

CDC's Social Vulnerability Index (SVI)

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CSTE
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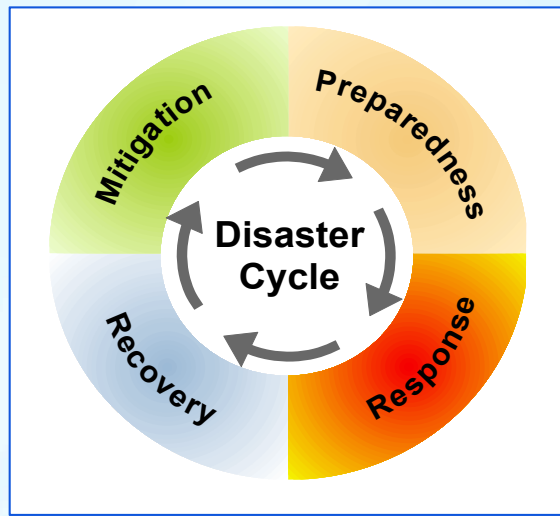
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Agency for Toxic Substances and Disease Registry
Division of Toxicology and Human Health Sciences



CDC's SVI Background & Rationale

- Social vulnerability refers to the demographic and socioeconomic factors that affect the resilience of communities in managing hazards.



- GRASP developed the SVI to help identify vulnerable populations before, during, and after hazardous events.

CDC's SVI Data & Methods

Overall Vulnerability

Socioeconomic Status

Below Poverty

Unemployed

Income

No High School Diploma

Household Composition & Disability

Aged 65 or Older

Aged 17 or Younger

Civilian with a Disability

Single-Parent Households

Minority Status & Language

Minority

Speak English "Less than Well"

