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RACE AND INCOME DISPARITIES IN DISASTER PREPAREDNESS IN OLD AGE

BY

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B.S. Human Services, University of Phoenix, 2014

THESIS

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ABSTRACT

RACE AND INCOME DISPARITIES IN DISASTER PREPAREDNESS IN OLD AGE

by

Katherine Cox

University of New Hampshire, May 2017

Older adults are one of the most vulnerable populations impacted by disasters and communities continue to struggle addressing preparedness. This study investigated to what extent income status and race/ethnicity in old age interplayed with disaster preparedness. Data came from the 2010 Health and Retirement Study, a nationally representative panel survey of older Americans over 51 years old. Our sample was restricted to respondents who participated in a special survey about disaster preparedness (N=1,705). Disaster preparedness was measured as a score, which includes 13 variables related to personal, household, program, and medical preparedness. Race/ethnicity was categorized by White, Black, and Hispanic. Low income was defined as below 300% of the federal poverty line. OLS regression was used to examine the main and interaction effects of race/ethnicity and lower income status on disaster preparedness scores.

We found that older adults in lower income status had lower preparedness level than those in higher income (Coef. =-0.318, $p<.01$). Hispanics tend to be less prepared compared to White and Blacks (Coef. =-0.548, $p<.001$). Preparedness of Black elders was not significantly different from that of Whites. However, interestingly, Black elders in lower income status were significantly less prepared for disaster than other groups (Coef. =-0.520, $p<.05$). We did not find significant interaction effects between Hispanic and lower income status on disaster

preparedness. This study identified vulnerable subgroups of older adults for disaster preparedness and suggests that preparedness programs should target minority and low income elders, particularly Hispanics and low income Black elders.

Introduction

According to the Office of Disease Prevention and Health Promotion (2014), individuals in the United States are at risk of living through potential disease outbreaks, natural disasters, and/or terrorist attacks. To prepare, communities place emphasis on improving their prevention and recovery systems, and expanding their knowledge base (U.S. Department of Health and Human Services, 2014). The older adult population has been demonstrated to be one of the most vulnerable populations greatly impacted in most emergencies, natural disasters, and disease outbreaks (The Gerontological Society of America [GSA], 2012; Muramatsu & Akiyama, 2011). Certain characteristics of the aging population put them at greater risk of negative consequences during and after these types of events (Centers for Disease Control and Prevention [CDC], 2012). Specifically, older adults may have impaired physical mobility or cognitive ability, diminished sensory awareness, and social and economic limitations (Fernandez, Byard, Lin, Benson, & Barbera, 2002). Declining vision or hearing can make it difficult for an older adult to communicate. Older adults with cognitive problems may become agitated during a crisis or feel overwhelmed by the crowding, noise, and lack of privacy in a shelter (Fernandez et al., 2002). They may need assistance to ensure that they have their medications, adequate nutrition and water, and assistive devices (CDC, 2005). Older adults also may be more vulnerable to emotional trauma during a disaster (Young, Ford, Ruzek, Friedman, & Gusman, 1998).

Communities continue to struggle to devise appropriate plans, identify older and disabled people, and disseminate important information before, during, and after events (GSA, 2012; Gibson & Hayunga, 2006; O'Brien, 2003). While all human service agencies, emergency response organizations, and families should have a formal plan to address vulnerable populations, many previous disasters have highlighted the lack of assistance and attention to the

elderly population (Major, Dubovsky, & Byrd, 2015). One major limitation in the planning process is the lack of consensus on the best way to prepare older adults, identify those most vulnerable, and protect them in emergency or disaster situations (CDC, 2012). Considering the aging population is growing, communities must endeavor to develop action plans to address the vulnerabilities of the older individuals who may need special care and attention.

Although the older population is vulnerable during and after disasters, unfortunately, this population has been known to be less likely to be prepared for disasters or emergencies (Al-rousan, Rubenstein, & Wallace, 2014; Boscarino, Adams, Figley, Galea, & Foa, 2006; CDC, 2012). Age plays a vital role in an individual's cognitive and physical ability to prepare for potential disasters in their neighborhood (Eisenman, Wold, Fielding, Long, Setodji, Hickey & Gelberg, 2006; Fox, White, Rooney, & Rowland, 2007). Specifically, Al-rousan and his colleagues (2013) found that many elders did not have an emergency plan, have not tested their smoke/fire detectors during the year prior to the survey, and many had not registered for any disaster help or program. In addition, over half of their sample did not know of their nearest shelter in their community and only a small portion of the sample reported speaking with their health care providers about disaster preparedness. Moreover, it is also found that preparedness decreases among the elderly with health-related disabilities. In this respect, it is important to investigate risk factors that negatively influence disaster preparedness among older adults (Boscarino et al., 2006).

