Qualitative Study of Homeowners' Emergency Preparedness: Experiences, Perceptions, and Practices

Shane T. Diekman, PhD, MPH;[1] Sean P. Kearney, MD, MPH;[2] Mary E. O'Neil, MPH;[1] Karin A. Mack, PhD[1]

1. Division of Unintentional Injury Prevention, National Center for Injury Prevention and Control, Centers for Disease Control and Prevention, Atlanta, Georgia USA
2. University of Connecticut Health Center, Farmington, Connecticut USA

Correspondence:
  Shane Diekman
  Division of Unintentional Injury Prevention
  National Center for Injury Prevention and Control
  Centers for Disease Control and Prevention
  4770 Buford Hwy, NE, MS K-63
  Atlanta, GA 30341 USA
  E-mail: sdiekman@cdc.gov

Abstract

Introduction: Considerable morbidity, mortality, and costs are associated with household emergency situations involving natural hazards and fires. Many households are poorly prepared for such emergency situations, and little is known about the psychosocial aspects of household emergency preparedness.
Problem: The aim of this study is to promote a better understanding of homeowners' experiences and perceptions regarding household emergency situations and related preparedness practices.
Methods: A brief survey was administered and three focus group sessions were conducted with homeowners (n = 16) from two metro Atlanta homeowners' associations. The survey inquired about basic demographic information, personal experience with a natural hazard or fire, and awareness of preparedness recommendations. The focus group discussions centered on household emergency preparedness perceptions and practices.
Results: Participants defined household emergency preparedness as being able to survive with basic supplies (e.g., water, flashlights) for 48 hours or longer. While most participants had sufficient knowledge of how to prepare for household emergency situations, many did not feel fully prepared or had not completed some common preparedness measures. Concern about protecting family members and personal experience with emergency situations were identified as strong motivations for preparing the household for future emergencies.
Conclusions: The focus group findings indicate that most participants have prepared for household emergency situations by discussing the dangers with family members, stockpiling resources, and taking a CPR or first-aid class. However, to the extent that behavior is influenced, there is a gap between maintaining preparedness levels and internalizing preparedness recommendations. Prevention efforts in Georgia should focus on closing that gap.

Diekman ST, Kearney SP, O'Neil ME, Mack KA: Qualitative study of homeowners' emergency preparedness: Experiences, perceptions, and practices. *Prehospital Disast Med* 2007;22(6):494–501.

Introduction

Weather and fire-related emergencies account for thousands of deaths and injuries each year in the United States, and also account for considerable economic cost. From 1975–1994, events due to natural hazards such as floods, tornados, hurricanes, earthquakes, and fires accounted for an estimated 24,000 deaths and 100,000 injuries in the US.[1] In 2004, four major hurricanes contributed to 124 deaths over a six-week period in the southeastern United States,[2] and in 2005, Hurricane Katrina was responsible for approximately 1,500 deaths.[3] Hurricane Katrina alone was associated with damages exceeding $100 billion.[4]

The injury and economic burden associated with residential fires in the United States also has been substantial. In 2005, residential fires accounted for an estimated 3,675 civilian deaths, 13,825 civilian injuries, and $6.9 billion in direct property damage.[5]

Preparedness is the process of developing a response and management capability before an emergency occurs in order to anticipate and address

potential hazards so that needed resources are in place. At the community, local, state, and federal levels, this process includes establishing hazard detection and warning systems, identifying evacuation routes and shelters, maintaining emergency supplies and communication systems, establishing procedures for notifying and mobilizing key personnel, and educating and training responders, citizens, and community leaders.[6] At the household level, a similar process should be followed, with a focus on developing a family communication and evacuation plan, maintaining a disaster supply kit, and becoming informed about home emergency preparedness.[7] It has been documented that effective preparation and response to events due to natural hazards reduces morbidity and mortality, limits property damage, and minimizes disruptions in daily life.[6]