Housing & Transportation

Multi-Unit Structures

Mobile Homes

Crowding

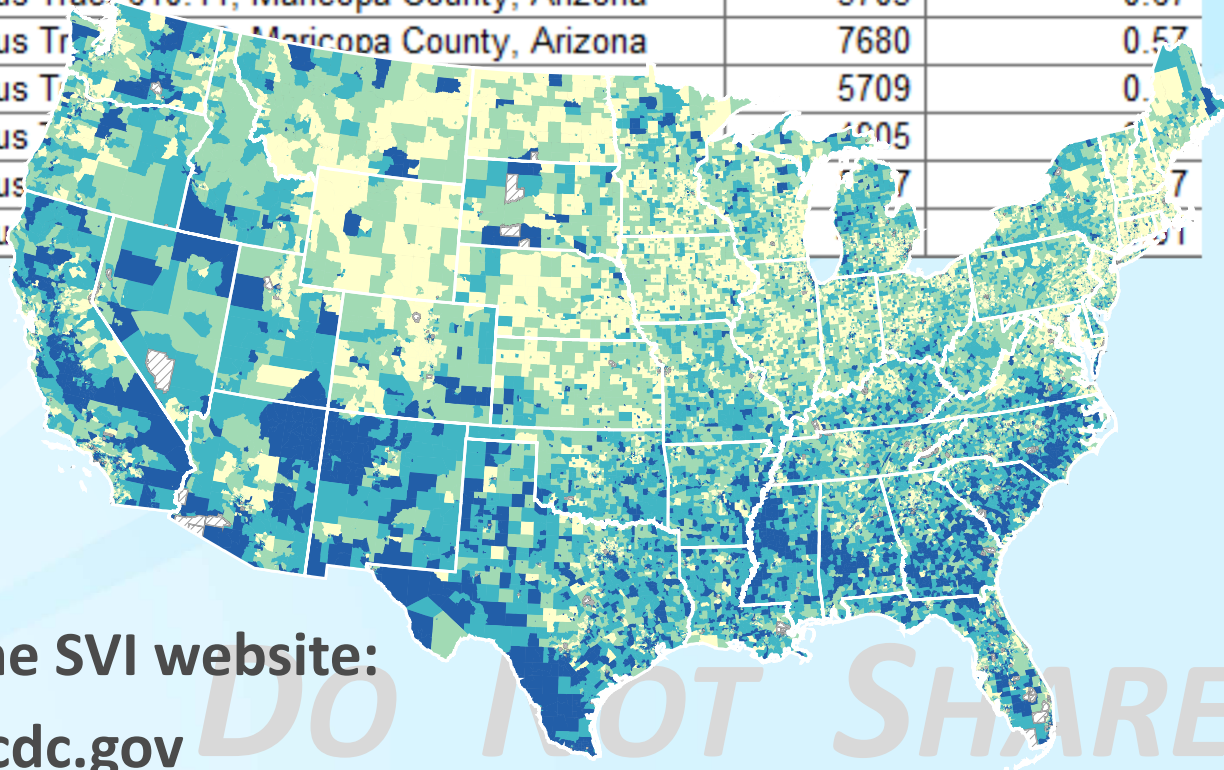
No Vehicle

Group Quarters

ARE

CDC's SVI Data & Methods

FIPS	LOCATION	TOTPOP	R_PL_THEMES
04013060904	Census Tract 609.04, Maricopa County, Arizona	3527	0.81
04013061009	Census Tract 610.09, Maricopa County, Arizona	8318	0.47
04013061010	Census Tract 610.10, Maricopa County, Arizona	4638	0.08
04013061011	Census Tract 610.11, Maricopa County, Arizona	5705	0.67
04013061012	Census Tract 610.12, Maricopa County, Arizona	7680	0.57
04013061013	Census Tract 610.13, Maricopa County, Arizona	5709	0.17
04013061014	Census Tract 610.14, Maricopa County, Arizona	4905	0.17
04013061015	Census Tract 610.15, Maricopa County, Arizona	5707	0.17
04013061016	Census Tract 610.16, Maricopa County, Arizona	5707	0.17



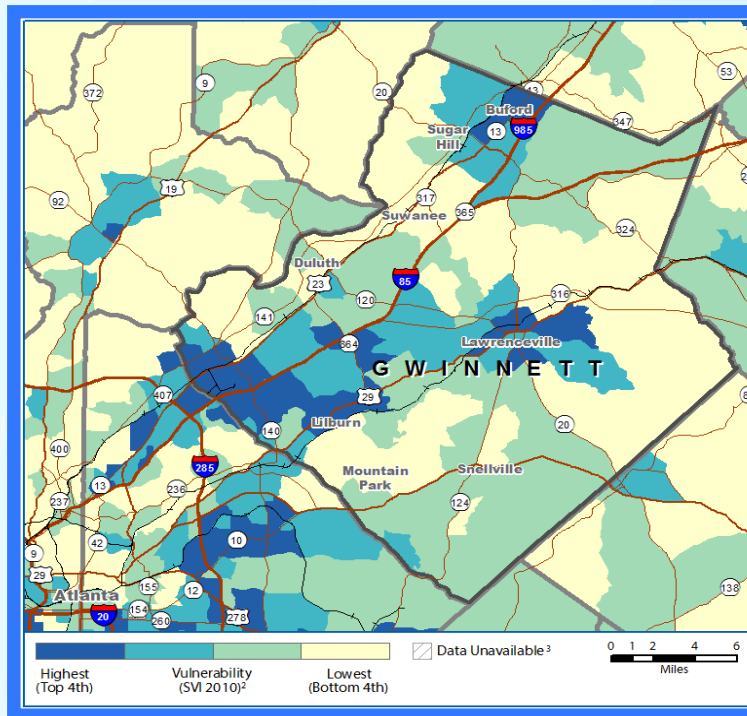
Download from the SVI website:

<http://svi.cdc.gov>

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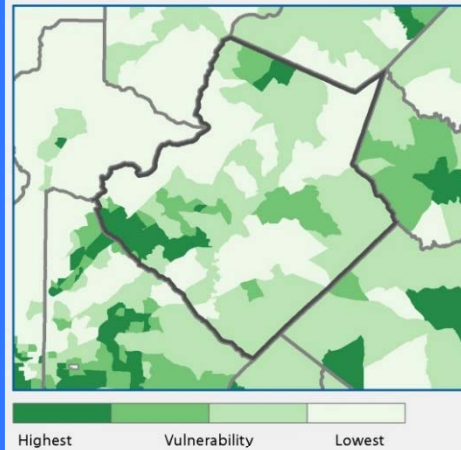
CDC's SVI Data & Methods