In recent decades, many studies have investigated what populations face barriers when accessing disaster programs (Eisenman, Glik, Maranon, Gonzales, & Asch, 2009), reaching out to local organizations (Fothergill, Maestas, & Darlington, 1999; Fothergill & Peek, 2004), and paying for the materials and services required before a disaster event (Blessman, Skupski, Jamil,

Jamil, Bassett, Wabeke, & Arnetz, 2007). They have found that a variety of factors including older age, low socioeconomic status, racial/ethnic minority, perceived threat, and physical and mental health are associated with disaster preparedness (Ablah, Konda, & Kelley, 2009; Boscarino et al., 2006; Eisenman et al., 2006; Feret & Bratberg, 2008; Hausman, Hanlon, & Seals, 2007; Kohn, Eaton, Feroz, Bainbridge, Hoolachan, & Barnett, 2012; Murphy et al., 2009; Page, Rubin, Amlot, Simpson, & Wessely, 2008; Paton, Parkes, Daly, & Smith, 2008; Phillips, Metz, & Nieves, 2005; and Smith & Notaro, 2009). However, the findings across these studies are not consistent because their samples tended to be limited to specific geographic areas (Cutter, Mitchell, & Scott, 2000; King, 2001; Plough, Fielding, Chandra, Williams, Eisenman, Wells, Law, Fogleman, & Magaña, 2013), specific disasters (Brodie, Weltzien, Altman, Blendon, & Benson, 2006; Elliot & Pais, 2006; Pastor, Bullard, Boyce, Fothergill, Morello-Frosch, & Wright, 2006), or focusing on lifespan vulnerabilities (Cutter, Boruff, & Shirley, 2003). Moreover, many studies are post-disaster research, and they were asking participants to reflect on their preparedness after they had experienced a disaster (Ablah et al., 2009; Elliot & Pais, 2006; Fothergill et al., 1999; Fothergill & Peek, 2004; Murphy, Cody, Frank, Glik, & Ang, 2009; and Phillips et al., 2005). Also, there is still limited knowledge on disaster preparedness among older adults, one of the most vulnerable populations for disasters. In order to develop effective action plans for disaster preparedness in communities, there is still a need to identify the populations at risk.

Therefore, this study aims to identify subgroups of the older population who are most vulnerable for disaster preparedness, and to investigate factors that deter elders from disaster preparedness. In particular, this study focused on two factors, income and race/ethnicity, and

examined to what extent and how these two factors independently and interdependently affect disaster preparedness.

In recent decades, studies have shed light on income (Blessman et al., 2007; Eisenman et al., 2009; Elliot & Pais, 2008; and Fothergill & Peek, 2004) and race (Andrulis, Siddiqui, & Gantner, 2007; Elliot & Pais, 2006; Fothergill et al 1999; and Page et al., 2008) as key risk factors of disaster preparedness. First, research has revealed that preparedness increases as income level increases (Al-rousan, 2013; Blessman et al, 2007; Eisenman et al., 2006; Eisenman et al 2009; Elliot & Pais, 2008; Fothergill & Peek, 2004; and Turner et al., 1986). In addition, the poorest in the United States were found to be living in crisis prior to a disaster event and to have inadequate resources to prepare for a disaster (Fothergill & Peek, 2004; Frumkin, 2011; Peacock & Ragsdale, 1997). This was further illustrated by Flanagan, Gregory, Hallisey, Heitgerd, & Lewis (2011), who utilized a social vulnerability index to identify social and population characteristics of the poor, whose needs are not sufficiently being met in regards to preparedness. Unfortunately, neighborhoods which experience pre-existing social, physical, and economic vulnerabilities are less prepared for disasters (Masozera, Bailey, & Kerchner, 2007). In addition, it is important to consider the historical disparities in the sociodemographic structure of the United States, which has shaped how low-income residents utilize neighborhood resources to engage in preparedness activities (Finch, Emrich, & Cutter, 2010). Being poor not only affects an individual's experience during a disaster, it also impacts how risk is perceived and prepared for (Murphy et al., 2009), which is intensified by economic, social, and environmental injustices (Finch et al., 2010).