Emergency preparedness recommendations and campaigns are delivered by several credible federal, state, and local agencies in the US (e.g., the Federal Emergency Management Agency (FEMA), the Centers for Disease Control and Prevention (CDC), the Georgia Emergency Management Agency (GEMA)), and non-governmental organizations (e.g., the American Red Cross). However, these efforts do not guarantee that citizens will prepare their households, even if they are aware of potential hazards. A 2006 American Red Cross poll showed that while most Americans feel prepared for a hurricane or other disasters, most have not taken the suggested preparedness actions, such as identifying a meeting place to reunite with family members or establishing an emergency contact.[8] For example, a survey administered after Florida residents had experienced four major hurricanes during 2004 indicated that 48.7% of respondents had no evacuation plan before any of the hurricanes occurred.[2] This lack of preparedness also is evident in the case of other events due to natural hazards and/or fire in the US.[9–11] Collectively, the current level of US household emergency preparedness is insufficient.[8,12]

Most research has focused on government agency capacity and emergency responders' ability to provide assistance during an emergency situation. The challenge remains to develop an understanding of the role of individual households in emergency preparedness studies. To the authors' knowledge, no studies have used qualitative methods to explore homeowners' perceptions and experiences related to household emergency preparedness. This study examines preparedness for household emergency situations, which include natural hazards and home fire events. The aim of this study is to better understand homeowners' perceptions and experiences regarding household emergency situations and related preparedness behaviors.

Methods
Recruitment
Individuals from two metro-Atlanta homeowners' associations were contacted about study participation through established telephone, e-mail, and newsletter networks. This process included providing association members with general information about the study, such as dates and times for the focus group discussions and instructions on how to participate. Potential study participants had to be English-speaking and at least 18 years of age. Two focus groups were formed at the first site, and one focus group at the second site.

Data Collection and Instruments
This qualitative study was performed between September 2005 and January 2006. Data were collected at each site, starting with a brief survey and following with a focused, group discussion.

At each site, participants provided informed consent and completed a five-minute survey that inquired about demographic and household characteristics, previous experience with household emergencies, and awareness of emergency preparedness recommendations. Next, a focus group was conducted with the participants. A focus group moderator's guide was developed to facilitate discussion concerning household emergency preparedness. The main questions focused on current household emergency preparedness behaviors, perceptions about the meaning of preparedness, perceptions of the consequences of not preparing, barriers and benefits to preparing, potential motivating factors, and awareness of preparedness recommendations and message sources. Probe questions, used to supplement the main questions or elicit more specific information, were driven by behavioral and social science theories. In particular, constructs from the Health Belief Model[13,14] were incorporated to facilitate inquiry about perceived threat (susceptibility and severity), perceived benefits, potential cues to action, and efficacy expectations. The focus group sessions were audiotaped; each lasted 60–90 minutes. At the conclusion of each session, participants were compensated with $20 for their time.

Approval to conduct this study was obtained from the Institutional Review Boards at both the CDC and the University of Connecticut Health Center.

Data Analysis
Descriptive statistics were used to characterize the participants' demographic information, personal experience with an event related to a natural hazard or fire, and awareness of preparedness recommendations.

The qualitative analytic dataset was formed by combining text files from the focus group transcripts and facilitators' notes. The data were structured according to the main focus group questions. A thematic analysis was performed, adapting procedures outlined by Joffe and Yardley,[15] which included the following steps: (1) reading each transcript several times and making notes about potential codes (i.e., units of data, such as a word, sentence, or paragraph); (2) entering text into ATLAS.ti (Scientific Software Development, Berlin, Germany), a software program used for storage, retrieval, and analysis of qualitative data; (3) assigning preliminary codes to corresponding text; (4) resolving discrepancies among the preliminary codes to form permanent codes; (5) examining permanent codes to identify patterns or themes in the data; (6) cataloguing patterns and themes; and (7) selecting illustrative quotations that capture the essence of identified patterns and themes.

Characteristic	Number	Percent (%)
Age (years)		
31–40	3	19
41–50	8	50
51–60	5	31
Female	10	63
Educational Level		
College 1–3 years/Technical School	3	19
College ≥4 years	13	81
Race		
White	16	100
White and American Indian/Alaskan Native	1	7
White and Hispanic or Latino/Latina	2	13
Current Years at Residence		
1–5	4	25
6–10	8	50
11 or more	4	25
Households With Members Who Were…		
<18 years old	11	69
≥65 years of age	2	13
Annual Household Income*		
$20,000 to 24,999	1	7
≥75,000	14	93

Diekman © 2007 Prehospital and Disaster Medicine

Table 1—Descriptive characteristics of household emergency preparedness focus group participants (n = 16)[†]
[†]The three focus groups were composed of seven, seven, and nine individuals respectively.
[*]Percentages are based on a total of 15 responses.
Percentages may not equal 100% due to rounding. As previously noted, all participants identified themselves as White, but three members also identified themselves as of another race.

