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Introduction

The Gulf States, comprising Alabama, Louisiana, Mississippi, Texas, and Florida, are geographically vulnerable to a variety of natural disasters, ranging from hurricanes and coastal flooding to earthquakes, and wildfires. Disasters in the Gulf States pose significant risks to property and human life, necessitating effective preparedness measures at the household level. These states have experienced numerous catastrophic events in recent decades, underscoring the importance of effective disaster preparedness and response measures. However, the extent to which socioeconomic factors influence households' preparedness for disasters remains understudied, particularly in the context of the Gulf States region. Among the factors influencing disaster preparedness, the level of insurance coverage, particularly homeowners and renter's insurance, plays a crucial role in determining the ability of individuals and communities to recover from disaster-related losses. This study aims to examine the relationship between income, level of education, age, disability, and households' preparedness for disasters, utilizing spatial analysis techniques to elucidate spatial patterns and disparities across the Gulf States.

Methodology

To answer the question, **“to what extent do income, level of education, age, and disability affect households' preparedness for disasters in the Gulf States, and what spatial patterns and disparities emerge across the region?”**

A sample of 1900 respondents was drawn from FEMA's 2023 National Household Survey, ensuring representation across the Gulf States region. Data on median income, level of education (proportion of individuals aged 25 and above with a high school diploma or higher), age distribution (individuals aged 18 and older), and disability prevalence were obtained from the American Community Survey (ACS), spanning from 2017 to 2022 and conducted by the U.S. Census Bureau. The disaster preparedness indicator, insurance coverage, was also derived from FEMA's survey.

The geographic locations of respondents were geocoded based on ZIP codes. These data were then spatially joined with county boundary files to aggregate individual-level data. GIS techniques were employed to create choropleth maps, visualizing spatial patterns of disaster preparedness indicators and socioeconomic variables at the county level. Graduated color schemes were used to represent variations in preparedness levels and socioeconomic characteristics across the Gulf States.