Furthermore, natural disasters have demonstrated that racial/ethnic minority groups are disproportionately affected by disasters (Fothergill et al, 1999) and less prepared for disasters

when compared to Whites (Andrulis et al, 2007; Perry et al, 1982; Fothergill et al., 1999; Eisenman et al 2009). There are links between racism and vulnerability in disaster preparedness and recovery that have been explored. For example, Elliot & Pais (2006) indicate that individuals recognize threats of disaster in a manner reflective of the social and economic resources available. There are uneven geographic development and allocation of resources and services which have produced neighborhood characteristics with existing and complex relations of racial/ethnic and income disparities (Elliot & Pais, 2006; Fothergill et al., 1999). Existing studies on racial/ethnic differences range across time, events, location, and racial/ethnic groups, posed a challenge to identify any specific vulnerability patterns. However, prior research has described the non-random ways in which individuals of minority groups are disproportionately impacted by disaster events which is indicative of pre-existing racial/ethnic divisions influencing preparedness (Andrulis et al., 2007; Fothergill et al., 1999). Specifically, minority and race have been associated with lower scores on preparedness surveys (Murphy et al., 2009) and less overall preparedness prior to a disaster (Edwards, 1993; Paton et al., 2008). In discussion of how race/ethnicity is associated with disaster preparedness, it is important to touch on the social, political, and environmental context which have institutional policies which may unfairly restrict the opportunities for particular groups of people to engage in preparedness activities (Henkel, Dovidio, & Gaertner, 2006). Most pertinent to this discussion may be the historical discrimination against minority groups which has produced a lasting disparity perpetuated by the policies that have different outcomes for minority race and ethnicities (Henkel et al., 2006).

Hypotheses

This study aims to investigate to what extent income status and race/ethnicity in old age interplay with disaster preparedness. Based on the literature review, this study suggests three hypotheses:

1. Lower income status negatively affects disaster preparedness.
2. Racial/ethnic minority elders are less likely to be prepared for disasters.
3. The associations between lower income status and disaster preparedness differ across racial/ethnic groups.

Methods

Data and Sample

Data used in this study were collected from the 2010 Health and Retirement Study (HRS). The HRS is a nationally representative panel survey of older adults in the United States aged 51 and older. The HRS utilizes a detailed design of the survey, and oversampling is prevalent among Black and Hispanic populations, and among residents of Florida. The HRS is publically available dataset and collection and production of HRS data comply with the requirements of the University of Michigan's Institutional Review Board (IRB). Also, the proposal of this paper as research using a secondary dataset was reviewed and approved by the University of New Hampshire's IRB. The sample in this study was restricted to respondents who completed a supplemental questionnaire regarding disaster preparedness, each respondent was randomly assigned to respond to this module. In order to examine racial/ethnic differences in disaster preparedness, this study dropped respondents whose race/ethnicity was categorized as "other" (less than 5% of our sample). The final sample included 1,711 respondents.

Measures

Dependent variable. *Disaster preparedness* was measured as a composite score of 13 Yes/No disaster preparedness questions, recoded as prepared (0) and not prepared (1). The range of overall preparedness was 0-13, 0 meaning not prepared and 13 meaning very prepared. These questions ask about whether or not the respondent is prepared for a disaster that may happen in their neighborhood. Disaster was defined, for the purpose of this study, as earthquake, fire, flood, or other natural or man-made disaster. The questions assessed disaster preparation activities and the respondent's engagement in preparation efforts (See Table 1). Cronbach's alpha was used to test the internal reliability of the disaster preparedness score (alpha = 0.60).

Key Independent Variables. This study compares three *racial/ethnic groups* including non-Hispanic White, non-Hispanic Black, and Hispanic. The Hispanic ethnic group consists of respondents who answered a separate Yes/No question regarding their Hispanic ethnicity. If respondents answered no, they were asked a separate question regarding their non-Hispanic race. To focus on economically vulnerable subgroups, we used the definition of *low income* from previous literature (Spillman, Biess, & MacDonald, 2012) to categorize the sample into two groups: Income higher than 300% of FPL was coded as non-low income (0), and below 300% of FPL as low income (1).