Results

Participant Characteristics

Table 1 contains descriptive characteristics of the 16 focus group participants. The median age for participants was 46 years, with a range from 32 to 59 years. Participants were predominantly female and college-educated. All of the participants self-identified as being white, and three participants also identified with another race or ethnicity (American Indian/Alaska Native, Hispanic or Latino/Latina). Participants lived in their current residence for a median of 8.5 years. The household size ranged from one to five individuals, and most households had residents under the age of 18 years. Ninety percent of participants had an annual household income of ≥$75,000.

Emergency Situation Experiences, Awareness, and Preparedness Levels

Thirteen participants (81%) had previous experiences with an event related to a natural hazard or fire, and of these, almost all (n = 11; 85%) had multiple experiences. The types of events participants identified included snow or ice storms (n = 10; 63%), hurricanes (n = 7; 44%), floods (n = 4; 25%), tornadoes (n = 3; 19%), and fire (n = 2; 13%).

The percentage of participants who indicated having either "never heard or thought about," "heard or thought about," or "completed or did" 10 commonly recommended

tasks to complete when preparing for household emergencies are provided in Table 2. These tasks were based on American Red Cross household emergency preparedness recommendations.[7] One preparedness recommendation ("learn your community's evacuation routes") was relatively unfamiliar; six respondents indicated they had never heard of or thought about it.

Focus Group Findings

The main findings developed from the focus groups are provided in seven sections: (1) what household emergency preparedness means; (2) factors influencing emergency preparedness levels; (3) perceived threat of emergency situations; (4) benefits and barriers to preparing for emergency situations; (5) preparedness motivating factors; (6) emergency preparedness messages and recommendations; and (7) Hurricane Katrina.

What Household Emergency Preparedness Means—Participants spoke about what the term "emergency preparedness" meant to them, what they would expect to cope with during an emergency situation, and how they would prepare for such a situation. In general, participants defined household emergency preparedness as being able to "survive" from two days to one week with basic supplies such as water, food, batteries, and flashlights. All focus groups

Preparedness Recommendation	Never Heard or Thought About n (%)	Heard or Thought About n (%)	Completed or Did n (%)
Learn your community's evacuation routes	6 (38)	6 (38)	4 (25)
Draw a floor plan of your home and mark the escape routes from each room	2 (13)	10 (63)	4 (25)
Learn how to prepare for each hazard that could occur in your area	0 (0)	10 (63)	6 (38)
Find out which natural hazards could occur in your area	0 (0)	8 (50)	8 (50)
Learn how you will be warned of an emergency	1 (6)	5 (31)	10 (63)
Take a basic first aid and CPR class*	1 (7)	4 (27)	10 (67)
Stock emergency water and food at home	0 (0)	4 (25)	12 (75)
Meet with household members to discuss the dangers of fire, severe weather, hurricanes and other emergencies	1 (6)	1 (6)	14 (88)
Maintain a battery-operated radio to receive emergency information	0 (0)	1 (6)	15 (94)
Maintain a fire aid kit at home	0 (0)	1 (6)	15 (94)

Diekman © 2007 Prehospital and Disaster Medicine

Table 2—Participants' awareness and achievement levels regarding common household emergency preparedness recommendations (n = 16) (CPR = cardiopulmonary resuscitation)
*Percentages are based on a total of 15 responses.
Percentages may not equal 100% due to rounding.

talked about stocking various types of supplies needed for survival as part of their definition of preparing for an emergency. For instance, one participant defined preparedness as "Being sure that your house is stocked for just about any emergency, whether it's electrical power outages, or [something else], [with] fire extinguishers, or food and water supplies."

