Pediatric trauma mortality differs by neighborhood opportunity level

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Abstract

- Traumatic injury stands as a leading cause of mortality among children in the United States, with neighborhood conditions playing a significant role in a child's risk of injury.[1,2]
- Children in disadvantaged neighborhoods face higher all-cause and in-hospital mortality rates compared to their more advantaged peers, yet research on the link between neighborhood characteristics and trauma-related mortality is limited.[3,4]

Objective: This study aimed to characterize fatal pediatric traumatic injuries and their distribution across neighborhood opportunity levels, as measured by the Child Opportunity Index (COI).

Methods

- Multicenter, retrospective cross-sectional study was conducted across 15 trauma centers within Los Angeles (LA) County to evaluate trauma activation mortalities involving children (<18 years old) from 2010 to 2021.
- Clinical and demographic data from the county trauma registry were liked to COI via home zip code.
- Proportion of mortalities were compared to the proportion of children within each COI quintile and injury mechanism was evaluated across COI quintiles.
- Analysis was performed using Kruskal-Wallis and chi-square tests (α = 0.05).

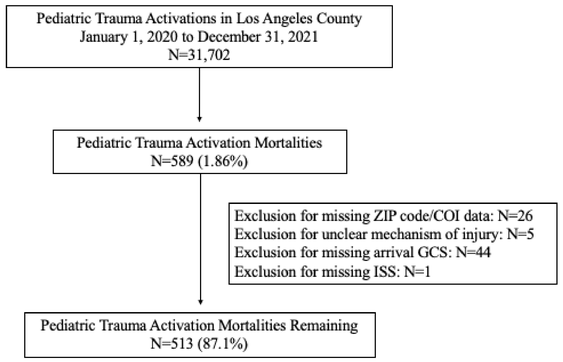

Fig. 1: Patient inclusion flow diagram for fatal pediatric trauma activations (<18 years old) in Los Angeles County.

Results

Cohort Characteristics

- Median age = 14 years old (IQR, 5-16), majority of patients were male (70%)
- Assault (37%) and pedestrian injuries (24.8%) were the most common mechanism of injury, followed by motor vehicle collisions (20.7%), falls (7%), self-inflicted (5.5%), and other (5.1%)
- 32.6% of all trauma mortalities were firearm related
- Emergency department disposition was death in half of encounters (50.3%)
- Median time from arrival to death = 1.2 hours (IQR, 0.2-24.1)

Child Opportunity Index

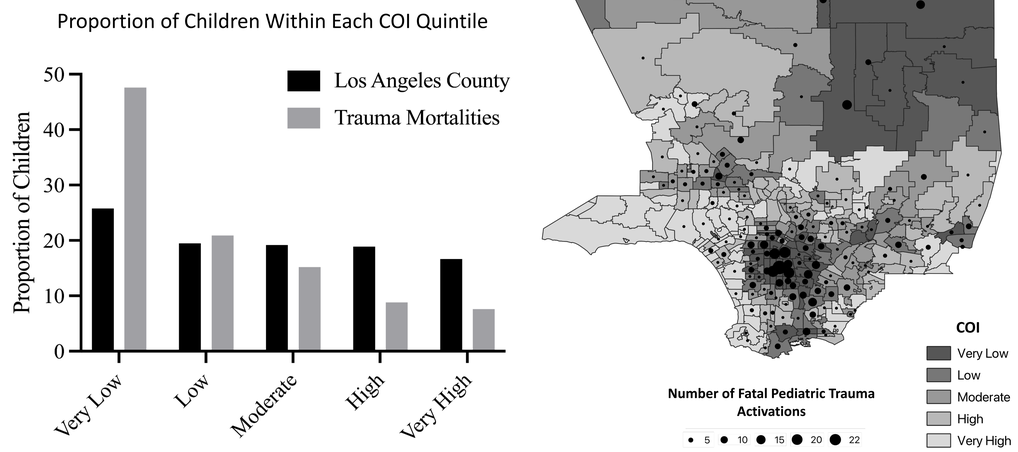

Fig. 2: A) Proportion of children within each Child Opportunity Index quintile for pediatric trauma activation mortalities and Los Angeles County. B) Distribution of Child Opportunity Index quintiles for Los Angeles County and number of fatal pediatric trauma activations.

- Children from very low COI neighborhoods accounted for 47.6% of trauma mortalities, despite making up only 25.8% of the child population in Los Angeles County (p<0.001)
- Children from high and very high COI neighborhoods represented a smaller proportion of trauma mortalities (8.8% and 7.6%) compared to their representation in LA County (18.9% and 16.6%; p<0.001 for both)

Mechanism of Injury

- Assaults accounted for a greater proportion of trauma mortalities for the very low and low COI (43.0% and 48.6%) compared to moderate (25.6%), high (20.0%), and very high (10.3%) COI
- For moderate, high, and very high COI, a greater proportion of mortalities were due to self-inflicted injuries (6.4%, 8.9%, and 17.9%) than in low and very low COI
- The proportion of mortalities that involved a firearm differed by COI level, with a greater proportion in very low (36.5%) and low COI neighborhoods (42.1%) (p=0.001)

Conclusions

- Traumatic mortalities occurred disproportionately in children from very low opportunity neighborhoods
- Assaults and pedestrian injuries were common injury mechanisms among pediatric mortalities
- Mortality mechanisms varied by neighborhood — assault was more common in lower opportunity neighborhoods, while self-inflicted injuries were more prevalent in higher opportunity neighborhoods

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