Covariates. This study included a number of sociodemographic covariates: *Education* was measured as a continuous variable in years of education, with a range from 1-17 years; 17 years of education is typical for college or graduate level of educational attainment. *Age* was measured by age groups; middle-aged (51-64 years = 1), young-old (65-74 years = 2), old-old (75-84 years = 3), oldest (85+ years = 4). *Gender* was indexed with dummy variables (male = 0, female = 1). *Living alone* was categorized into living alone and not living alone. *Functional limitation* was

assessed using a list of 5 activities of daily living (ADL) and 5 instrumental activities of daily living (IADL); each task was a Yes/No question and the range was 0-10; with 0 equaling no functional limitations and adding 1 point for each task that cannot be completed. ADL includes the five tasks bathing, dressing, eating, walking across a room, and getting in or out of bed, and IADL includes using a telephone, taking medication, handling money, shopping, and preparing meals.

Data Analysis

This study performed the analyses in two parts. First, bivariate analyses was done using chi-square and one-way ANOVA tests to determine differences in disaster preparedness across various sociodemographic groups. Second, Ordinary least squares (OLS) regression analyses was used to examine the main effects and the interaction effects of low income status and race/ethnicity on disaster preparedness.

$$Y = \alpha + \beta_1 \text{Low Income} + \beta_2 \text{Black} + \beta_3 \text{Hispanic} \dots + \varrho$$

$$Y = \alpha + \beta_1 \text{Low Income} + \beta_2 \text{Black} + \beta_3 \text{Hispanic} + \beta_4 \text{Low Income} * \text{Black} \\ + \beta_5 \text{Low Income} * \text{Hispanic} \dots + \varrho$$

Results

Descriptive results

Table 2 details the descriptive statistics for the total sample ($N = 1711$) as well as by income and race/ethnicity. Of the total sample, 47.17% were middle aged (51 to 64 years), 27.94% are young old (65 to 74 years), 19.52% were old old (75 to 84 years), and 5.38% were oldest (over 85 years). Females comprised 57.16% of the sample, and the average education was 12.70 years ($SD = 3.02$; range 1 to 17 years). The racial/ethnic composition of the sample was 67.91% White, 19.05% Black, and 13.03% Hispanic. Of the total sample, 24.90% lived alone

and the average number of functional limitations was 0.64 ($SD=1.55$; range 0 to 10). In addition, 47.75% of the sample live under 300% of the federal poverty line (FPL). The average preparedness score was 8.42 ($SD = 1.98$; range 1 to 13).

Across all covariates, clear patterns of association indicate that older low income and racial/ethnic minorities were most vulnerable. Overall, 44% of respondents considered low income identified as racial/ethnic minority. For low income respondents, the average education was 11.56 years ($SD = 3.36$) compared to 13.75 ($SD = 2.33$) years for non-low income. A higher proportion of low-income respondents lived alone (34%) and were female (62.30%). Low-income respondents were more likely to have increased functional limitations ($M = 0.93$, $SD = 1.86$) and a higher proportion were over age 65 (57.53%) compared to non-low income. Hispanic respondents had the lowest average preparedness score ($M = 7.66$, $SD = 2.15$).

In addition, clear patterns of association indicate Hispanic respondents were most vulnerable. Relative to White respondents, Hispanic respondents were most likely to have lower incomes (72.20%), have the lowest level of education among racial/ethnic groups ($M = 9.93$, $SD = 4.46$), and have more functional limitations ($M = 1.13$, $SD = 2.19$). When looking at the subsample of black respondents, approximately 61% lived below 300% of the FPL, the average education was 12.25 years ($SD = 2.54$), 31.90% lived alone, and the average function limitations was 0.89 ($SD = 1.83$).

Main Analysis

Table 3 shows the results of OLS analyses. When covariates were not controlled for, results indicated that Hispanic (Coef. = -0.696, $p < .001$; Model 1) and low income status (Coef. = -0.612, $p < .001$; Model 1) were associated with lower preparedness scores. Preparedness among Black elders was not significantly different from that among White elders. In addition,

Model 2 indicates low income status was still associated with lower preparedness scores, albeit with a decreased power of association, but still significant (Coef. = -0.318, $p < .01$; Model 2). However, black respondents had no significant change in preparedness. Therefore, racial/ethnic minority related to lower preparedness scores, but only for Hispanics.