Self-reliance during an emergency situation was a prevalent concept. When questioned about what marked the beginning and end of this period of self-reliance, participants indicated that this period began at the inception of the emergency and lasted until help or relief efforts arrived, a state of normalcy (e.g., power restored) was regained, or both. During this time period, households were expected to survive without help from local, state, and/or federal agencies. Participants stressed personal responsibility in preparing for and responding to household emergency situations. This belief was influenced by the perception that emergency relief efforts were ineffective during the Hurricane Katrina response and, consequently, many victims were without aid for extended periods of time. For example:

They think that the government's there to help, but the government is a huge, moving, large animal that's very slow and you gotta help yourself. The government can't be there to bail you out every time. You have to help yourself and then hopefully later (the government will help), but it's going to take a long time.

The notion of not expecting state or federal relief aid for a period of time was reinforced by participants who mentioned relying on neighbors for assistance and information during emergency situations.

Factors Influencing Emergency Preparedness Levels—Three factors influenced personal levels of emergency preparedness. First, preparedness varied depending on the type of emergency situation. For example, one participant commented that preparedness deals with "...one kind of thing like a natural disaster and the other kind of thing... like 9/11." Second, participants indicated that they prepared differently depending on the season (e.g., hurricane season, winter storms). As one participant noted, "As it gets nearer to winter time, I'll be prepared a little bit more for a snow storm or ice storm...in late April, I don't need to worry about that anymore, and I let it go." Third, some participants noted that their level of preparedness depended on personal experiences. For example, when describing how experiencing a fire influenced the level of preparedness for household fires, one participant stated, "Since I went through a fire, I am totally terrified of fire. That's what my focus is."

Perceived Threat of Emergency Situations—Participants identified several types of emergency situations to which their households might be susceptible. Table 3 summarizes the participant responses. The responses varied, but at least one member in each focus group listed ice storms, tornados, and hurricanes.

In the discussion of potential household emergency threats, there were conflicting opinions about whether terrorist events could impact individual households, and therefore, warrant precautionary measures.

The thing I've thought about for a year during and after 9/11 was [terrorists] getting into the water supply— putting some kind of poison in the water supply or some-

Emergency Situation
Accidental poisonings
Chemical spills
Earthquakes
Falling
Fire
Flooding
Hurricanes
Ice storms
Lightning
Medical emergencies
Power outages
Severe thunderstorms
Terrorist attacks
Tornados

Diekman © 2007 Prehospital and Disaster Medicine

Table 3—Types of household emergency situations participants' indicated they might experience

thing like a chemical agent or a biological agent that might hurt us out here. But, you know, outside of that, you know, I don't see them running a plane into the clubhouse.

Participants discussed the consequences of emergency situations, with several individuals acknowledging that household emergency situations could be life-threatening. Absent in the discussions, however, was any indication that these events necessarily would happen to the individual participant talking about them. In addition, although property loss was not discussed as a consequence, it was mentioned when participants were asked later in the discussion about what they were protecting when they prepared their households for emergency situations.

Benefits and Barriers to Preparing for Emergency Situations—
Being prepared for household emergencies gave the homeowner the peace of mind that, if an emergency were to occur, measures were in place to mitigate the damages. As one participant stated, "I feel like I'm as well prepared as I can be, and it gives me a peace of mind, and it gives me permission to say, 'Whatever will be, will be.'"

Participants reported that being prepared decreases panic and fear in an emergency situation, allowing the household to remain calm and focused on survival. A participant noted that "in New Orleans there is this panic that seems to be overtaking people. I would hope if I'm prepared that I could react kind of calmly." Another participant stated,

I think a key aspect with preparedness is that you try to minimize panic because in states of panic you just are not thinking clearly, you're reacting in the moment rather than what you may have practiced or may not have practiced for that matter. It's minimizing panic.

Additionally, participants noted that failing to prepare often leads to civil disorder.

I mean, there's just this hoarding mentality like, you know, that's understandable for survival things, but at the same time it's awfully fearful that, you know—there's a man who shot his sister over a bag of ice... you want to try to keep yourself from becoming animalistic. I just think you maintain a civility if you're prepared. If you're

not prepared, I think you become, you know, self-centered and you forget all about being civil to neighbors.

