



Background

- Sickle cell disease (SCD) is a genetic disorder that primarily impacts underrepresented racial and ethnic groups in the United States.
- SCD is associated with high rates of acute healthcare utilization, specifically emergency department (ED) visits.
- Populations impacted by SCD are often subjected to structural racism and discrimination in the form of inequitable social circumstances, residential segregation, and health care access.

Objective

- To examine associations between ED visits and community-level social vulnerability among individuals with SCD in Michigan.

Methods

- The Michigan Sickle Cell Data Collection (MiSCDC) program uses multiple clinical and state-maintained databases to collect population-level data on people with SCD in Michigan.
- MiSCDC was used to identify individuals with SCD living in Michigan in 2018 using validated case definitions.
- Residential census tract at time of last healthcare encounter in 2018 and number of ED encounters in 2018 was obtained from MiSCDC.
- The Centers for Disease Control and Prevention (CDC) Social Vulnerability Index (SVI) Score was used to measure community vulnerability at the census tract level. Scores ranged from low vulnerability=0 to high vulnerability=1.
- MiSCDC study population and SVI scores were linked using census tract Federal Information Processing System (FIPS) codes.
- Independent samples t-test examined associations between SVI scores for Michigan census tracts with and without known SCD residents based on persons identified through MiSCDC.
- Associations between individual-level SVI scores and ED utilization were analyzed using zero-inflated negative binomial models with clustered standard errors at the census tract level, adjusted for age and sex. Analyses were stratified by two age groups: pediatric (under 19 years) and adult (19 years and older).

Results

- Population characteristics: N=3,314, mean age was 28.7 (SD=18.3) years old, 58% were female, and 82% were Black.
 - Pediatric (<19 years): N=1,045 (31.5%)
 - Adult (≥19 years): N=2,269 (68.5%)
- 64% of Michigan individuals with SCD lived in tracts with overall SVI scores in the highest vulnerability quartile (*Figure 1*).

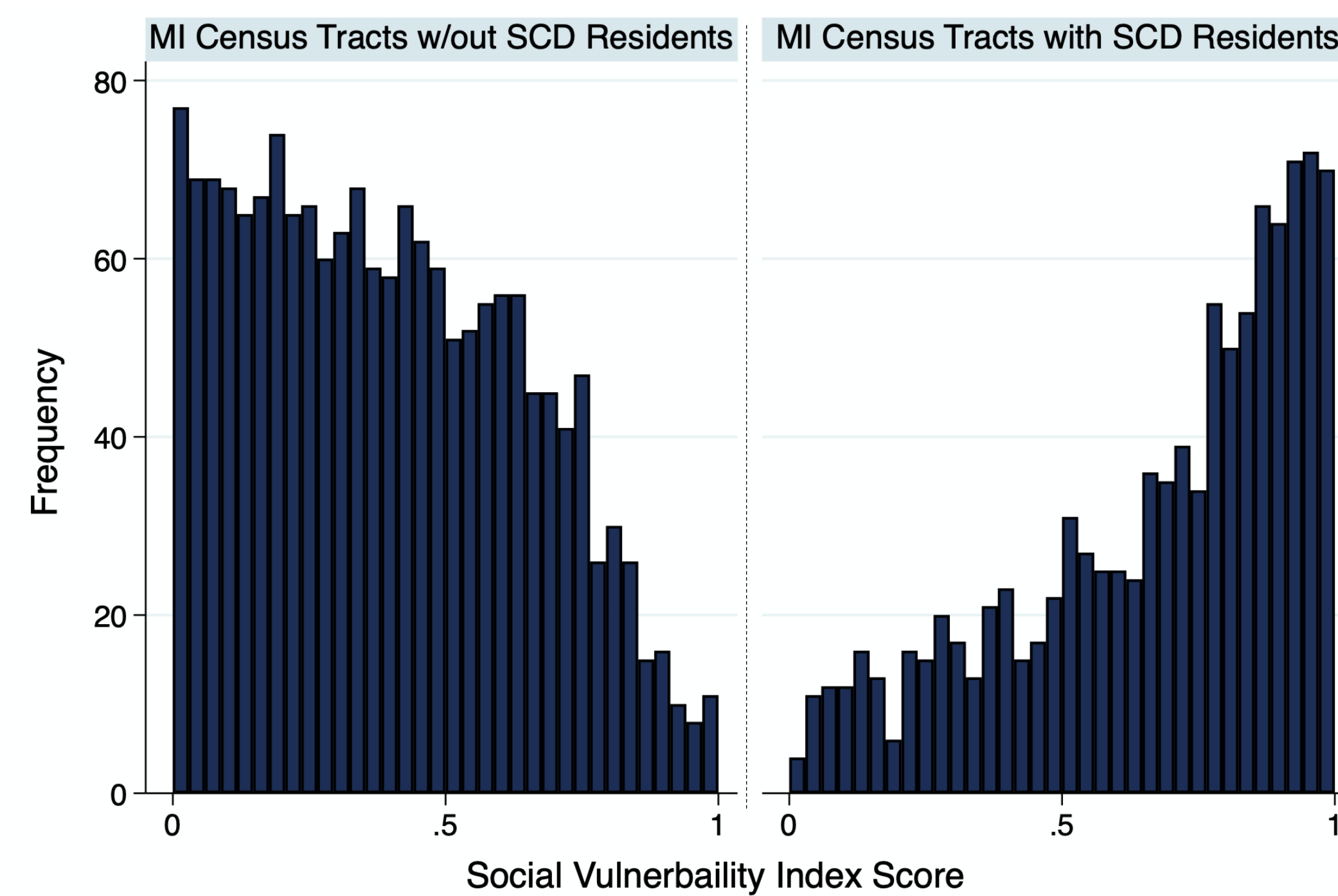


Figure 1. Michigan Census Tract SVI Score by SCD Status. Distribution of SVI score for Michigan Census Tracts. SVI scores were higher among census tracts where individuals with SCD resided (mean SVI=0.68; SD=0.26) compared to tracts without individuals with SCD (mean SVI=0.39; SD=0.25; $p<0.001$).