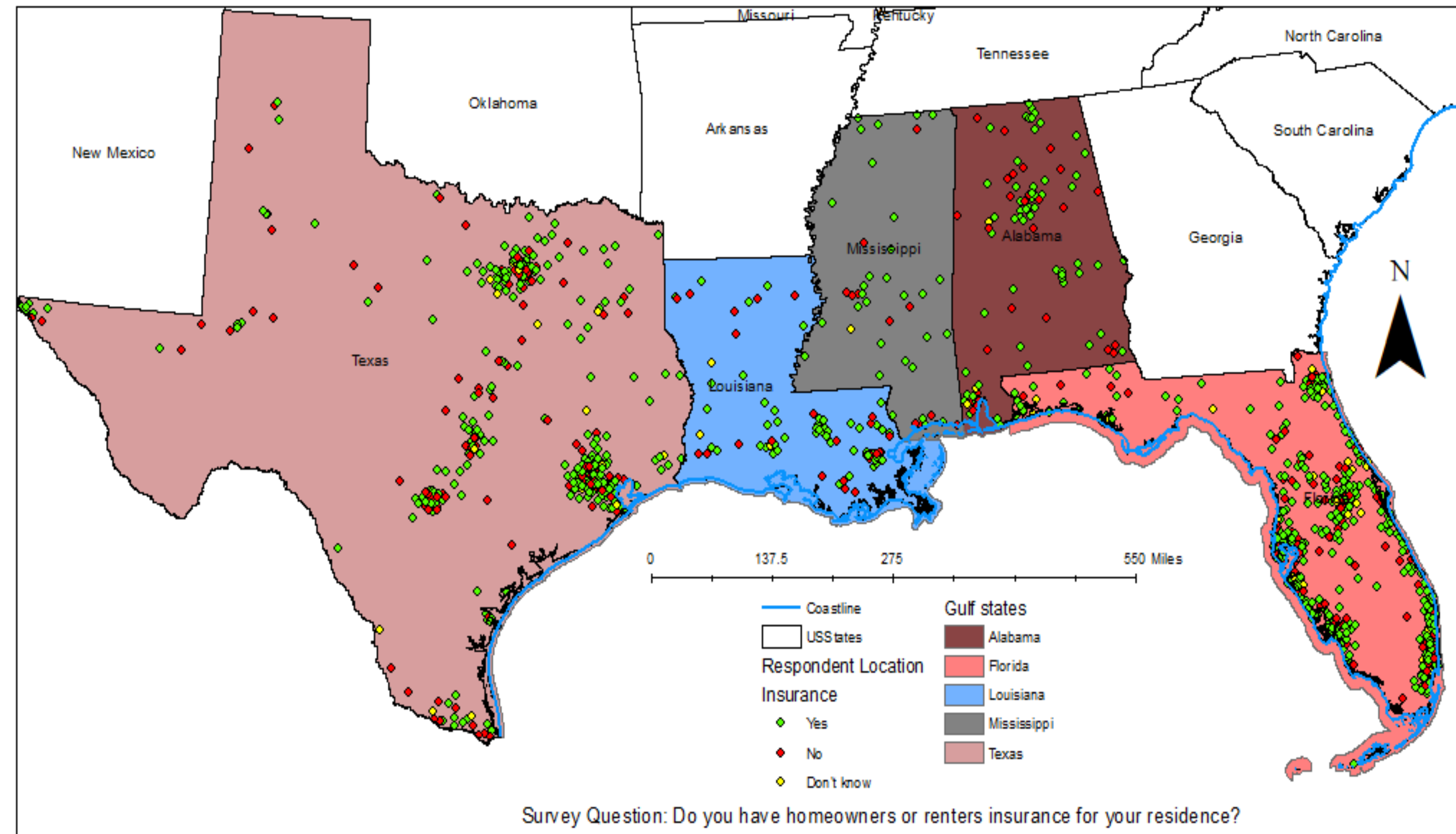


Figure 1 provides a geographical context for the study. It shows the Gulf Coast states (Alabama, Louisiana, Mississippi, Texas, and Florida) and the locations where survey respondents are situated. This allows us to visualize the distribution of data across the region.

