Comparing Social Determinants of Health after Trauma in Rural and Urban Settings in Pennsylvania
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Background
- The impact of social determinants of health (SDOH) on outcomes is an important facet of healthcare.
- The effects of SDOH are understudied in traumatic injury.
- Prior work has focused on socioeconomic factors in urban violence settings.
- It is unclear how SDOH impact outcomes of injuries across urban and rural areas.

Hypothesis
We hypothesized that SDOH factors would be associated with differences in mortality between urban and rural communities and would improve mortality prediction at the patient level.

Results
- We included 266,580 urban, 27,234 suburban, and 14,761 rural patients.
- 89 SDOH variables demonstrated significant association with increased or decreased risk of mortality.
- There were 28 (31%) risk factors unique to urban settings, 7 (8%) risk factors unique to rural settings, and only 1 (1%) risk factor unique to suburban setting.
- Unique urban risk factors included poverty, income, and public assistance programs and insurance while unique rural risk factors included low education, crowded living conditions, and no health insurance.
- The sole unique suburban risk factor was proportion of population in mobile homes (aOR 1.01; 95%CI 1.01-1.02 per %, p=0.04) which also improved model fit (BIC 50167 vs 42418) and slightly improved discrimination (AUC 0.936 vs 937).

Methods
- Variables from the Agency for Healthcare Research and Quality’s Social Determinants of Health Dataset were merged at the zip code level to patient level data in the 2000-2017 Pennsylvania Trauma Outcomes Study (PTOS).
- Logistic regression was applied to determine if SDOH were significant risk or protective factors for mortality after injury.
- SDOH variables were then added to a PTOS base mortality model and compared using Bayesian information criterion (BIC; lower is better fit) and area under the curve (AUC; higher is better discrimination) to determine change in model fit and discrimination.

Conclusions
We identified differing SDOH that were associated with mortality after injury among rural, suburban, and urban patients. These are key novel findings, as future work to address SDOH among injured patients will need to take a tailored approach based on the geography the patient comes from.