Participants discussed two main barriers to household preparation: supply logistics and lack of communication. Participants noted the difficulty in keeping track of expired supplies and the reality that emergency supplies often get used or misplaced in the course of everyday life. For instance, one participant expressed the difficulty of keeping supplies stocked and organized, "especially when kids play with them." Another participant stated,

...every week I would go to the grocery store and I would buy a gallon of water and put it in the garage. And then something came along and we took a gallon to the boat, then we took a gallon out to the dog pen, and the next thing I knew, my storage of water was gone and I didn't have any any more.

Several participants noted that financial concerns were not an issue when it came to stocking supplies, whereas this might be a problem for other communities whose residents were not as financially advantaged. For instance, one participant stated,

...our incomes are probably more than twice or more than the average of the incomes in this state, so I mean, we're not a perfectly representative sample of the entire state. We have more expendable income and we can buy cases of water, where most people would be like, 'Ten bucks? I'm not wasting that...

All focus groups mentioned how inadequate communication can be a barrier to emergency preparedness and response, although each group had unique discussions surrounding this issue. One group discussed the need to develop communication plans with family members if separated during an emergency event. Another group talked about how the federal, state, and local governments must communicate how they will respond during an emergency situation more effectively; participants felt that they could better prepare their households if the government outlined exactly what resources are needed. Another group discussed how information would be exchanged between emergency responders and community members. For instance, one group member stated, "it's a question in my mind about how the community government...would communicate to people that there is some kind of emergency and that you must leave."

Preparedness Motivating Factors—All focus groups discussed protecting family members and prior experiences with emergency situations as motivators for preparing their homes.

When discussing family as a motivator, all focus groups noted that having children in the household prompted preparedness actions. Children acted as motivators in two ways. Primarily, parents felt preparedness was necessary to protect their children. But parents also discussed how their children's school work and involvement in community groups, such as the Boy and Girl Scouts, prompted them to complete preparedness activities, including developing evacuation plans in the event of a fire. Additional family members also served as motivators for other focus groups. In one focus group, members discussed elders in the home. In addition, the notion of preparing for an emergency situation extended beyond the participant's own home and

included the participant/spouse's parents' homes. For example, one group member commented,

> Well, my parents are both older and my father has got severe emphysema...my mother is physically disabled. She can't get around as well, so we know that they are pretty much like children. We have to be 100% responsible for them in an emergency situation.

Some participants talked about pets as a motivator to prepare the household. One member stated, "I value my family's lives and our cats' lives. That's the only thing I really care about protecting." In this sense, pets were considered part of the family and were afforded considerations and protections similar to that of other family members.

Past personal experiences were cited as motivations to prepare in all focus groups. There were several ways that each focus group expressed this point:

> The first ice storm we went through was in Nashville area, and right after that was when I got the generator.

> Every time we see any kind of winter weather approaching, we still remember three days with no electricity...just that experience.

> Living through something, because if you live through it, you get prepared for the next one.

In addition, several participants indicated that past events that they did not experience directly, most notably 9/11, influenced their perceptions about emergency situations and how they would potentially prepare for future disasters.

Emergency Preparedness Messages and Recommendations— Participants discussed heightened public warning messages, particularly the US Department of Homeland Security's Threat Advisory. Two focus groups noted that the advisory system was ineffective and less credible after being elevated for long periods of time without any incidents. One participant said, "It's been yellow and orange for the majority of that time, which makes me think that maybe it's not such a good plan because it loses credibility." In a follow-up comment, another participant said, "I think there's something kind of silly about leaving a threat level that high without any real explanation."

The sources cited for obtaining emergency information were mostly media outlets, specifically 24-hour news channels and the Weather Channel. Other sources cited were social networks, including family, friends, and neighbors. All groups noted that too much information often hinders acceptance of warning messages and preparedness recommendations. In discussions about receiving warning information, one participant noted that, "It would be nice to have a specific channel or frequency that was maybe specifically just the details, without the sensationalism, because you need real information." When discussing recommendations about household fire safety, one participant stated, "you give people too much information, then they just ignore it." Another participant expressed a similar sentiment by saying, "they [terror attack warning messages] come so frequently and we're so used to them now that you don't really pay attention so much now."