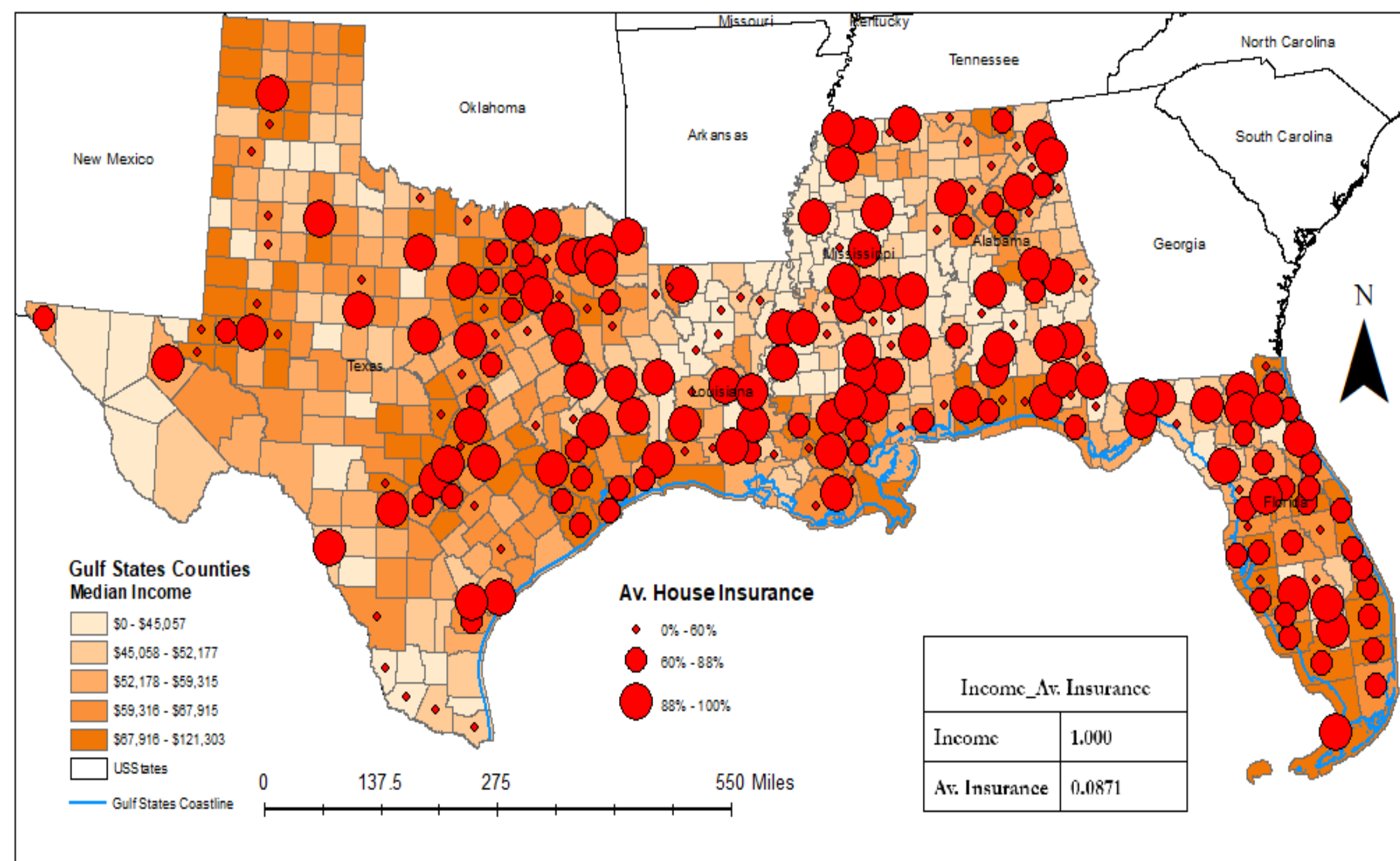


Figure 2 showing the correlation between median income and disaster preparedness

