

Identifying Vulnerable Rural Populations During COVID-19: The CDC’s Social Vulnerability Index

Overview

Social vulnerability refers to a community’s capacity to prepare for and respond to the stress of hazardous events — including natural disasters and pandemics. The Centers for Disease Control and Prevention (CDC) has created a multifactor [Social Vulnerability Index](#) (SVI) which can be used to identify vulnerable rural populations at greatest risk of impact by hazardous events. The SVI is calculated at two levels — one set of variables for all US counties and a second set for all US census tracts — and updated bi-annually.

The SVI can be useful in planning efforts to prevent and respond to COVID-19 infections in local communities. The [NOSORH COVID-19 Data Tool](#) includes the latest SVI data displayed in a visual format. Overlaying the SVI data layers with other available layers aids in the identification of high need areas, assisting in delivery of resources where they are most needed.

What’s in the SVI

The SVI incorporates the most recent Census data, grouping 15 variables into four distinct themes. The four themes include:

- **Socioeconomic status.**
- **Household composition and disability.**
- **Minority status and language.**
- **Housing type and transportation.**

The 15 variables are used to create a score for each theme, which combine to create a [composite overall vulnerability](#). Table 1 shows how each variable is grouped into the four themes.

Each variable, each theme, and the composite SVI is [assigned a score between 1 and 0](#) representing the relative risk of a given county or census tract compared to all others in the nation. A score of 1 would indicate that a county/census tract is in the

Table 1. Variables Used in the CDC SVI

Overall Vulnerability	Socioeconomic Status	Below Poverty
		Unemployment
		Income
		No High School Diploma
	Household Composition & Disability	Aged 65 or Older
		Aged 17 or Younger
		Older than Age 5 with a Disability
		Single Parent Household
	Minority Status & Language	Minority
		Speaks English “Less than Well”
	Housing Type & Transportation	Multi-Unit Structures
		Mobile Homes
		Crowding
		No Vehicle
		Group Quarters

American Community Survey (ACS), 2014-2018 (5-year) data for the estimates above.

most vulnerable percentile of all counties or census tracts in the nation. A score of 0 would indicate that a county is in the least vulnerable percentile of all counties or census tracts in the nation. A score of .75 or higher would indicate that a county/census tract is in the most vulnerable quartile of counties or census tracts in the nation.

Using the SVI to identify populations with high risk for spread of COVID-19

Variables in the Housing Type and Transportation theme are **indicators of risk associated with residences and travel**. These are social determinant variables which are of particular use for mapping areas with high risk for community spread of COVID-19. The overall theme score can be used as a good proxy for these risks, but examination of individual variables may provide greater insight. These variables can indicate where special prevention efforts could be targeted.

No Vehicle: The 'no-vehicle' variable in this theme can indicate the relative risk of infection spread in car pools and shared transportation. In rural areas residents **often travel longer distances** during their commute, leading to a large number of car pools and ride sharing. Social distancing is difficult in shared transportation. A county/census tract with a high score on this variable will be at higher risk for COVID-19 contagion during routine travel.

Note that the CDC has flagged this as an important issue in safely reopening workplaces. **Guidance** recognizes that efforts to reduce infection in the workplace will be meaningless if employees get sick while commuting, urging employers to address this social determinant.

Crowding: Overcrowding in housing units **increases the opportunity for contagion** between residents, and is a particular concern for multi-generational

CDC's SVI Factsheet

CDC's Social Vulnerability Index (SVI)
A tool to identify socially vulnerable communities **GRASP**

CDC's SVI
What is social vulnerability?
Every community must prepare for and respond to hazardous events, whether a natural disaster like a tornado or disease outbreak, or a human-made event such as a harmful chemical spill. A number of factors, including poverty, lack of access to transportation, and crowded housing may weaken a community's ability to prevent human suffering and financial loss in a disaster. These factors are known as **social vulnerability**.

What is CDC's Social Vulnerability Index?
ATSDR's Geospatial Research, Analysis & Services Program (GRASP) created databases to help emergency response planners and public health officials identify and map communities that will most likely need support before, during, and after a hazardous event.

CDC's SVI uses U.S. Census data to determine the social vulnerability of every census tract. Census tracts are subdivisions of counties for which the Census collects statistical data. The SVI ranks each tract on 15 social factors, including poverty, lack of vehicle access, and crowded housing, and groups them into four related themes. Maps of the four themes are shown in the figure below. Each tract receives a separate ranking for each of the four themes, as well as an overall ranking.

How can CDC's SVI help communities be better prepared?
The SVI can help public health officials and local planners better prepare for and respond to emergency events like hurricanes, disease outbreaks, or exposure to dangerous chemicals.

