Background
There is a continuing need to assess the availability of social capital among certain sub-populations to improve our understanding of how these ties and connections promote access to resources important to disaster preparedness and evacuation decision-making. The Gulf Coast of Florida was hard hit by two strong storms in two years. Hurricane Irma in 2017 caused widespread destruction in the Florida Keys before impacting the Tampa Bay region. In 2018 Hurricane Michael caused catastrophic damage to property and resulted in the loss of lives as it made landfall in the Florida Panhandle. This study engaged adult residents in public housing in Tampa, Florida to understand the role of social networks in preparedness planning and evacuation decision-making. Surveys were conducted to measure the density, dependability and diversity of social networks and their value in disaster preparedness.

As the Federal Emergency Management Agency (FEMA) requires everyone to do more with less, and to promote self-reliance, this project explored the utility of social networks among residents in public housing to aid in disaster preparedness and evacuation. Hurricane Irma made landfall in Florida in 2017, impacting the Tampa Bay area. The storm left behind significant damage to property and personal belongings. Residents in public housing are considered a sub-population that tends to become “hidden” in the emergency preparedness literature. Research in this area is still emerging, and one untapped area is knowledge about the role social connections played in preparedness and evacuation decisions during Hurricane Irma. Residents in affected public housing developments were ordered to evacuate despite potential barriers stemming from social, economic and other factors. Results from this study were intended to aid Tampa Housing Authority leaders and those in local emergency management to examine policies and practices to promote the use of strong social connections in disaster planning and evacuation decision-making.

Objective and Research Hypotheses
The key objective of this study was to explore the relationships among the density, diversity and dependability of social networks in relation to hurricane disaster planning and evacuation.

We hypothesize:
- More dense networks (number of connections) provide increased resources to prepare and evacuate for a natural disaster.
• More diverse networks (types of connections) provide increased resources to prepare and evacuate for a natural disaster.
• More dependable networks (reliable connections) provide increased resources to prepare and evacuate for a natural disaster.

**Study Design**

This cross sectional study used a quantitative survey design. An 18 item survey was administered face-to-face to a sample of public housing residents across four locations in Tampa, Florida. The researcher recorded all responses provided by each participant. The survey took approximately 20 minutes to complete. Questions on the survey addressed the density, diversity and dependability of social connections and how these social ties generate resources that aid in hurricane preparedness and evacuation. A few questions directly ask about the experience of Hurricane Irma which impacted the community in 2017.

**Sample size:** Total sample size was 90 adult residents living in public housing managed by the Tampa Housing Authority (THA) since at least 2017. This group was recruited using convenience sampling. THA distributed flyers provided by the researchers to announce the study to residents. Surveys were administered on-site at public housing developments identified by THA management. These sites were recognized as being geographically located within county hurricane evacuation zones. Participation in the study was voluntary and participants were provided a $5 gift card to a local supermarket as an incentive for their time to complete the survey.

**Inclusion/Exclusion criteria:** The primary focus of this study was adults residing in THA public housing since at least 2017. The following criteria were used to determine whether a potential participant was eligible for the study:

• **Inclusion criteria:** Individuals age 18 years of age or older currently living in public housing managed by THA. Individual should have lived in their residence during Hurricane Irma in 2017. Individuals must have some comprehension of English.

• **Exclusion criteria:** Individuals under the age of 18 years. Individuals who did not currently live in THA public housing and/or did not live in this housing during Hurricane Irma in 2017. Individuals who do not comprehend English.

**Sites:** Four public housing sites were identified by the researcher and THA leadership. Each location was geographically situated within a declared county hurricane evacuation zone in Tampa, Florida. The public housing developments comprised individual and family units. One location was designated for seniors and individuals with disabilities.

• Arbors at Rubin Padgett Estate
• Bay Ceia
• Gardens at SouthBay
Human subjects protection: The study was approved as minimal risk by the University of South Florida (USF) Institutional Research Board (IRB). A waiver of documented consent was also approved as the participant’s signature would be the only item to connect data to specific individuals. We were deliberate to not collect any personally identifying information in this study. We believed this was important since the sample population resides within a government managed housing authority and some residents may feel uncomfortable participating if they believed someone might connect their responses. All participants were fully consented using approved IRB forms, however, we did not seek a signature. Instead, the researcher acknowledged that consent was given and that participation was voluntary. Also, all data was presented in aggregated form after analysis.