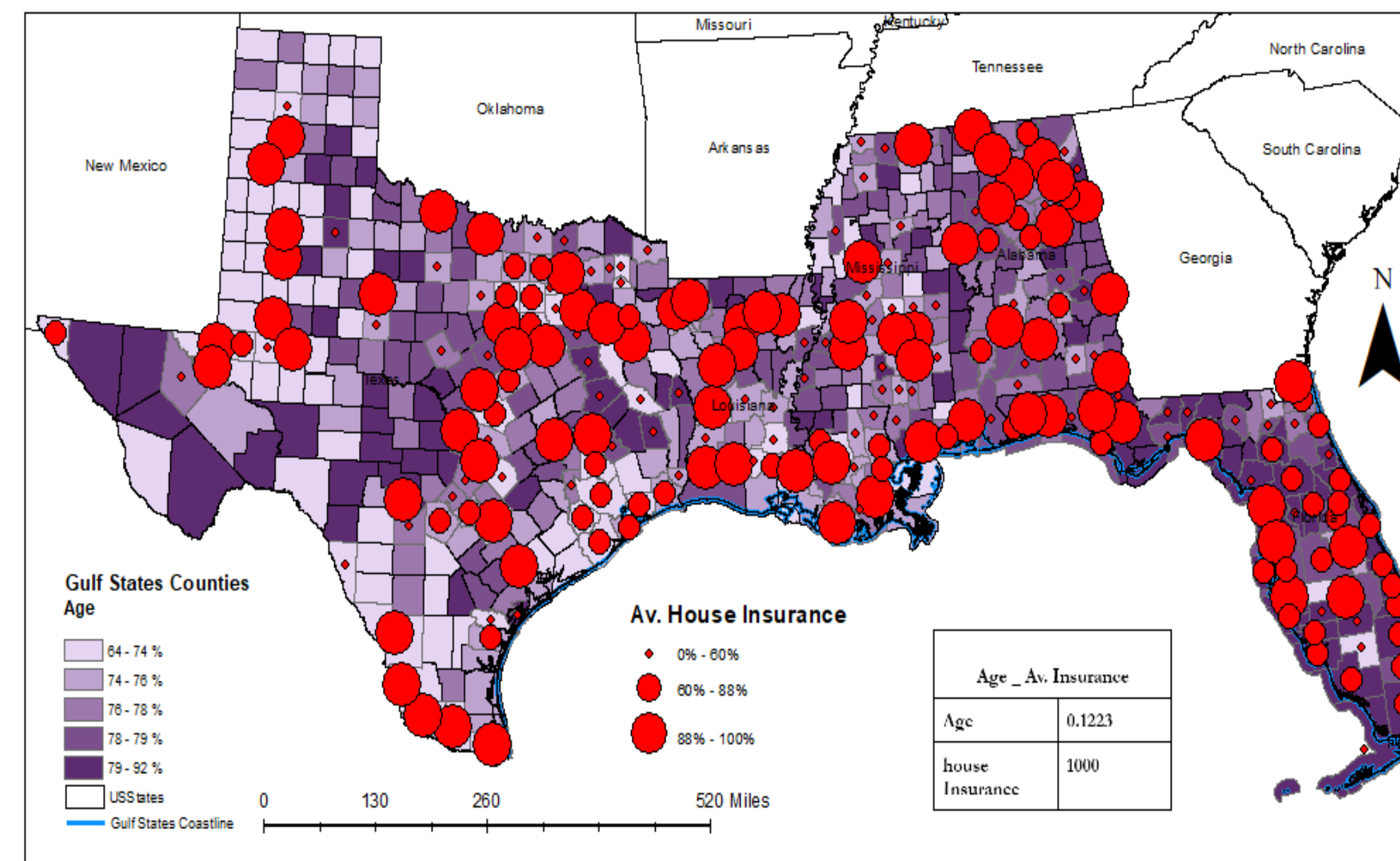


Figure 3 showing the correlation between age of the population and disaster preparedness