Conclusion

- Individuals with SCD in Michigan were more likely to live in census tracts with higher social vulnerability compared to people without SCD.
- Children with SCD living in communities with higher levels of social vulnerability had increased use of ED services.
- Future research should investigate the feasibility of community-level interventions to reduce ED utilization among populations impacted by SCD, including increased access to primary care and transportation assistance to clinic appointments and pharmacies.

- The average number of ED visits per person in 2018 was 3.2 (SD=10), and 39% of Michigan individuals with SCD had no ED visits in 2018.
- There was no association between SVI score and ED use in the adult population.
- Children under 19 living in higher vulnerability communities had greater use of ED compared to those living in communities with lower SVI scores (IRR=1.085 (SE=.033); $p=0.008$) (*Figure 2*).

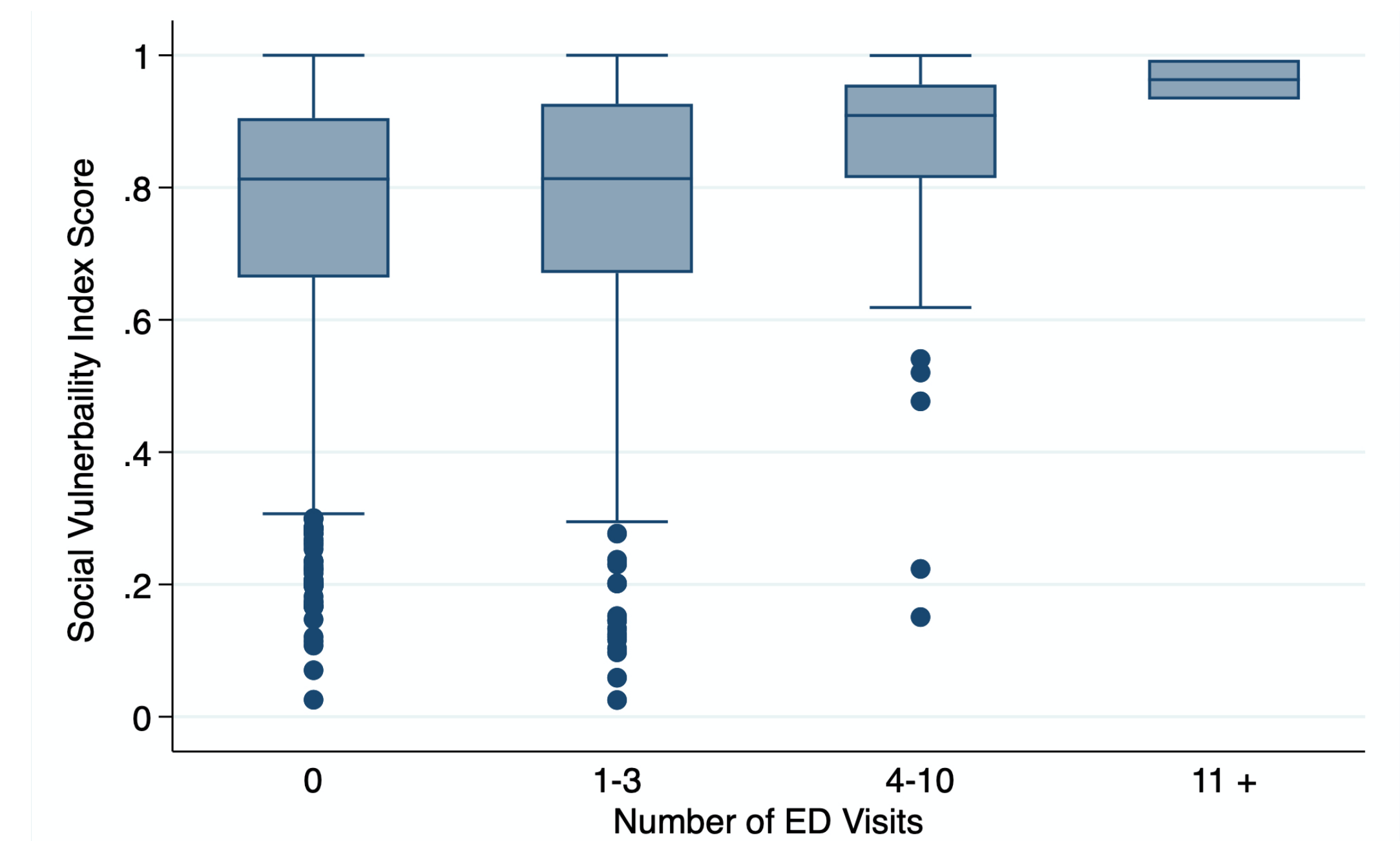


Figure 2. SVI and ED Use for Michigan Children with SCD. Children living in census tracts with higher SVI scores had higher ED use compared to those living in census tracts with lower SVI scores. For every 0.1 increase in SVI score, we found the number of ED visits increased by 8% (IRR=1.085 (SE=.033); $p=0.008$).

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