Hurricane Katrina—Shortly before the first focus group was conducted, Hurricane Katrina devastated many Gulf Coast states. All focus groups were asked how hearing about this recent disaster due to a natural hazard impacted their motivations to prepare their households. There was no discernable pattern in the data regarding the influence of Hurricane Katrina on the participants' awareness levels or behaviors. In each focus group, some members said that Hurricane Katrina either had no effect on their motivations to prepare, and some members stated that it increased their awareness of the possibility of such household emergencies. None of the groups talked about taking actual actions to prepare their households on the basis of hearing about Hurricane Katrina. Participants expressed fatalistic views toward some catastrophic events, such as a hurricane. According to one participant, there was no additional motivation to prepare because, "It's [Hurricane Katrina] not immediate for us." On the other hand, another participant stated,

> It has sort of impacted the way I look at my household, even though mostly in terms of keeping more food and water on hand, but it has demonstrated that there can be very catastrophic, unanticipated things that happen. You just have to be prepared for that.

Discussion

This study found that most focus group members were familiar with and understood the most basic household emergency preparedness warning messages and recommendations. Participants perceived several benefits of preparing for, and consequences of not preparing for household emergency situations. Many of the homeowners completed basic preparedness recommendations, such as stocking supplies (e.g., food and water) and completing CPR and first-aid classes. However, through the focus group discussions, it became evident that there were gaps in maintaining resources, revisiting evacuation and communication plans, and internalizing threats. These findings corroborate a recent American Red Cross survey that indicates, "...most [Americans] have not taken even the basic steps needed to prepare for a disaster or emergency situation".[8]

One possible explanation why individuals may not adhere to household preparedness recommendations is that their beliefs, and not merely their knowledge, may not support taking these actions. The Health Belief Model is a behavioral science theory that often is applied to health behaviors that involve risk assessment.[16] According to this model, an individual will engage in the proper health behaviors if he or she possesses certain belief patterns. Specifically, the individual must perceive a health threat, believe that threat is avoidable, have an expectation that taking recommended actions will help to avoid the health threat, and believe that he or she can successfully complete the recommended preventive actions. In the context of household emergency preparedness, one should not expect an individual to effectively prepare his/her household if there has been no internalization of a perceived threat, even if that individual believes that the threat can be averted by taking appropriate precautions.

Participants believed that households should be prepared with survival supplies for at least two days, and up to

one week. This is fairly consistent with CDC and Red Cross guidance to the public, which indicates that households should store at least a three-day supply of water and consider storing a two-week supply of both food and water if possible, for each household member.[17] Each state has an emergency management agency responsible for providing emergency preparedness, response, and recovery capabilities to its citizens. In Georgia, the location of this study, GEMA operates several programs and services concerned with emergency preparedness. For example, GEMA helps analyze potential hazards that communities and schools might face and develops mitigation strategies and emergency operations plans and exercises to address these hazards.[18] However, a community-based needs assessment conducted with public health workers in the state of Georgia revealed a gap between job responsibilities and the related abilities of the public health workforce.[19] This gap could result in a reduced ability to provide timely access to necessary resources in an emergency situation.

There are several strengths of this study. It relied on focus group discussions with homeowners to investigate the experiences and perceptions associated with household emergency preparedness. This method resulted in information-rich data and allowed homeowners to have a "voice" in the understanding of this issue. To date, no other studies have used qualitative methods to explore this topic. This study also was guided by well-established theories about preventive behaviors, theories that were used to frame the focus group questions and interpret the results.

This study also had several limitations. Although data saturation occurred on a few topics, additional focus groups may have provided data to clarify and strengthen some of the reported findings. Lack of generalizability was another weakness. The homeowners' associations included in this study were identified through co-workers and were based in the Atlanta metro area, both for convenience. These factors resulted in selection of focus group participants in a primarily white, affluent, and highly educated area of Atlanta that is not representative of the general Atlanta or Georgia populations. Furthermore, homeowners voluntarily chose to participate in the focus groups. This self-selection bias may have resulted in participants who are more prepared for household emergency situations than other members of the general population. However, it is noted that study participants were not fully prepared for household emergency situations, particularly in terms of maintenance.

