Title: Maps Ranking of Household Composition and Minority Status/Language SVI in Arizona Tracts

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Overview

The Center of Disease Control (CDC) Social Vulnerability Index (SVI) is a measure of the relative vulnerability of populations to the impact of environmental hazards such as natural disasters or infectious disease outbreaks. We will explore the relationship between *Household SVI and Racial/Minority SVI* using geographic information system (GIS) tools from the Arizona Department of Health Services (ADHS) annual SVI calculations. ASHS annual SVI is derived as a replicate method of every two year CDC SVI calculations. The ADHS SVI data is published on the AZGeo data platform (https://azgeo-open-data-agic.hub.arcgis.com/) supported by the Arizona Geographic Information Council (AGIC) and Arizona State Land Department.

Household Characteristics and SVI

Household characteristics and disability is a strong predictor of vulnerability to environmental hazards. The SVI variables and calculation methodology are listed below.

RPL_THEME2: Household Composition & Disability

1. Percent single-parent households (PSNGPNT)
2. Percent households with persons aged 65 and over (PH65UP)
3. Percent households with persons aged 17 and under and living below poverty (PHU18P)

Formula for RPL_THEME2:

1. Assign a standardized score (z-score) to each of the three variables using the mean and standard deviation of the variable at the national level.
2. Average the three standardized scores to get the household composition & disability composite score.
3. Rank each census tract's composite score from highest to lowest.
4. Divide the rank of each census tract by the total number of census tracts in the county to get the percentile rank.
5. Multiply the percentile rank by 100 to get the final RPL_THEME2 value.

Minority Status/Language and SVI

Minority Status & Language is a strong predictor of vulnerability to environmental hazards. The SVI variables and calculation methodology are listed below.

RPL_THEME3: Minority Status & Language

1. Percent minority (PMINORITY)
2. Percent households where no one over age 14 speaks English only or speaks English "very well" (PNOENGL)

Formula for RPL_THEME3:

1. Assign a standardized score (z-score) to each of the two variables using the mean and standard deviation of the variable at the national level.
2. Average the two standardized scores to get the minority status & language composite score.
3. Rank each census tract's composite score from highest to lowest.
4. Divide the rank of each census tract by the total number of census tracts in the county to get the percentile rank.
5. Multiply the percentile rank by 100 to get the final RPL_THEME3 value.

Mapping Household Characteristics and Racial and Minority Status with SVI

While both household characteristics and racial and minority status are important predictors of vulnerability to environmental hazards, they are not necessarily interchangeable.   The map visualizations show differences demonstrating that aggregating the two measurements may lead to inaccurate assumptions.   In Arizona, these two indices may be used to identify communities that are particularly vulnerable to different types of hazards or disasters. For example, areas with high scores on the Household Composition SVI may have a higher proportion of households with limited resources and may be more vulnerable to hazards that disrupt services and support systems. On the other hand, areas with high scores on the Minority Status SVI may have a higher proportion of minority residents who face additional social, economic, and cultural barriers that could affect their ability to prepare for and respond to disasters.