# COMMUNITY RESILIENCE ESTIMATES

**Quick Guide**

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Small Area Estimates Program

Social, Economic, and Housing Statistics Division

U.S. Census Bureau, Department of Commerce

# Contents

## OVERVIEW

Community resilience is the capacity of individuals and households within a community to absorb, endure, and recover from the impacts of a disaster. The Community Resilience Estimates (CRE) are experimental estimates produced using information on individuals and households from the 2018 American Community Survey (ACS), the Census Bureau's Population Estimates Program (PEP), as well as publicly available health condition rates from the National Health Interview Survey (NHIS).

The experimental CRE, in their current form, are specific to the current COVID-19 pandemic. Local planners, policy makers, public health officials, and community stakeholders can use the estimates as one tool to help assess the potential resiliency of communities and plan mitigation strategies. Although the CRE in their current form are specific to the current pandemic, the small area modeling techniques used to develop it are flexible and can easily be modified for a broad range of natural disasters (hurricanes, tornadoes, floods, etc.).

### Data

The ACS is a nationally representative survey with data on the characteristics of the U.S. population. The sample is selected from all counties and county-equivalents and has a sample size of about 3.5 million housing units each year.

Publicly available data from the 2018 NHIS are also incorporated. The NHIS is the principal source of information on the health of the non-institutionalized population of the U.S. The NHIS is a cross-sectional household interview survey with about 35,000 households containing about 87,500 persons.

Finally, we also use auxiliary data from the PEP, the Census Bureau Program that produces and publishes estimates of the population living at a given time within a geographic entity in the U.S. and Puerto Rico. We use population data from the PEP by tract, age group, race and ethnicity, and sex.

### Risk Factors

Resilience to a disaster is partly determined by the vulnerabilities within a community. In order to measure these vulnerabilities, and construct the community resilience estimates, we designed an individual risk index. The risk index is a weighted aggregate of the risk factors. The risk factors are binary components that add up to 11 possible risks in the risk index.

The specific ACS-defined measures we use are as follows:

<u>ACS-defined Risk Factors (RF) for Households (HH) and Individuals (I)</u>

- RF 1: Income-to-Poverty Ratio (IPR) < 130 percent (HH).
- RF 2: Single or zero caregiver household - only one or no individuals living in the household who are 18-64 (HH).
- RF 3: Crowding defined as either
    - Unit-level crowding defined as > 0.75 persons per room (HH) or

    - Household resides within a high-density tract defined as 75% of the population living in blocks with greater than 4,000 people per square mile
- RF 4: Communication barrier defined as either
    - Linguistically isolated (HH) or
    - No one in the household over the age of 16 with a high school diploma (HH)
- RF 5: No employed persons (HH)
- RF 6: Disability posing constraint to significant life activity
    - Persons who report having any one of the six disability types (I): hearing difficulty, vision difficulty, cognitive difficulty, ambulatory difficulty, self-care difficulty, and independent living difficulty.
- RF 7: No health insurance coverage (I)
- RF 8: Age >= 65 (I)

It is important to note that the ACS-defined risk factors three and four are not double flagged. For example, crowding is defined either at the housing unit level or the tract level. A person satisfying both crowding conditions is flagged once.

We also use several area-level NHIS-defined risk factors:

Health Condition RF

- RF 9: Serious heart condition (I)
- RF 10: Diabetes (I)
- RF 11: Emphysema or current asthma (I)

Publicly available NHIS data tables release information on the incidence rate of health conditions by age, sex, race and ethnicity, and region. The incidence rate from NHIS tables by health condition is used to randomly assign the risk factor (as a probability) to each individual in the ACS microdata. The incidence rate for the three health conditions is estimated for 120 possible combinations (3 age groups (less than 18, 18-64, and 65+) by 2 sex groups (male and female) by 5 race and ethnicity groups (Hispanic or Latino, NH White, NH Black, NH Asian, and NH Other) by 4 regions (West, Midwest, South, and Northeast)).

The result is an index that produces aggregate-level (tract, county, and state) small area estimates: the CRE. The CRE is the number of people facing a specific number of risks. In its current data file layout form, the estimates are categorized into three groups: zero risks, 1-2 risks, and three plus risks.