About the Measure	
Domain:	Social Determinants of Health
Measure:	Social Vulnerability
Definition:	Social vulnerability is the degree to which a community exhibits certain social conditions, including high poverty, low percentage of vehicle access, or crowded households, that may affect that community's ability to prevent human suffering and financial loss in the event of disaster. These factors describe a community's social vulnerability.
Purpose:	Identifying vulnerable populations can help public health officials and local planners better prepare communities to respond to emergency events such as severe weather, floods, disease outbreaks, or chemical exposure.
Essential PhenX Measures:	None
Related PhenX Measures:	Neighborhood Concentrated Disadvantage Racial/Ethnic Segregation Social Networks Psychological Resilience
Measure Release Date:	

About the Protocol	
Protocol Release Date:	
PhenX Protocol Name:	Social Vulnerability/Community Resilience
Keywords:	Centers for Disease Control and Prevention; CDC; Agency for Toxic Substances and Disease Registry; ATSDR; Geospatial Research, Analysis, and Services Program; GRASP; Social Determinants of Health; Social Vulnerability Index; SVI
Protocol Name from Source:	Social Vulnerability Index (SVI)
Description:	The Social Vulnerability Index (SVI) provides specific socially and spatially relevant information to help public health officials and local planners better prepare communities to respond to emergency events such as severe weather, floods, disease outbreaks, or chemical exposure. The SVI provides specific socially and spatially relevant information to help public

	health officials and local planners better prepare for, respond to, recover from, and mitigate natural and human-made emergency events such as severe weather, floods, disease outbreaks, or chemical spills. The SVI can be used to • allocate emergency preparedness funding by community need; • estimate the amount and type of needed supplies like food, water, medicine, and bedding; • decide how many emergency personnel are required to assist people; • identify areas in need of emergency shelters; • create a plan to evacuate people, accounting for those who have special needs, such as those without vehicles, the elderly, or people who do not understand English well; and • identify communities that will need continued support to recover after an emergency or natural disaster. In addition, applications of the SVI increasingly link vulnerability to health behaviors and outcomes such as physical activity, physical fitness, and teenage pregnancy (e.g., An & Xiang, 2015; Gay, Robb, Benson, & White, 2016; Yee, Cunningham, & Ickovics, 2019). The SVI measures the relative vulnerability of the population in each U.S. census tract. Results can be aggregated to and assessed at the county and state levels as well. The SVI evaluates census tracts on 15 social factors, including unemployment, minority status, and disability, and groups them into four related themes: socioeconomic, household composition and disability, minority status and language, and housing and transportation. Each tract receives a ranking for each census variable, for each of four themes, and an overall ranking. In a second approach, each tract having a variable at the 90th percentile (or higher) is flagged; the flags are then summed to produce counts for each theme and overall.
Specific Instructions:	The Social Vulnerability Index (SVI) can be related to other ecological variables measured at the tract, county, or state level. It can also be included in multilevel analyses of tract, county, or state effects on individual behaviors or outcomes assuming that tract, county, and/or state identifiers are available. An ecological approach is provided by Gay, Robb, Benson, and White (2016). A multilevel approach is provided by An and Xiang (2015).
Protocol:	The relative vulnerability of the population in each U.S. Census tract can be determined using the Social Vulnerability Index. The SVI ranks the tracts on 15 social factors, including unemployment, minority status, and disability, and groups them into four related themes: socioeconomic, household composition and disability, minority status and language, and housing and transportation. Each tract receives a ranking for each Census variable and for each of four themes, and also an overall ranking. Ranking Census tracts within each state and the District of Columbia are ranked to enable mapping and analysis of relative vulnerability in individual states. Tracts for the entire United States are also ranked against one another, for mapping and analysis of relative vulnerability in multiple states, or across the U.S. as a whole. Tract rankings are based on percentiles. Percentile ranking values range from 0 to 1, with higher values indicating greater vulnerability. For each tract, we generated its percentile rank among all tracts for 1) the fifteen individual variables, 2) the four themes, and 3) its overall position.

	Flags The data can also be analyzed using flags as an alternative approach to rankings. Tracts in the top 10%, i.e., at the 90th percentile of values, are given a value of 1 to indicate high vulnerability. Tracts below the 90th percentile are given a value of 0. For a theme, the flag value is the number of flags for variables comprising the theme. The overall flag value for each tract is the number of all variable flags. To access the SVI data, visit https://svi.cdc.gov/data-and-tools-download.html and select "Data" for download type in the Data section of the form. SVI data from 2000, 2010, 2014, and 2016 are available for download in shapefile or .csv format. The accompanying documentation should also be downloaded with the data. This can be done by selecting "Documentation" for download type in the Data section of the form. The documentation contains further details on the data, including variable definitions.
Selection Rationale:	The Social Vulnerability Index (SVI) is a publicly available composite measure that relies heavily on census and American Community Survey (ACS) data. Additionally, it provides census tract–level information, accounts for housing and transportation factors, and is based on percentile rankings that can be aggregated.
Source:	Centers for Disease Control and Prevention (CDC). (2016, May 19). *Social Vulnerability Index (SVI)*. Retrieved from https://svi.cdc.gov/data-and-tools-download.html
Availability:	Publicly available
Life Stage:	Infant, Toddler, Child, Adolescent, Adult, Senior, Pregnancy
Language:	English
Participant:	Not applicable; derived from publicly available secondary data
Personnel and Training Required:	Knowledge of U.S. census and American Community Survey (ACS) data products and websites, such as American FactFinder, or commercial geospatial data products, such as those provided by vendors such as GeoLytics (http://www.geolytics.com). The extracted data need to be manipulated, and the Social Vulnerability Index (SVI) needs to be calculated.
Equipment Needs:	Access to a desktop or laptop computer with Internet access to download raw data from the U.S. Census Bureau's American FactFinder website (http://factfinder.census.gov). Statistical packages (e.g., SPSS, SAS) for data manipulation.
General References:	Agency for Toxic Substances and Disease Registry. (2018, September). *CDC's Social Vulnerability Index* (fact sheet). Retrieved from https://svi.cdc.gov/factsheet.html An, R., & Xiang, X. (2015). Social vulnerability and leisure-time physical inactivity among US adults. *American Journal of Health Behavior, 39*(6), 751–760. Flanagan, B. E., Gregory, E. W., Hallisey, E. J., Heitgerd, J. L., & Lewis, B. (2011). A Social Vulnerability Index for disaster management. *Journal of Homeland Security and*

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Mode of Administration:	Secondary data analysis
Derived Variables:	None
Requirements:	<table><tr><th>Requirements Category</th><th>Required (Yes/No):</th></tr><tr><td>Major equipment</td><td>No</td></tr><tr><td>Specialized training</td><td>No</td></tr><tr><td>Specialized requirements for biospecimen collection</td><td>No</td></tr><tr><td>Average time of greater than 15 minutes in an unaffected individual</td><td>No</td></tr></table>
Annotations for Specific Conditions:	No annotations at this time
Process and Review:	Not applicable