Overall Vulnerability

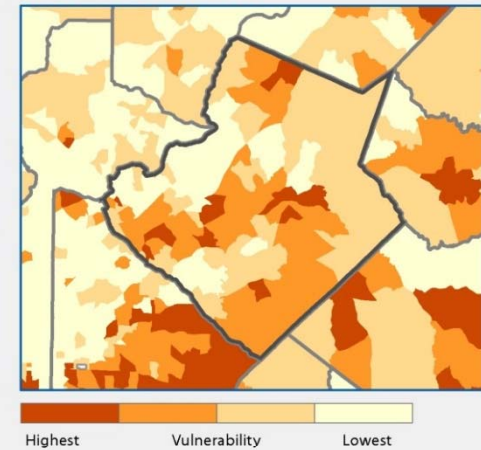


SVI Themes

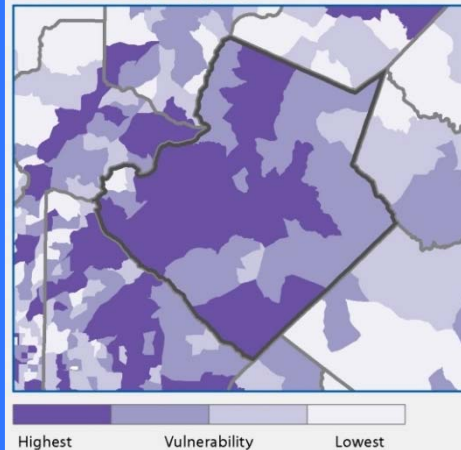
Socioeconomic Status



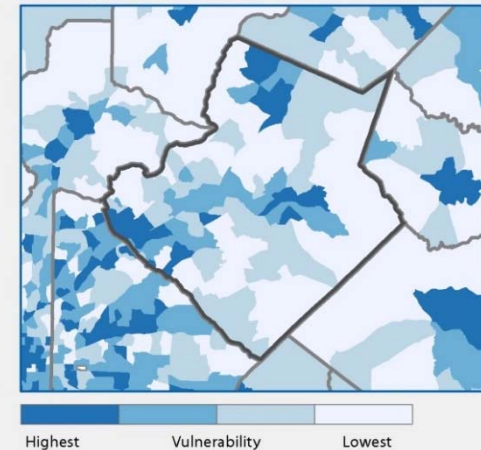
Household Composition



Race/Ethnicity/Language



Housing/Transportation



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What Can You Do with CDC's SVI Databases?

- **Map the data**
 - Identify areas with socially vulnerable populations
 - Target interventions
- **Facilitate decision-making**
 - Combine the SVI with other data resources (hazard, hospital or nursing home locations) and analyze data to prioritize funding and actions
 - Helpful in emergency preparedness, response, recovery, and mitigation

Planning for an Emergency: Strategies for Identifying and Engaging At-Risk Groups

