



Neighborhood Characteristics Associated with Firearm Injuries in Children and Adolescents Across the U.S.

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Introduction

- Firearms were identified as the leading cause of death for those aged 1 to 19 in 2020 by two sources.
- Addressing neighborhood-level factors may help prevent pediatric firearm-related injury.
- There is limited research on the role of community factors in explaining variations in pediatric firearm incidents.

Objective

This study aims to analyze neighborhood characteristics and their association with firearm injuries among children and adolescents.

Methodology

Study Design

- Ecological study.

Study Setting

- ZIP Code level analysis. 2018 to 2022.
- Analyzed data from 47 U.S. states.

Patient Population

- Children aged 0-17 years.
- Included fatal and non-fatal injuries.

Variables

- Examined 65 variables by ZIP Code from five data sources:
 - American Community Survey: Demographics & Socioeconomics.
 - Social Vulnerability Index (SVI): Community resilience.
 - Child Opportunity Index (COI): Access to resources.
 - Giffords Scorecard: Gun laws.
 - Structural Racism Index (SREI): Impact of racism.

Data Collection

- Data from five sources by ZIP Code.

Outcomes

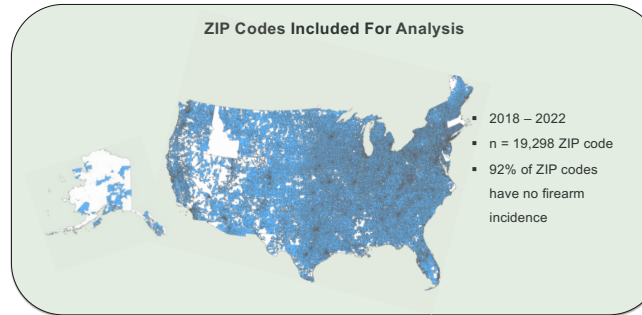
- Total firearm injuries and deaths per ZIP Code.
- Data from the National Emergency Medical Services Information System (NEMSIS, all 9-1-1 responses by EMS).
- Data from the Gun Violence Archive (GVA, all police and public reported firearm events).

Statistical Analysis

- Performed stepwise backward selection to identify the best subset of predictors from 65 variables.
- Conducted regression models with each subset by data source and domain.
- Compared models using adjusted R-square and AIC to evaluate fit.

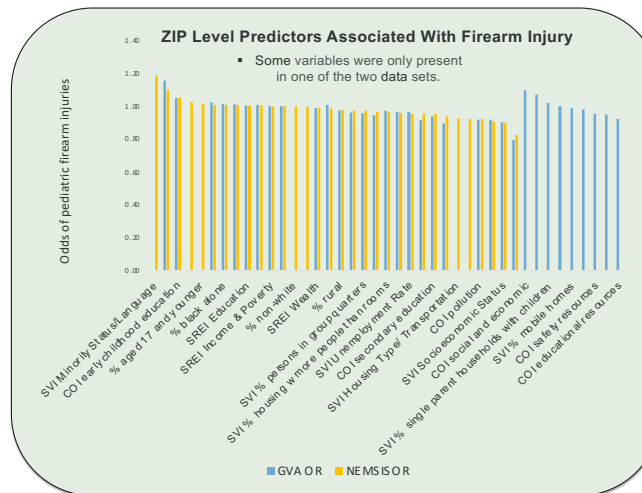
Results

ZIP Codes Included For Analysis

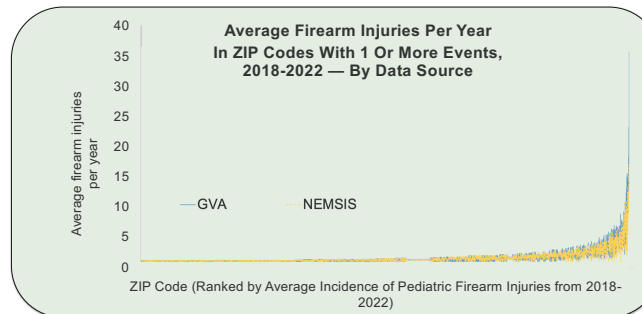


Results from the 8% of ZIP codes with Firearms injuries

ZIP Level Predictors Associated With Firearm Injury

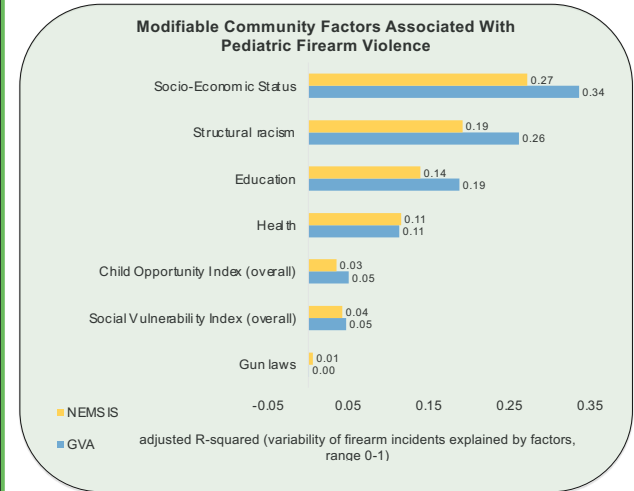


Average Firearm Injuries Per Year In ZIP Codes With 1 Or More Events, 2018-2022 — By Data Source



Results Continued

Modifiable Community Factors Associated With Pediatric Firearm Violence



Limitations

- The study's design identifies associations, not causation.
- Limited by ZIP code areas rather than geographic neighborhoods/communities.

Conclusion

- Best model explained variation using 35 variables across all domains and data sources.
- Community factors explained approximately 40% of the variability in pediatric firearm injuries across ZIP codes.
- Socio-Economic Status (SES) was the strongest predictor across domains.
- The rank-order list of modifiable community factors provides a roadmap for community interventions and resource allocation to reduce pediatric firearm injuries.

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- References
- CPR-EM Website
- LinkedIn