CDC's SVI databases and maps can be used to:

- Estimate the amount of needed supplies like food, water, medicine, and bedding.
- Help decide how many emergency personnel are required to assist people.
- Identify areas in need of emergency shelters.
- Plan the best way to evacuate people, accounting for those who have special needs, such as people without vehicles, the elderly, or people who do not understand English well.
- Identify communities that will need extra funding and support before, during, and after a disaster.

Maps show the range of vulnerability in Gwinnett County, Georgia for the four themes.

For more information, please contact CDC's SVI Coordinator (svi_coordinator@cdc.gov) or visit <http://svi.cdc.gov>.

Geospatial Research, Analysis, and Services Program (GRASP)
Division of Toxicology and Human Health Sciences, ATSDR **GRASP**

CDC **ATSDR**
Centers for Disease Control and Prevention
Agency for Toxic Substances and Disease Registry

residences. Areas with a higher percentage of the population living in overcrowded conditions will face higher risk for spread of infection.

Group Quarters: Group quarters are places where people live or stay in a group living arrangement. It covers a **wide array of facilities** including nursing homes, group homes, hospices, military barracks, and correctional facilities. Group quarters provide many opportunities for contagion, particularly where residents are sharing the rooms. Areas with a higher percentage of the population living in group quarters will face higher risk for spread of infection.

Multi-Unit Structures: Buildings which contain **more than one housing unit** increase the opportunity for contagion between residents. Apartment buildings where residents must routinely share the closed space of elevators are a prime example of this. Other structures, such as garden

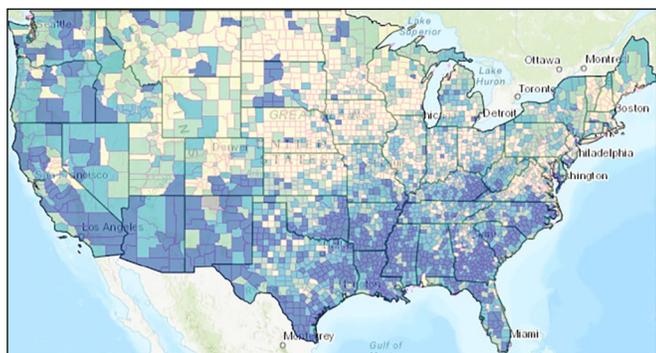
apartments, may not have the enclosed spaces of apartment buildings, but still will have higher levels of resident interaction than single family homes. Areas with a higher percentage of the population living in multi-unit structures will face higher risk for spread of infection.

Using the SVI to identify populations with high risk of infection

Early data on COVID-19 is bringing attention to the [deep health inequities in the country](#). The Household Composition/Disability theme, Minority Status/Language theme, and the Socioeconomic Status themes all contain variables which can highlight where larger concentrations of these higher-risk populations are residing. The overall theme scores can be used as a good proxy for these risks, but examination of individual variables can provide greater insight. These variables can indicate where testing resources and mitigation efforts might need to be deployed.

Population Aged 65 and Older: [Older populations](#) have shown the greatest COVID-19 mortality rates. Some of this stems from the higher rates of co-morbidities and other chronic health issues in this subpopulation. Areas with a higher percentage an older resident will face higher risk for infection and death.

NOSORH Data Tool



Population Older than 5 with a Disability:

Populations with [one or more disabilities](#) have underlying health conditions which could rapidly be compromised by a COVID-19 infection. Areas with a higher percentage people with disabilities will face higher risk for infection and death.

Minority Population: Minority populations have shown [higher rates of infection and death](#). There are multiple theories about why this is happening, including thoughts that minority populations have higher percentages of individuals who are [essential workers](#) — unable to work from home during the pandemic. Essential workers are more likely to have public exposure to infection. Areas with a higher percentage of minorities will face higher risk for infection and death.

Poverty Population: Individuals living in poverty are [more likely to be essential workers](#). They are less likely to be able to work from home and will be more likely to have public exposure to infection. Areas with a higher percentage of individuals in poverty will face higher risk for infection and death.

Conclusion

The CDC's Social Vulnerability Index provides an existing framework to target limited resources to areas of highest need during the COVID-19 pandemic. The [NOSORH COVID-19 Data Tool](#) allows users to visualize the SVI, and many other layers, to monitor rural communities in their state. An overview of the NOSORH COVID-19 Data Tool, including instructions for use, can be found on the [NOSORH website](#).

Reference Links

More information on the SVI can be found at: <https://svi.cdc.gov/>

The NOSORH COVID-19 Data Tool can be found at: <https://arcg.is/1Pmqfj>