Implications for Practice and Research
A major practical implication arising from this research is the need to design prevention messages that help internalize personal risks for experiencing household emergency situations by raising the perceived threat of such events. Messages should increase the public's perceived susceptibility to these events by relaying the risk of experiencing these events in ways that are more understandable to the public. For example, social math, which is a strategy for making numbers and statistics meaningful to an audience,[20] could be used to compare the threat of hurricanes with more familiar events to the public. These messages also may ben-

efit by capitalizing on two motivators mentioned in the focus groups: concern about protecting one's family and past experiences. In addition to raising the level of the perceived threat, these messages simultaneously must provide appropriate and achievable preparedness actions. Messages that contain only threat elements may result in audience members' attempting to control their fear of the threat through maladaptive responses, such as ignoring the message completely rather than managing the actual danger through appropriate behavioral changes.[21-24] For example, messages that contain social math examples to raise perceived susceptibility must be accompanied by preparedness actions such as "holding a family meeting to discuss and practice evacuation from the home in the event of a fire."

For the public health worker, it is important to effectively communicate the personal risk of experiencing a household emergency situation. In doing so, public health workers must help individuals realize that these risks are great enough to warrant taking the appropriate preparedness actions. Barriers to engaging in recommended behaviors, such as time and supply management, must be addressed.

It also is important to gain insight on how best to encourage households to improve or maintain their preparedness efforts, particularly because households may have to wait 72 hours or longer for assistance from fire, police, medical, food, shelter, and communications organizations, depending on the scope of an emergency.[17] Households should be prepared to help themselves during the time after an emergency when local, state, and national relief agencies may be unable to respond fully and immediately.[25,26] Prepared households with the ability to help themselves also will free emergency relief agencies to focus resources on re-establishing vital functions, such as utilities, communications, transportation routes, medical facilities, and performing search and rescue operations.[27] In addition, as more households become prepared, initial assistance could be directed toward vulnerable populations, such as the elderly, children, disabled, and those with inadequate social and economic support.

Realizing the potential impact that concern for family and personal experience have on encouraging household emergency preparedness actions, it is suggested that these motivations become the targets of future research studies and preparedness campaigns attempting to encourage households to convert their knowledge into action. To accomplish this, several approaches are suggested. First, future research should focus on how best to incorporate the family into emergency warnings and preparedness recommendations. Involving the entire family unit in preparedness campaigns might better encourage individuals to properly assess potential risks or internalize warning messages or preparedness recommendations. Second, using traditional methods of providing information and passively relying on individuals and families to apply that information may not result in substantial preparedness efforts. Campaigns that actively involve not only homeowners and their families, but also entire neighborhoods and communities, should be developed and evaluated. This study's focus group findings and the literature[6,27] indicate that residents often rely on

neighbors during emergency situations. Such campaigns would foster bonds between neighbors, bonds that might be important in future emergency situations. In addition, future research should investigate individual knowledge of community evacuation plans, because communication of these evacuation plans were noted as a particular area of neglect in this study.

Conclusions
Current recommendations suggest that individuals should be prepared to withstand emergency situations for at least 72 hours and up to two weeks before adequate relief may be provided.[17] The focus group findings suggest that participants have not internalized recommendations to the point at which some preparedness behaviors and maintenance practices are influenced. Preparedness messages simultaneously must provide appropriate and achievable preparedness recommendations. The findings of this research among Atlanta-homeowners suggest that continued prevention efforts in Georgia are needed to help prepare the public for household emergency situations. Future studies should focus on barriers to maintaining preparedness or changes in the state of preparedness. In the meantime, attention must be directed at emphasizing the benefits of taking recommended action to avert negative health outcomes.