A guidance document for Emergency Managers

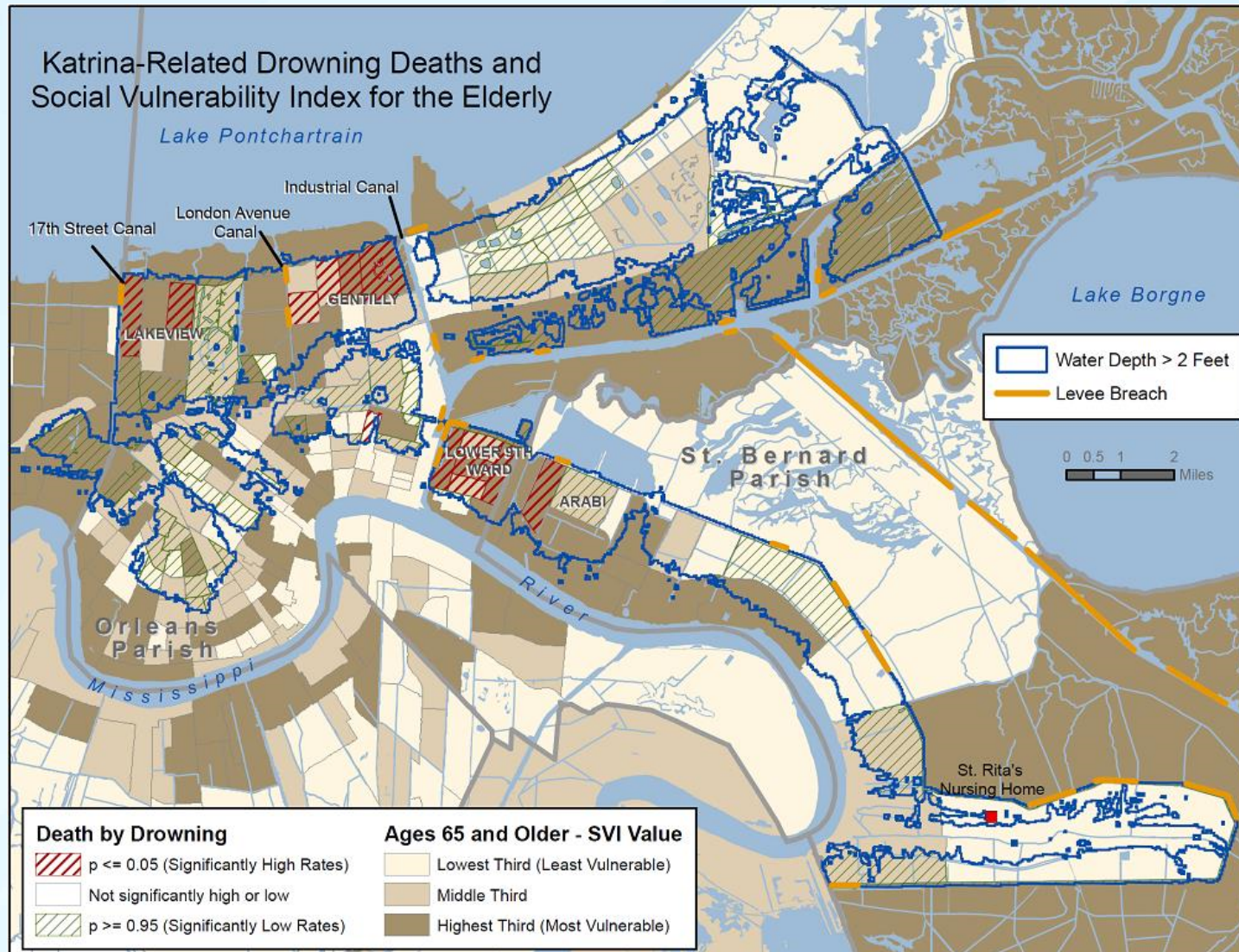


National Center for Environmental Health
Division of Environmental Hazards and Health Effects