Outside the focus of this research, Model 2 also presents some interesting findings related to the associations among socioeconomic status, health, and disaster preparedness. The oldest age group, over age 85 was associated with lower preparedness (Coef. = -0.740, $p < .001$; Model 2). Education was positively associated with preparedness (Coef. = 0.294, $p < .001$; Model 2) and functional limitations was negatively associated with preparedness (Coef. = -0.118, $p < .001$; Model 2). In addition, females were more likely to be prepared (Coef. = 0.294, $p < .01$; Model 2) and elders living alone were less prepared (Coef. = -0.264, $p < .05$; Model 2). There was no statistical difference between the middle-aged group and young-old group.

In Model 3, interaction terms between income and race/ethnicity were included to investigate the extent to which race/ethnicity moderates the main effect of income on disaster preparedness. Findings indicate that black negatively moderates the main effect of income. Although non-low income black elders were more prepared, low income black elders were less prepared (Coef. = -0.520, $p < .05$; Model 3). There was no interaction effects of low income and Hispanic found in our analyses.

Discussion

Using the nationally representative data, this study investigated to what extent and how race/ethnicity and income impact disaster preparedness in older adults. In addition, we examined if the associations between income and disaster preparedness differ depending on race/ethnicity.

This study adds to the limited body of literature on disaster preparedness in old age, and expands our knowledge on disparities in disaster preparedness.

Income has been considered a major factor in vulnerability for negative consequences of all-hazard disasters (Fothergill & Peek 2004). The negative and significant linkages between low-income and disaster preparedness in old age, however, have been limitedly documented. Consistent with previous studies (Blaikie et al., 1994), this study confirmed that low income older adults were less prepared for disasters compared to those considered non-low income even after controlling for all covariates, which supports the first hypothesis. Individuals with low income may prioritize their limited resources for their daily necessity not for disaster preparation (Fothergill & Peek, 2004; Frumkin, 2011; Peacock & Ragsdale, 1997). Also, low income people are more likely to live in poorer neighborhoods that cannot afford to help their residents be prepared for disasters (Finch et al., 2010; Murphy et al., 2009). Older adults tend to have lower income because many of them are fully retired or changed to part-time work as they get older. In our sample, approximately half of the respondents were categorized into low income (i.e., 300% of FPL). Considering the prevalence of low income status in old age, the significant association between low income and less disaster preparedness is critical among older adults, which should get policy attention.

Regarding race/ethnicity, the results of this study partially support the second hypothesis. Hispanic elders had lower preparedness scores when compared to White elders. This finding was not changed even after controlling for other covariates. However, interestingly, Black elders were not significantly different than white elders in their disaster preparedness scores. Race has been demonstrated to contribute to social vulnerability through the lack of access to resources, cultural differences, and the social, economic, and political marginalization (Satterfield, Mertz,

& Slovic, 2004; Ulbrich, Warheit, & Zimmerman, 1989). Also, ethnicity, mostly Hispanics, has been a clearly defined factor contributing to vulnerability (Cutter, Boruff, & Shirley, 2003). In post-disaster research, racial/ethnic minorities have been connected as a vulnerability for the negative impacts, possibly attributed to the stratification of access to disaster preparedness knowledge, resources, and materials (Bolin & Boltin, 1986). However, the results of this study only focusing older population found that only Hispanics were less prepared. Among older Hispanics, there may be imposed language and cultural barriers that affect access to pre-disaster preparedness programs, warnings, and post-disaster support (Carter-Pokras, Zambrana, & Mora, 2007; Eisenman, et al., 2009; Fothergill, Maestas & Darlington, 1999). Further studies should look into detailed mechanisms that link Hispanics with poor disaster preparedness.

Another interesting finding of this study is that the associations between income and disaster preparedness differed depending on race/ethnicity, which support the final hypothesis. Specifically, disaster preparedness among Black elders was significantly different between low income elders and non-income elders. In contrast, Hispanic elders were found to be vulnerable in disaster preparedness regardless their income status. There have been a number of studies that demonstrated low income Black individuals as the most vulnerable population in the United States in regard to disasters, and the disproportionate impact of the negative consequences of disaster on low-income black communities (Cutter, Boruff, & Shirley, 2003; Elder, Xirasagar, Miller, Bown, Glover, & Piper, 2007; Zakour & Harrell, 2008). This study confirmed that race/ethnicity and income combined contribute beyond other sociodemographic variables to the prediction of disaster preparedness.