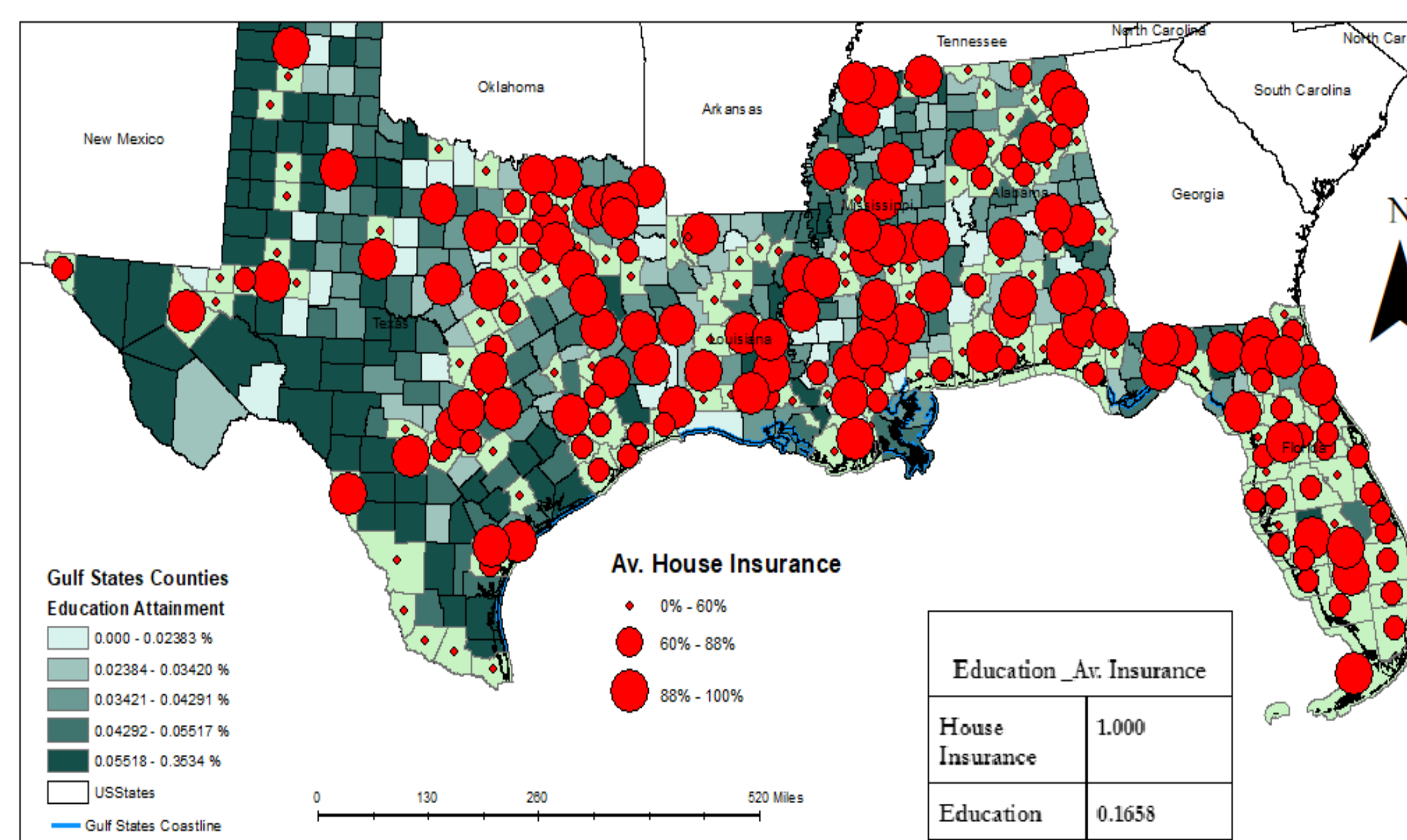


Figure 4 showing the correlation between individuals with higher educational attainment and disaster preparedness