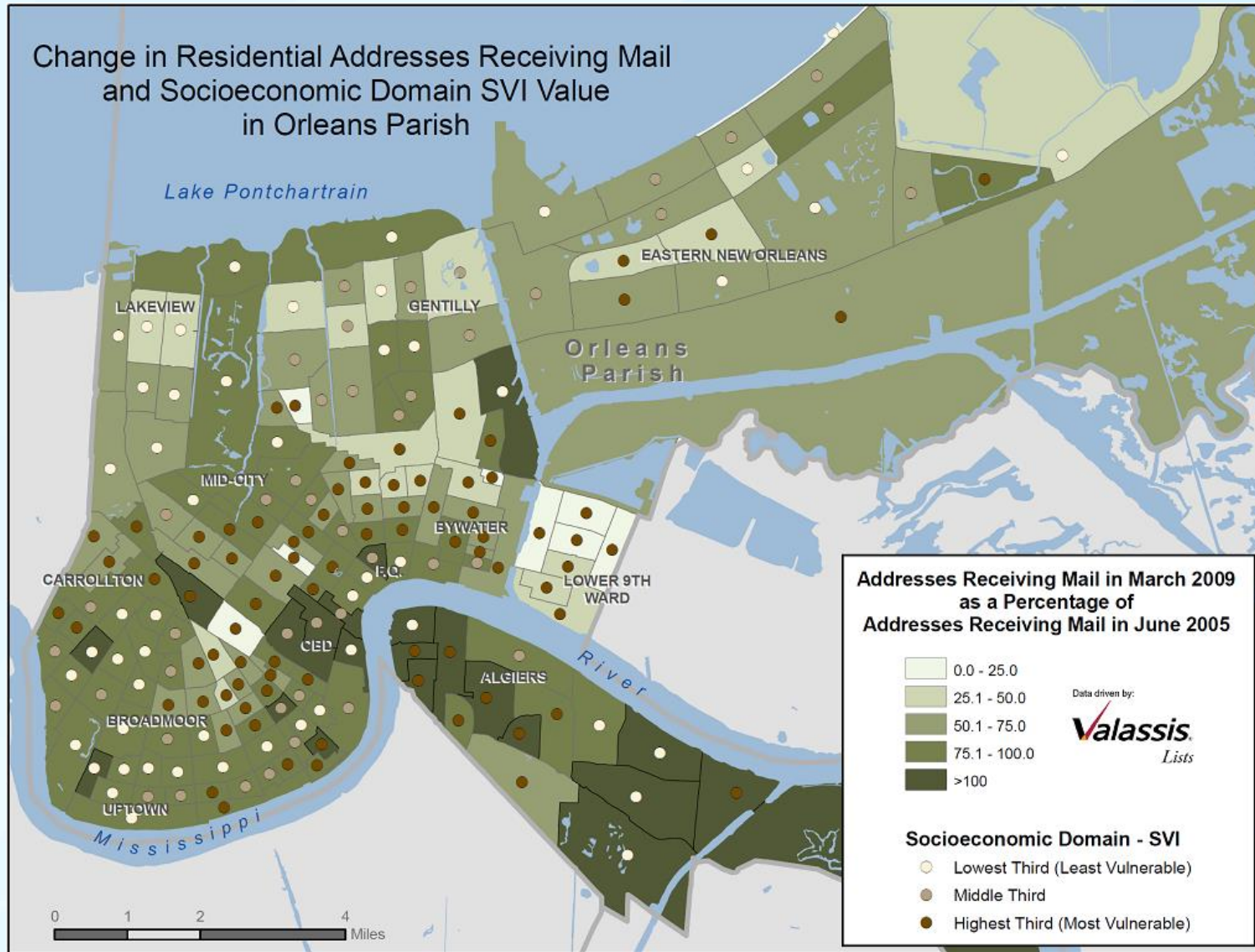


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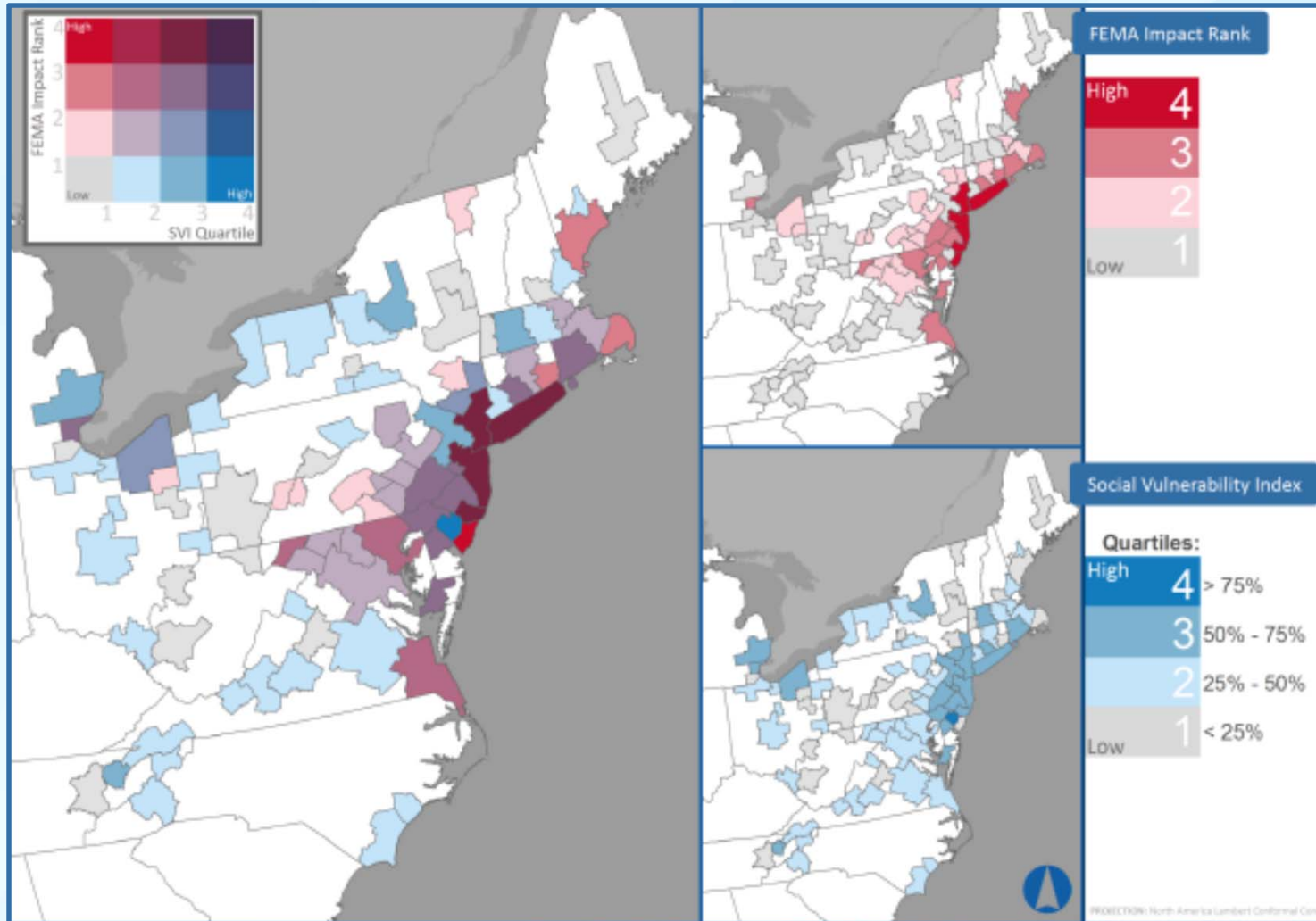
Hurricane Katrina Recovery and SVI