Several study limitations warrant discussion. First, the prepared score was created based on 13 survey questions related to disaster preparedness, and the alpha coefficient for the 13 items

was 0.60. Cronbach's alpha is a measure of internal consistency, and shows how closely related a set of items are as a group. We understand that a reliability coefficient of 0.70 or higher is considered acceptable in most social science research, but some studies asserted that a Cronbach's alpha coefficient of 0.60 is also acceptable for internal consistency (Kehoe, 1995; Schmitt, 1996). Second, this study is based on a cross-sectional data, which cannot address potential reverse causality between income and disaster preparedness. Although this study found that low income is significantly associated with poor disaster preparedness, direction of causality cannot be determined only with cross-sectional data. Future studies looking at the long-term observations of disaster preparedness will offer more insight to clear cause and effect relationships between income and disaster preparedness.

This study identified subgroups of the older population who are most vulnerable for disaster preparedness. The findings from this paper supports social work efforts in effectively preparing individuals, families, social networks, neighborhoods, schools, organizations, and communities, particularly in areas where they may reach vulnerable populations (Major et al., 2015). Social workers could preemptively identify the differences between vulnerable sub-populations to offer different programs, distribution methods, and messaging to improve preparedness for a disaster (Eisenman et al., 2009). In addition, for individuals who cannot afford the cost of preparation, social workers could be involved with finding resources to offset the financial strain some vulnerable populations may face (Masozera et al., 2007). Social workers are also in the unique position to advocate for the needs of the disenfranchised to highlight existing inequities prior to the disaster (Fothergill & Peek, 2004). For example, individuals living in poverty could already be in crisis before a disaster occurs. Therefore, when disaster

strikes, social workers can understand how some individuals are impacted in different ways when compared to other populations (Fothergill & Peek, 2004).

This paper also has practice and research implications to further explore disaster preparedness for older populations across income and racial/ethnic groups. Reports indicated level of preparedness as a mitigating factor against the negative impact that disasters have on families. As this study demonstrated, income and race/ethnicity can be key factors in determining quality of preparedness, access to programs, and perceived ability to prepare. Lack of access to economic resources or knowledge can limit the ability of some age groups, socio-economic groups, and racial/ethnic groups to respond adequately to a disaster. Emergency management agencies with disaster-related responsibilities must tailor their programs and procedures to the needs of the most vulnerable populations. Further research should investigate the detailed barriers that racial/ethnic minorities and/or low income older adults encounter preparing for disasters.

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Table 1 Disaster Preparedness Score Survey Questions

Questions

Do you have a smoke or fire detector in your residence?

In the past few years, have you or other members of your household participated in any educational program such as a lecture or discussion, or read materials on how to prepare for disasters?

Has anyone either in your household or someone close to you prepared a specific plan written or otherwise on what to do in case of a disaster, such as a fire, flood, tornado or earthquake?

Do you know the specific location of a shelter in your community in case you have to leave your residence in a disaster?

Suppose a disaster occurred, and water, electricity, heat and air conditioning were not available. Do you have a set of supplies or a kit in your residence that could supply food, water and medical treatments so you could live in your home for at least three days?

Are you or other members of your household registered with any community program or medical or other organization that would offer help to you in the event of a disaster?

Are you aware of any program or organized community organization that works to help prepare people for the possibility of disasters?

If there were no power or telephones, would you have a way to receive communications about disasters in your residence, such as with a battery-operated radio?

If there were a fire in your residence, could you and each of the other members of your household exit the building immediately -- that is, within 30 seconds -- without the help of another person?

In the event of a disaster, if the main entrance door to your building were blocked, is there another way for you to exit your residence immediately?

Are there persons whom you know who live within 50 miles of your residence, who would help you and provide transportation and shelter in the event of a disaster that prevented you from living in your house?

Has a doctor or other health professional talked to you about what to in the event of a natural disaster?

Does a hearing impairment make it difficult for you to hear warning sirens while you are in your house?