References
1. Mileti DS: Disasters by design: *A Reassessment of Natural Hazards in the United States.* Washington, DC: Joseph Henry Press, 1999.
2. Bailey MA, Glover R, Huan Y: Epidemiologic assessment of the impact of four hurricanes—Florida, 2004. *MMWR* 2005;54(28):693–697.
3. Knabb RD, Rhome JR, Brown DP: Tropical cyclone report: Hurricane Katrina, 23–30 August 2005. Miami, FL: National Oceanic and Atmospheric Administration, National Weather Service, National Hurricane Center; December 20, 2005 [Updated 10 August 2006]. Available at http://www.nhc.noaa.gov/pdf/TCR-AL122005_Katrina.pdf. Accessed 20 September 2006.
4. Infoplease: US Hurricanes. 2005 Pearson Education, publishing as Infoplease. Available at http://www.infoplease.com/ipa/A0001443.html. Accessed 23 May 2006.
5. Karter MJ: Fire loss in the United States during 2005—full report. Quincy, MA: National Fire Protection Association, Fire Analysis and Research Division. Available at: http://www.nfpa.org/assets/files/PDF/OS.fireloss.pdf. Accessed 01 February 2007.
6. Mileti DS, Peek LA: *Handbook of Environmental Psychology.* New York: John Wiley & Sons, Inc., 2002.
7. American Red Cross: Get prepared. Available at http://www.redcross.org/services/prepare/0,1082,0_77_,00.html. Accessed 06 February 2007.
8. American Red Cross: Preparedness poll. Available at http://www.redcross.org/pressrelease/0,1077,0_314_5398,00.html. Accessed 26 May 2006.
9. Norris F: Epidemiology of trauma: Frequency and impact of different potentially traumatic events on different demographic groups. *J Consult Clin Psychol* 1992;60:409–418.
10. Harris Interactive: Fire prevention week survey—Fall 2004. Conducted for the National Fire Protection Association. Available at http://www.nfpa.org/assets/images/Public%20Education/FPWsurvey.pdf. Accessed 16 May 2006.
11. Edwards ML: Social location and self-protective behavior: Implications for earthquake preparedness. *International Journal of Mass Emergencies and Disasters* 1993;11(3):293–303.
12. Mason-Dixon Polling and Research, Inc: Costal state residents fail hurricane safety test. Available at http://hurricanesafety.org/mediakit/masonDixon_poll.pdf. Accessed 16 April 2006.
13. Hochbaum GM: Public Participation in Medical Screening Programs: A Sociopsychological Study. PHS publication no. 572. Washington, DC: US Government Printing Office, 1958.
14. Janz NK, Champion VL, Strecher VJ: The Health Belief Model. In: K Glanz, B Rimer, F Lewis (eds): *Health Behavior and Health Education.* 4th ed. San Francisco: Jossey-Bass, 2002, pp 45–66.
15. Joffe H, Yardley L: Content and Thematic Analysis. In: D Marks, L Yardley (eds): *Research Methods in Clinical and Health Psychology.* London: Sage Publications, 2003, pp 56–68.
16. Glanz K, Rimer BK, Lewis FM (eds): *Health Behavior and Health Education: Theory, Research, and Practice.* 2nd ed. San Francisco: Jossey-Bass, 1997.
17. American Red Cross: Emergency food and water supplies. Available at http://www.redcross.org/preparedness/cdc_english/foodwater-1.asp. Accessed 16 February 2007.
18. Georgia Emergency Management Agency: Available at http://gema.georgia.gov/01/home/0,2197,868212,00.html. Accessed 15 May 2006.
19. Childers W, Alperin M, Miner KR: Emergency preparedness in Georgia: An assessment of public health training needs. *American Journal of Health Education* 2005;36(5):287–294.
20. Wallack L, Woodruff K, Dorfman L, Diaz I: *News for a Change: An Advocates Guide to Working with the Media.* Thousand Oaks, CA: Sage Publications, 1999.
21. Gore TD, Bracken CC: Testing the theoretical design of a health risk message: Re-examining the major tenets of the extended parallel process model. *Health Educ Behav* 2005;32(1):27–41.
22. Witte K: Putting the fear back into fear appeal: The extended parallel process model. *Communication Monographs* 1992;59:329–349.
23. Witte K: Fear control and danger control: A test of the extended parallel process model (EPPM). *Communication Monographs* 1994;61:113–132.
24. Witte K, Allen M: A meta-analysis of fear appeals: Implications for effective public health campaigns. *Health Educ Behav* 2000;27:591–615.
25. American Red Cross: Welcome to preparedness today. Available at http://www.redcross.org/preparedness/cdc_english/home.asp. Accessed 16 February 2007.
26. Federal Emergency Management Agency (FEMA): Are you ready? Available at http://www.fema.gov/areyouready/emergency_planning.shtm. Accessed 05 February 2007.
27. Blanchard-Boehm RD: Understanding public response to increased risk from natural hazards: Application of the hazards risk communication framework. *Int J Mass Emerg Disasters* 1998;16(8):247–278.