Hurricane Katrina Recovery and SVI



Hurricane Sandy Impact and SVI



Results of the bivariate Global Moran's I of SVI ranks with FEMA impact ranks revealed clustering of high social vulnerability in areas of high FEMA impact ranks (Moran's I = 0.199, p = 0.001)

Wilt, G.E.; Adams, E.E.; Thomas, E., Ekperi, L.; LeBlanc, T.T.; Dunn, I.; Molinari, N.; Carbone, E. (2018). A space time analysis evaluating the impact of hurricane sandy on HIV testing rates. *International Journal of Disaster Risk Reduction*, 28, 839 – 844.

SVI & GA heat-related Morbidity & Mortality

Data (county-level):

- Outcome 1: Heat-related Deaths
- Outcome 2: Heat-related Hospital Admissions
- Explanatory: Overall SVI

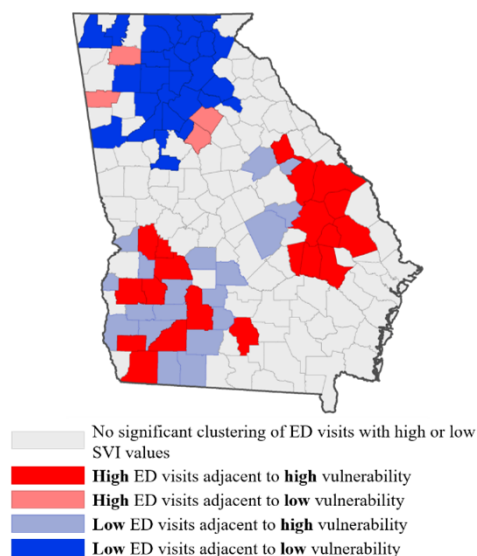
Analysis Techniques:

- Statistical: Logistic (admissions) & Poisson (deaths) regressions
- Spatial: Bivariate Moran's I

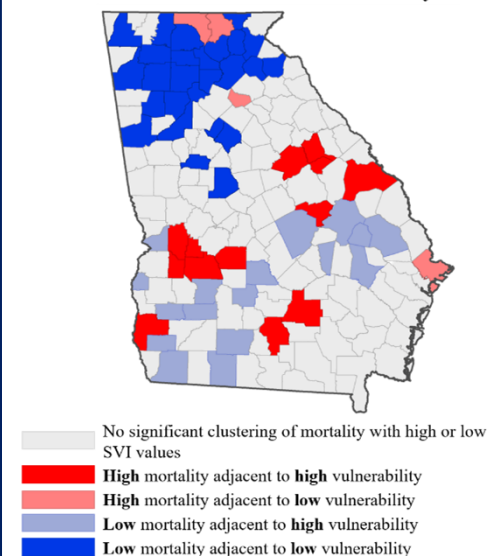
Results:

- High SVI is associated with high heat-related morbidity and mortality ($p < 0.01$).
- For every 10% increase in overall SVI ranking the odds of a heat-related ED visit increases by a factor of 1.18
- For each 10% increase in overall SVI the heat mortality rate increases by a factor of 1.31.
- Cluster analysis revealed that high death and high ED Visit rates were clustered around similar high SVI rankings.
 - Mortality: $I = 0.21$, $p < 0.001$
 - ED Visits: $I = 0.21$, $p < 0.001$

