CDC/ATSDR Social Vulnerability Index (SVI) Academic Toolkit: RStudio Exercise Overview

The SVI is a place-based index, database, and mapping tool that helps users identify and characterize communities that need support to prepare for, respond to, and recover from public health crises.

place matters. GRASP

Technical Details and Version Information:

The SVI RStudio Exercises were created in the R and RStudio Versions described below:
- R Version: 4.3.1, released June 16, 2023, nickname: "Beagle Scouts" for Windows
- RStudio Version: 583b465e, released 2023-06-05, Nickname: "Mountain Hydrangea" for Windows

R and RStudio Installation Details: Using the [Comprehensive R Archive Network (CRAN) Link](#), download software according to your system operating system. Install R, followed by RStudio on your computer.

R and RStudio Instructional Guide: CRAN provides a free [instructional guide](#) on how to use R. Additionally, use Stack Overflow or Google as needed for additional support with troubleshooting and learning the platform. For example, if you receive an error message, copy and paste the error message into Google or Stack Overflow for potential solutions.

Toolkit Item	Learning Objectives
RStudio SVI Exercise 1	• Introduce loading spatial data into RStudio and learn how to use the "tmap" R package to create formatted SVI maps for the trainee's state and county of interest.
RStudio SVI Exercise 2	• Run basic spatial models to address a spatial epidemiology research question. • Introduce quantifying spatial autocorrelation using the "spdep" R Package. • Create maps that show spatial autocorrelation with respect to the SVI.

GRASP

CDC ATSDR

CDC/ATSDR Social Vulnerability Index (SVI): Analytic File Information

The SVI is a place-based index, database, and mapping tool that helps users identify and characterize communities that need support to prepare for, respond to, and recover from public health crises.

place matters. GRASP

Analytic File Data Dictionary: The table below features a data dictionary describing the data included in the analytic file provided for the SVI RStudio Exercises. The same analytic file can be used for each of the exercises. SVI 2020 estimates were downloaded in file geodatabase format from the CDC SVI website. Crude depression prevalence estimates were downloaded from the CDC PLACES website. The data were merged in R. Variables including place name, state name, state abbreviation, SVI theme, overall SVI score, and depression prevalence percentage were retained in the final file.

Variable Name	Description
FIPS	Federal Information Processing series (FIPS) code that is 11 digits long, and unique to each census tract.
STATE	Text name of the state the census tract is found in.
ST_ABBR	Two-letter postal code of the state the census tract is found in.
COUNTY	Text name of the county the census tract is found in.
LOCATION	Full name of census tract, including census tract number, county name, and state name.
depression	Crude depression prevalence, displayed as percentage rounded to the nearest tenth of a percent, from PLACES data.
svi_theme1	Percentile rank of SVI theme 1: Socioeconomic status. Values range from 0 to 1. Higher values indicate more vulnerability within the corresponding theme.
svi_theme2	Percentile rank of SVI theme 2: Household characteristic. Values range from 0 to 1. Higher values indicate more vulnerability within the corresponding theme.
svi_theme3	Percentile rank of SVI theme 3: Racial and ethnic minority status. Values range from 0 to 1. Higher values indicate more vulnerability within the corresponding theme.
svi_theme4	Percentile rank of SVI theme 4: Housing type and transportation. Values range from 0 to 1. Higher values indicate more vulnerability within the corresponding theme.
svi_overall	Percentile rank of the overall SVI score. Values range from 0 to 1. Higher values indicate more vulnerability overall.
geometry	A field that tells R about the location of the corresponding census tract relative to other census tracts in the dataset.

Geospatial Research, Analysis & Services Program (GRASP)
Office of Innovation and Analytics
Agency for Toxic Substances and Disease Registry (ATSDR)

GRASP

CDC ATSDR