk perception throughout the evacuation and return-entry process. Risk Anal 32:1468–1480

Siebeneck LK, Cova TJ (2014) Risk communication after disaster: return-entry following the 2008 Cedar River flood. Nat Hazards Rev 15:158–166

Siebeneck LK, Lindell MK, Prater CS, Wu HC, Huang SK (2013) Evacuees' reentry concerns and experiences in the aftermath of Hurricane Ike. Nat Hazards 65:2267–2286

Sommerfeldt EJ (2015) Disasters and information source repertoires: information seeking and information sufficiency in postearthquake Haiti. J Appl Commun Res 43:1–22

Stallings RA (1991) Ending evacuations. Int J Mass Emerg Disasters 9(2):183–200

State of New Jersey (2017) Assembly Resolution No. 257. Introduced June 1, 2017, 217th Legislature. Trenton, NJ. http://www.njleg.state.nj.us/2016/Bills/AR/257_I1.HTM. Accessed 26 July 26 2018

Urbanik T, Desrosiers A, Lindell MK, Schuller CR (1980) Analysis of techniques for estimating evacuation times for emergency planning zones (No. NUREG/CR–1745). Texas Transportation Institute

U.S. Census Bureau (2016a) American Community Survey 1-year estimates. Census Reporter Profile page for Ocean County, NJ. https://censusreporter.org/profiles/05000US34029-ocean-county-nj/. Accessed 26 July 2018

U.S. Census Bureau (2016b) American Community Survey 1-year estimates. Census Reporter Profile page for Monmouth County, NJ. https://censusreporter.org/profiles/05000US34025-monmouth-county-nj/. Accessed 26 July 2018

Xiao Y, Van Zandt S (2012) Building community resiliency: spatial links between household and business post-disaster return. Urb Stud 49:2523–2542