



## Prehospital traumatic pain management varies by neighborhood based Social Deprivation Index

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**Background:** Prehospital pain is often undertreated with noted disparities in age and race. However, evaluations of EMS pain management based on detailed community characteristics that impact health outcomes have not been done. One scale, the social deprivation index (SDI), incorporates multiple community health outcome markers including poverty, education, household structure, overcrowding, employment, and age derived from neighborhood census tract data. Our objective was to evaluate for potential disparities in prehospital pain management (PPM) based on community level SDI.

**Methods:** This was a retrospective evaluation of 911 response with patient contact from January 2018 to June 2021 in the national ImageTrend Collaborate dataset. Traumatic incidents were defined using NEMSIS data element eInjury.01 terms: gun, firearm, sharp, fall, push, jump, motor, traffic, blunt. These were stratified into severe trauma with either an initial/final acuity of critical or any systolic blood pressure (SBP) < 90 mmHg. Prehospital pharmacologic treatment with fentanyl, morphine, nitrous oxide, hydromorphone, tramadol, ibuprofen, acetaminophen, ketamine, and ketorolac defined pain management. Census based SDI scores were matched with the geospatial locations of patient care events in the prehospital data set. SDI scores census tracts from least disadvantaged to most disadvantaged (1 -100) and were categorized by quartiles. Descriptive statistics and univariate logistic regression (odds ratio, OR) were conducted.

**Results:** A total of 15% of incidents met inclusion criteria (2,160,348/14,649,090 records) and of these, 31% (n=677,393) were severe trauma. PPM was provided in 176,449 (8%) all trauma and 79,143 (12%) severe trauma incidents. There was a difference in PPM between the least disadvantaged (9%) to most disadvantaged quartile (6%) for SDI. There were lower odds of receiving pain management for all trauma incidents occurring in the most disadvantaged SDI quartile ( $\geq 76$ ) compared to the least disadvantaged ( $\leq 25$ ; OR 0.65, 95% CI: 0.64-0.66). This association was still apparent in patients with severe trauma (OR 0.91, 95% CI: 0.89-0.93).

**Conclusion:** Prehospital pain management varied based on SDI suggesting that community factors play a role in services provided. Recognizing the variability in community level care requires further evaluation. Future studies will evaluate the association of PPM with other prehospital and community level variables.