Instrument: An 18 item survey was developed for this study to assess social connections and access to resources resulting from these social ties which influenced disaster preparedness planning and evacuation during Hurricane Irma. Questions were asked within the following topics:

- Household composition and ties to the local community (e.g. number of people residing in household, seniors and children in household, tenure in house, involvement in social organizations within the local community, etc)
- Experience with hurricane preparedness and evacuation (e.g. evacuation for Hurricane Irma, previous evacuation experiences, disability restrictions in evacuation, etc)
- Resources depended on in the event of a hurricane (e.g. Would you depend on family, friends, neighbors, co-workers, government, organizations, etc if you needed help with finances, sheltering, emotional support, repairs to home)
- Frequency of being in touch with family and friends
- Perceptions of quality of life in the local community
- Perceptions of social connections
- Demographic information
- Open ended-question for general comments

Analysis: Quantitative data were analyzed using a statistical software package (SPSS) to reveal descriptive statistics and basic associations between variables. Thematic analysis was used to code and reveal results from the single open-ended question in the survey.

Results
This preliminary technical report provides a summary of some key findings from the analysis of survey data.
With regard to the role a disability might play in relying on social connections for hurricane preparedness and evacuation, preliminary results found, 40% of the sample (n=36) acknowledged having a disability. Of this subset, 60% (n=22) reported a mobile disability, 16% (n=7) had a vision disability, 9% (n=4) had a hearing disability and 7% (n=3) had a cognitive disability.

Among these 36 individuals with disabilities, they reported using their social connections to communicate most frequently with neighbors and close family members within the county. Specifically, when asked whom they could depend on for emotional support in a hurricane, 20% (n=8) said they could rely on close relatives living in Hillsborough County. In contrast, when asked about seeking shelter during a hurricane, financial help, or repairs after a hurricane, a majority of individuals relied most heavily on the government for help. Only in the event of temporary housing after a hurricane were the responses relatively equal between family in the county and the government.

With regard to the role gender and race/ethnicity might play in relying on social connections for hurricane preparedness, preliminary results suggest differences for women of color. Specifically, African American and Latino women tended to have more social interactions than white women. Also, if there were a hurricane in the near future, these participants would either rely on the government or family in Hillsborough County. It was also found that the most common action among women across all races/ethnicities during Hurricane Irma was to stay at home (shelter in place) or shelter within the local area rather than evacuating. These results suggest many women in public housing either do not have enough social connections to leave their area, do not have the means to leave, or have a need for governmental assistance.

With regard to the influence of social connections on the decision to evacuate, preliminary results found 37% of participants have no friends or family that they could stay with during a hurricane. In comparison, 47% would stay with friends and family less than 50 miles away. Residents in public housing seem to be socially interconnected with 61% reporting they talk with their neighbors about once per day. Over two-thirds (79%) are also attached to the local community indicating they would prefer to stay in the community rather than evacuate.

**Limitations**

Three limitations related to the sample were identified as possibly skewing the data. The age of the sample revealed a majority of participants were considered to be elderly. This may have been a result of one of the housing developments established to serve a senior population. The gender of the sample revealed 77% of participants to be female. Finally, the race of the sample had only 11.5% of the sample identified as
white. We attribute these demographic limitations to the use of convenience of sampling. Future research should consider a sampling method to provide more diversity among the participants.

Although not a significant limitation, language did become a consideration during the administration of surveys. Some participants had limited comfort in speaking English. We did have several research team members who were fluent in Spanish and therefore, were able to give the survey in that language. Future consideration should be given to developing a Spanish language version of the survey to improve the comfort level of participants in responding to questions.

**Conclusion and Recommendations**

The preliminary findings of this study suggest that public housing residents with disabilities are limited in terms of their social connections with family and friends. Instead, a majority of individuals seem to rely heavily on government resources for help in the event of a hurricane. This may make sense as they are likely provided with information and resources for public programs designed to support those with limited means and fixed incomes. This may carry over into needing similar public supports in the event of a hurricane. For those experiencing a disability, it would be important to establish more diverse and dependable support systems seeing as they encounter more obstacles as they attempt to prepare for and respond to a natural disaster. Likewise, future research should aim to discover what people with disabilities find most difficult in coping with a hurricane, and what public housing or the government can do to better facilitate their preparation and evacuation.

Family members nearby were perceived as a positive social tie for emotional support, however, individuals in this study believed their strongest social connections were with neighbors. This is particularly important when participants with disabilities report evacuation being difficult. Likewise, an overwhelming number of women chose to shelter at home during Hurricane Irma rather than evacuate. This suggests the comfort residents have with their neighbors to feel safe riding out a storm at home. With this in mind, it may be important for THA to ensure generators are available to address any disruption to power. This is particularly important for those needing to keep medications such as insulin, refrigerated, or those requiring power for medical devices. It is also important for THA to ensure an effective communication system to pass along storm related information to residents sheltering in place. Finally, THA should consider an effective and efficient transportation plan in case conditions deteriorate to the extent that residents must be physically evacuated to special needs medical shelters.