Social Vulnerability and COVID-19 Incidence and Death in Michigan

During the early months of the COVID-19 pandemic, racial/ethnic minority communities experienced the disproportionate burden of disease in Michigan and other states. The State of Michigan became a national leader in reporting COVID-19 race data and working to mitigate disparities.

Understanding which counties have social and demographic factors that make them more vulnerable to negative outcomes from the pandemic can help inform interventions and resource allocation. These upstream social factors may drive racial inequities in the burden of the disease.

A University of Michigan research team examined the association between county-level social vulnerability characteristics and weekly cumulative COVID-19 incidence and mortality in Michigan from March 25 to July 29, 2020.

> **Social vulnerability** refers to the resilience of communities when confronted by external stresses on human health, stresses such as natural or human-caused disasters, or disease outbreaks.[1]

Key takeaways

1 Every broad domain of social vulnerability was associated with COVID-19 incidence and mortality in Michigan, including:

household composition
(age, disability, single-parent)

socioeconomic status
(income, employment, education)

housing & transportation
(housing type, crowding, vehicle)

minority status
(racial minority, limited English)

2 Within these broad categories, specific social factors most strongly associated with COVID-19 incidence and mortality were:

limited English proficiency

crowded housing

single parent households

3 In Michigan, a 0.1 increase in SVI (for example, the approximate difference in SVI between Ingham County at 0.57 and Genesee County at 0.69) was associated with approximately **13.3 excess COVID-19 cases and 0.5 excess deaths per 100,000 population**.

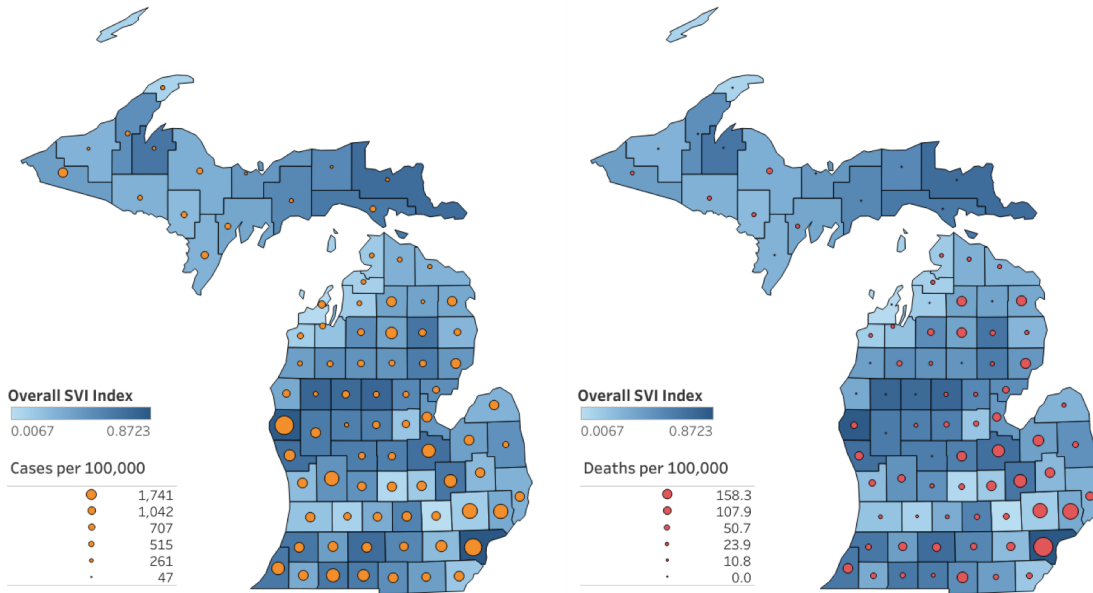## Implications for policy and practice

Longstanding social inequities, and the living and working conditions they generate, clearly drive the pandemic and its severity in Michigan. To address COVID-19 inequities, public health leaders should continue to target counties/localities with high SVI for:

- Expansion of testing sites: Because limited English proficiency was the factor most strongly associated with COVID-19 incidence and death, expanding testing for uninsured and immigrant populations will be critical
- Public service announcements: Target in areas with high SVI and include in other languages for populations with limited English proficiency
- Coordination with the housing authority and social service organizations to discuss, assess, and address certain social needs that might contribute to COVID-19 transmission

Counties in the state with greater social vulnerability (e.g., Detroit and Grand Rapids areas) had higher COVID-19 incidence and mortality.

The top 3 counties with the highest COVID-19 incidence rates and the top 3 with the highest mortality rates had **higher levels of SVI**.
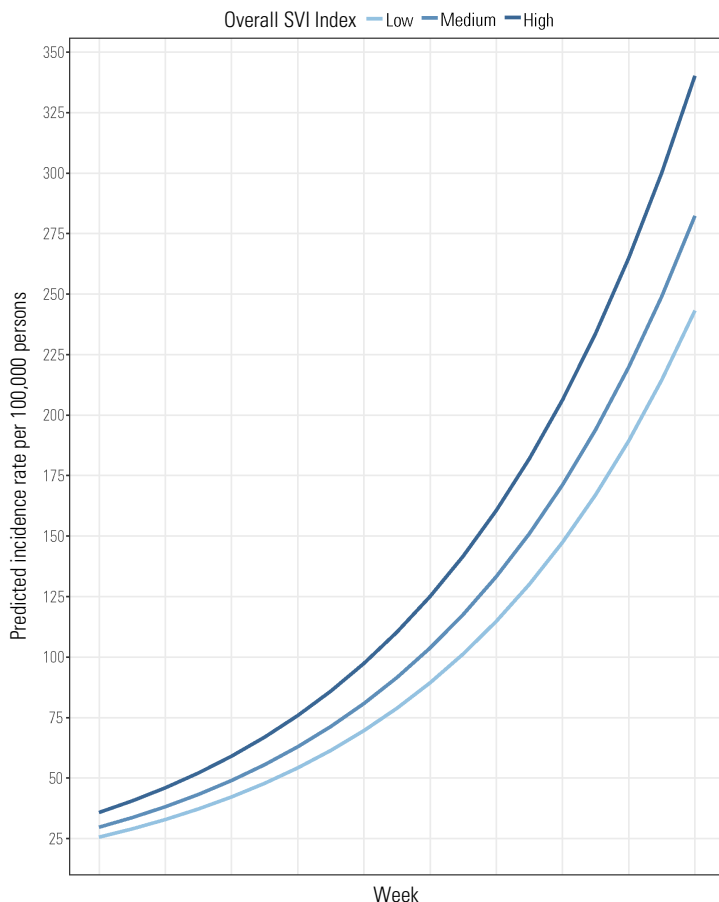
Counties with the highest incidence rates:
1. Oceana
2. Wayne
3. Oakland

Counties with the highest mortality rates:
1. Wayne
2. Macomb
3. Oakland

Overall SVI Index

0.0067   0.8723

Cases per 100,000

	1,741
	1,042
	707
	515
	261
	47

Overall SVI Index

0.0067   0.8723

Deaths per 100,000

	158.3
	107.9
	50.7
	23.9
	10.8
	0.0

Note: Data are as of July 29, 2020

Counties with higher SVI had higher COVID-19 incidence than counties with lower SVI.

Overall SVI Index — Low — Medium — High

Note: Data are as of July 29, 2020

Data Sources

Data were drawn from the CDC Social Vulnerability Index (SVI) — a composite measure of susceptibility to health shocks, including disease outbreaks — and the Johns Hopkins University Center for Systems Science and Engineering data repository. Mixed effects regression was used to estimate the effect of county-level SVI on COVID-19 incidence and mortality.

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