Bivariate Local Moran's I: ED Visits & SVI

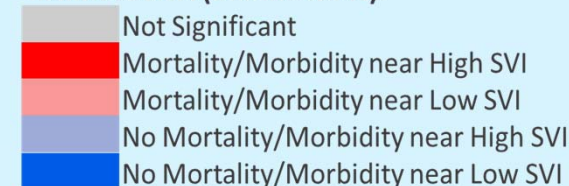


Bivariate Local Moran's I: EBS Mortality & SVI



Map: Clustering of Heat-related Morbidity and Mortality with SVI in GA

Bivariate LISA (Deaths & SVI):

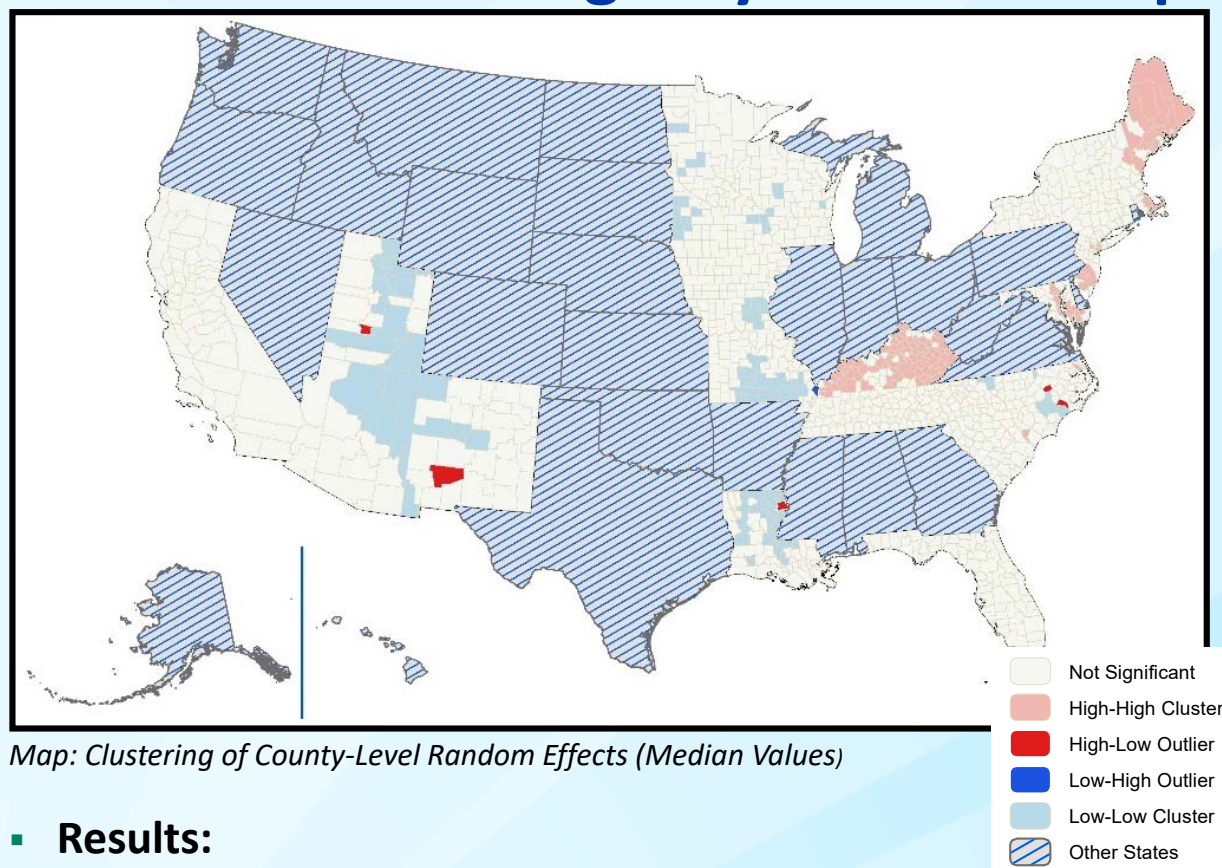


Paper under review with journal. Co-authors:

- Erica Adams – CDC/ATSDR (GRASP)
- Grete Wilt – CDC/ATSDR (GRASP)

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SVI & Emergency Asthma Hospitalizations



■ Data (county-level):

- Outcome: Asthma Emergency Department Visit Rates
- Explanatory: Overall SVI, PM2.5, Ozone, Temperature, Insurance

■ Analysis Techniques:

