

DECREASED NEED FOR SURGICAL INTERVENTION AMONG CHILDREN FROM AREAS OF HIGHER NEIGHBORHOOD DISADVANTAGE FOLLOWING TRAUMATIC INJURY

JACLYN E OREHOVA, EMILY MYERS MD, KEREN EYAL MD, KACI PICKETT MS, JOSE DIAZ-MIRON MD, MARK MALHAM, BECKY HILL NP, MARINA REPPUCCI MD, KATHLEEN ADELGAIS MD, SHANNON N ACKER MD

Purpose of Study: Area deprivation index (ADI) is a validated composite measure of neighborhood level disadvantage. We previously examined the relationship between ADI and pediatric trauma mechanism, severity, and outcomes and found higher injury severity among patients from neighborhoods of greater deprivation. Despite lower injury severity, the frequency of surgical intervention was higher for children from neighborhoods with lower socioeconomic disadvantage. We hypothesized that there would be differences in both the frequency and type of operative procedures among ADI quintiles related to underlying factors of injury mechanism and injury severity.

Methods Used: A cross-sectional analysis of pediatric trauma patients aged 0-18 years presenting to our Level I Pediatric Trauma Center between January 1, 2016 and December 31, 2021 was performed. Clinical data were obtained from the Children's Hospital Colorado (CHCO) Trauma Registry and abstraction of the electronic health record. Patients were excluded if their home address was missing or incomplete. Patients were grouped into quintile using the 2020 version of ADI. Higher ADI quintile corresponded to greater neighborhood disadvantage. Operations were categorized into neurosurgical, orthopedic, general surgery, and other operations. Relationship between ADI quintile and volume and type of operative intervention, body region, and injury severity were evaluated. Descriptive statistics were summarized for continuous variables with medians and interquartile ranges, and for categorical variables with frequencies and proportions. Group differences are tested via t-test or Kruskal-Wallis test for continuous variables and Chi Squared test or Fisher's Exact tests for categorical variables.

Summary of Results: A total of 5,655 pediatric patients suffered traumatic injuries, 3378 (59.7%) of whom underwent an operation including 48 neurosurgery (1.4%), 2253 orthopedic (66.7%), 88 general surgery (2.6%), and 989 other operations (29.3%). The percentage of operations varied by ADI quintile ($p < 0.001$). Orthopedic procedures made up 70.2% of operations in the 1st quintile and 63.1% of operations in the 5th quintile, correlating with a higher rate of extremity injury in children from areas of lower deprivation (56.2% of 1 quintile vs 44.1% of 5 quintile, $p < 0.001$). Patients who underwent orthopedic operations had a significantly lower mean Injury Severity Score (mean = 6.2, SD = 4.7, $p < 0.001$) compared to neurosurgical operations (mean = 21.7, SD = 9.8, $p < 0.001$) and general surgery operations (mean = 16.0, SD = 15.0, $p < 0.001$).

Conclusions: Among children who suffered traumatic injury and required an operation, rate of operative intervention was higher among children with lower neighborhood level deprivation. Orthopedic procedures made up most operations for all quintiles, with rate of orthopedic procedures decreasing with increasing deprivation, like the variation in rate of extremity injury by ADI quintile.