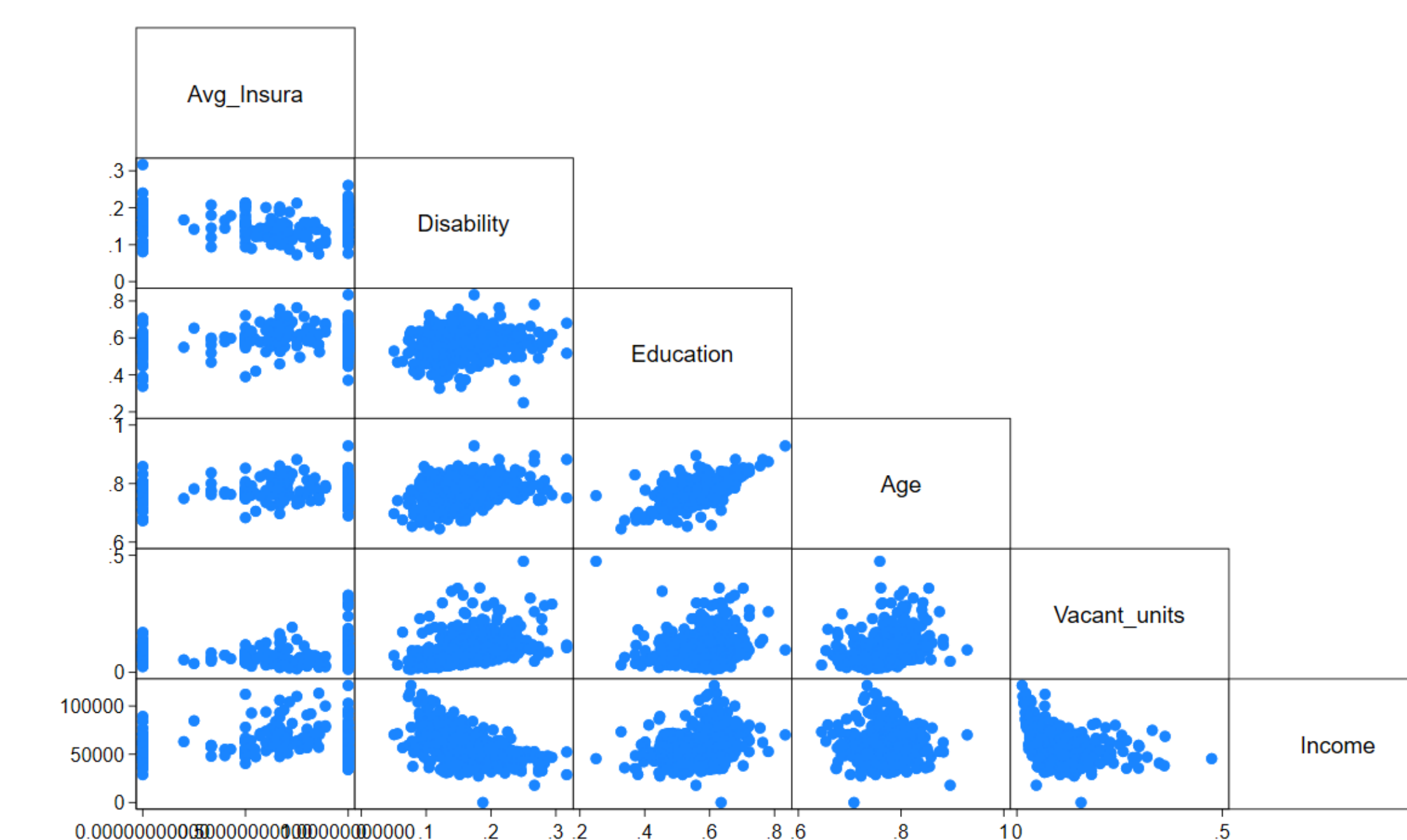


Figure 5 showing the scatter plot matrix of socioeconomic variables and disaster preparedness

Findings

Age, education, and median income show positive correlations with home insurance coverage with varying significance levels. Older individuals, higher education levels, and higher income brackets tend to have slightly higher insurance coverage rates. Disparities persist among demographic groups and socioeconomic strata, with vulnerable populations facing barriers to insurance access. Low-income households, individuals with lower education levels, and older adults are particularly vulnerable to disaster-related losses. These findings underscore the multifaceted nature of disaster preparedness and emphasize the importance of socioeconomic considerations in resilience-building efforts in the Gulf States region.

Limitations

Disaster preparedness is multifaceted, and while home insurance coverage is one indicator, it doesn't capture all preparedness behaviors. The findings are specific to the Gulf States and may not apply universally due to unique socio-economic and geographic characteristics. Other relevant variables like race, ethnicity, household composition, and social capital were not examined, potentially impacting preparedness outcomes but not explicitly examined.

Conclusions

Despite limitations, this study enhances our understanding of household disaster preparedness in the Gulf States by emphasizing the impact of socioeconomic factors. Insights into the relationships between age, education, income, and insurance coverage offer valuable guidance for policymakers, emergency managers, and stakeholders. Targeted interventions, including improved access to insurance coverage and community-based preparedness initiatives, can address disparities and bolster resilience in vulnerable communities. By considering the interplay of socioeconomic factors, policymakers can develop more effective strategies to mitigate the impacts of disasters in the Gulf States region.

Sources

Federal Emergency Management Agency (FEMA). (2023). National Household Survey on Disaster Preparedness. Retrieved March 26, 2024, from <https://www.fema.gov/about/openfema/datasets/national-household-survey>

U.S. Census Bureau. American Community Survey. 5-year estimates. Accessed April 16, 2024. Retrieved from <https://data.census.gov/table>