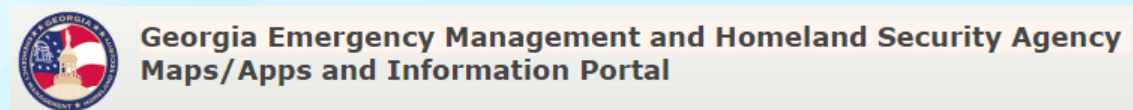
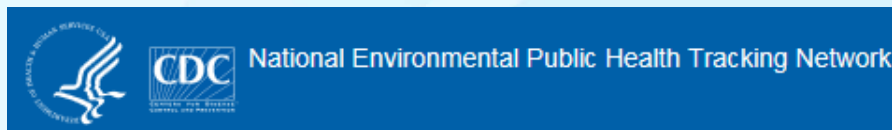
- Statistical: Bayesian hierarchical modeling
- Spatial: Moran's I

■ Results:

- Meaningful state and county-level variation in ED visits
- SVI values are statistically significantly associated with ED visits; **every one unit increase in Overall Social Vulnerability yields a 12-16% increase in Asthma ED Visit Risk** (consistent across states)
- Clustering of median random-effects suggest additional explanatory variables could improve performance of model

**Paper in-progress. Co-authors:
Jessica Kolling – CDC/ATSDR (GRASP)
Heather Strosnider – CDC/NCEH (Tracking)
Owen Devine – CDC/NCBDDD*

CDC's SVI Community & Projects



CATHOLIC CHARITIES USA DISASTER OPERATIONS MAP

Visit the SVI Website & Interactive Mapping Tool

ATSDR Agency for Toxic Substances & Disease Registry

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The Social Vulnerability Index (SVI)

What is the SVI?
Social vulnerability refers to the demographic and socioeconomic factors that affect the resilience of communities when confronted by external stresses on human health. Such stresses may come in the form of a natural or human-caused disaster, or as an outbreak of disease. Effectively addressing social vulnerability decreases both human suffering and economic loss. With this understanding, the Geospatial Research, Analysis, & Services Program (GRASP) developed a social vulnerability index, using U.S. census variables at the tract level, to help identify socially vulnerable communities. For information on the method used to construct the SVI, please see "[A Social Vulnerability Index for Disaster Management](#)" and "[SVI 2010 documentation](#)".

SVI Fact Sheet
View SVI Fact Sheet **GO** »

Data and Tools
Publications

SVI Mapping
Check the social vulnerability of your community
Zip code: *
Submit

News
Data for 2010 SVI now available!

SVI Community
Follow ATSDR on Twitter @
Contact the SVI Coordinator

SVI Topics

- Fact Sheet**
Learn about Social Vulnerability, the SVI, and its uses
- Interactive Map**
Zoom and pan, select a theme and layers (hospitals, etc.), click for tract info, export and print your customized map
- Data and Tools Download**
Download 2010 or 2000 SVI data and geospatial processing tools for Esri's ArcGIS
- Prepared County Maps**
View, save, and print SVI maps showing overall social vulnerability and the four themes at the census tract level for any county
- SVI Publications, Posters, Presentations, and other Materials**
Explore other SVI-related articles and materials produced by the CDC or our partners
- Other Social Vulnerability Resources**
Review websites, citations, and other resources of interest

ATSDR Agency for Toxic Substances & Disease Registry

Social Vulnerability Index (SVI) Mapping Dashboard

[About the Data](#) | [Help](#) | [SVI Home](#)

Customize your map Now Showing: **Socioeconomic Domain** | All States
[Data Classified by All US Census Tracts]

SVI 2000

Layer List | Export | SVI Resources | Zoom to ZIP code | Clear ZIP code

Layers

Infrastructure layers

- ☐ Hospitals
- ☐ Nursing Homes
- ☐ Day Care Centers
- ☐ Public Schools

FEMA/HHS Regions

- ☐ Region 1 ☐ Region 6
- ☐ Region 2 ☐ Region 7
- ☐ Region 3 ☐ Region 8
- ☐ Region 4 ☐ Region 9
- ☐ Region 5 ☐ Region 10

Base Map

- ☐ Street Map

Legend

- Highest (Top 4th)
- Vulnerability (SVI 2000)
- Lowest (Bottom 4th)
- Zero population census tracts

Scale: 1000 km, 500 mi

Website: <http://svi.cdc.gov>

Contact the SVI Coordinator:
svi_coordinator@cdc.gov

Thank you!

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Telephone: 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348

Visit: www.atsdr.cdc.gov | Contact CDC at: 1-800-CDC-INFO or www.cdc.gov/info

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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