Table 2 Sample Characteristics by Income Status and Race/Ethnicity

| | Total (<i>N</i> = 1711) % or M(SD) | Low Income (<i>n</i> = 817) % or M(SD) | Non Low Income (<i>n</i> = 894) % or M(SD) | Statistics | Non- Hispanic White (<i>n</i> = 1162) % or M(SD) | Non- Hispanic Black (<i>n</i> = 326) % or M(SD) | Hispanic (<i>n</i> = 223) % or M(SD) | Statistics |
|---------------------------|--|---|--|----------------------------|---|--|---|----------------------------|
| Age Groups | | | | $\chi^2(3) = 23.38^{***}$ | | | | $\chi^2(6) = 80.59^{***}$ |
| Middle Aged | 47.17% | 42.47% | 51.45% | | 40.02% | 61.35% | 63.68% | |
| Young Old | 27.94% | 28.03% | 27.85% | | 30.29% | 23.93% | 21.52% | |
| Old-Old | 19.52% | 22.28% | 17.00% | | 23.32% | 11.04% | 12.11% | |
| Oldest | 5.38% | 7.22% | 3.69% | | 6.37% | 3.68% | 2.69% | |
| Female | 57.16% | 62.30% | 52.46% | $\chi^2(1) = 16.88^{***}$ | 56.11% | 58.59% | 60.54% | $\chi^2(2) = 1.83$ |
| Low Income (<FPL 300%) | 47.75% | 100% | 0% | N/A | 39.24% | 61.35% | 72.20% | $\chi^2(2) = 111.30^{***}$ |
| Race/Ethnicity | | | | $\chi^2(2) = 111.30^{***}$ | | | | N/A |
| Non-Hispanic White | 67.91% | 55.81% | 78.97% | | 100.00% | 0.00% | 0.00% | |
| Non-Hispanic Black | 19.05% | 24.48% | 14.09% | | 0.00% | 100.00% | 0.00% | |
| Hispanic | 13.03% | 19.71% | 6.94% | | 0.00% | 0.00% | 100.00% | |
| Disaster Preparedness | 8.42 (1.98) | 8.06 (2.06) | 8.76 (1.85) | $F(1,1709) = 53.90^{***}$ | 8.55 (1.86) | 8.49 (2.14) | 7.66 (2.15) | $F(1,1708) = 19.93^{***}$ |
| Education | 12.70 (3.02) | 11.56 (3.36) | 13.75 (2.33) | $F(1,1703) = 255.42^{***}$ | 13.36 (2.43) | 12.25 (2.54) | 9.93 (4.46) | $F(1,1702) = 144.35^{***}$ |
| Living Alone | 24.90% | 34.03% | 16.55% | $\chi^2(1) = 69.69^{***}$ | 24.53% | 31.90% | 16.59% | $\chi^2(2) = 16.87^{***}$ |
| Functional Limitations | 0.64 (1.55) | 0.93 (1.86) | 0.36 (1.12) | $F(1,1709) = 59.83^{***}$ | 0.47 (1.25) | 0.89 (1.83) | 1.13 (2.19) | $F(2,1708) = 23.02^{***}$ |

****p* < .001

□

Table 3 Ordinary Least Squares Regression of Disaster Preparedness: Main and Interaction Effects

| DV=Preparedness | Model 1 β | Model 2 β | Model 3 β |
|----------------------------|--------------------|--------------------|--------------------|
| Age Groups† | | | |
| Young Old (65-74 years) | | -0.069 | -0.809 |
| Old Old (75-84 years) | | -0.375* | -0.391** |
| Oldest (85+ years) | | -0.740*** | -0.778*** |
| Education | | 0.083*** | 0.795*** |
| Female | | 0.294** | 0.289** |
| Functional Limitations | | -0.118*** | -0.113*** |
| Living Alone | | -0.264* | -0.263* |
| Low Income‡ | | | |
| FPL < 300% | -0.612*** | -0.318** | -0.174 |
| Race‡ | | | |
| Non- Hispanic Black | 0.077 | 0.957 | 0.373* |
| Hispanic | -0.696*** | -0.548*** | -0.300 |
| Interactions | | | |
| Black * Low Income | | | -0.520* |
| Hispanic * Low Income | | | -0.440 |
| Cons | 8.793*** | 7.675*** | 7.679*** |
| R ² | 0.045*** | 0.091*** | 0.094*** |
| N | 1711 | 1705 | 1705 |

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; † Reference groups: Age Groups: Middle Age 51-64 years; Low Income: FPL \geq 300%; Race: Non-Hispanic White.