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## Background

- Low socioeconomic status (SES) and minority patients are less likely to receive regional anesthesia for elective urologic surgery.
- Area based social determinant of health (SDOH) factors can be used to study disparities in health care delivery.
- Spatial data science can be used to actively identify and measure the impact of reductions in SDOH disparities after a quality improvement initiative.

## Objectives

- To determine if area based SDOH disparities and location-based risk factors were associated with the use of caudal nerve blocks in elective urologic surgery before and after a QI initiative designed to reduce disparities.

## Methods

- Single center retrospective study of 2,507 children <5 years old scheduled for elective urologic surgery from 2019-2022.
- Patient electronic health records were geocoded and spatial data linkage with the United States Census American Community Survey 2020 Data (5-Year).
- Analysis was conducted at the patient- and block-group level.
- HIPAA-compliant spatial analysis was conducted using Python and ESRI ArcGIS Pro.

## Discussion

- Patient and geographic SDOH risk factors can be used to study disparities in regional anesthesia.
- "Hot and Cold Spot" spatial analysis can identify and demonstrate reductions in SDOH and geographic disparities after a QI initiative.
- Health care systems need to re-imagine, innovate, and build the future of care delivery.



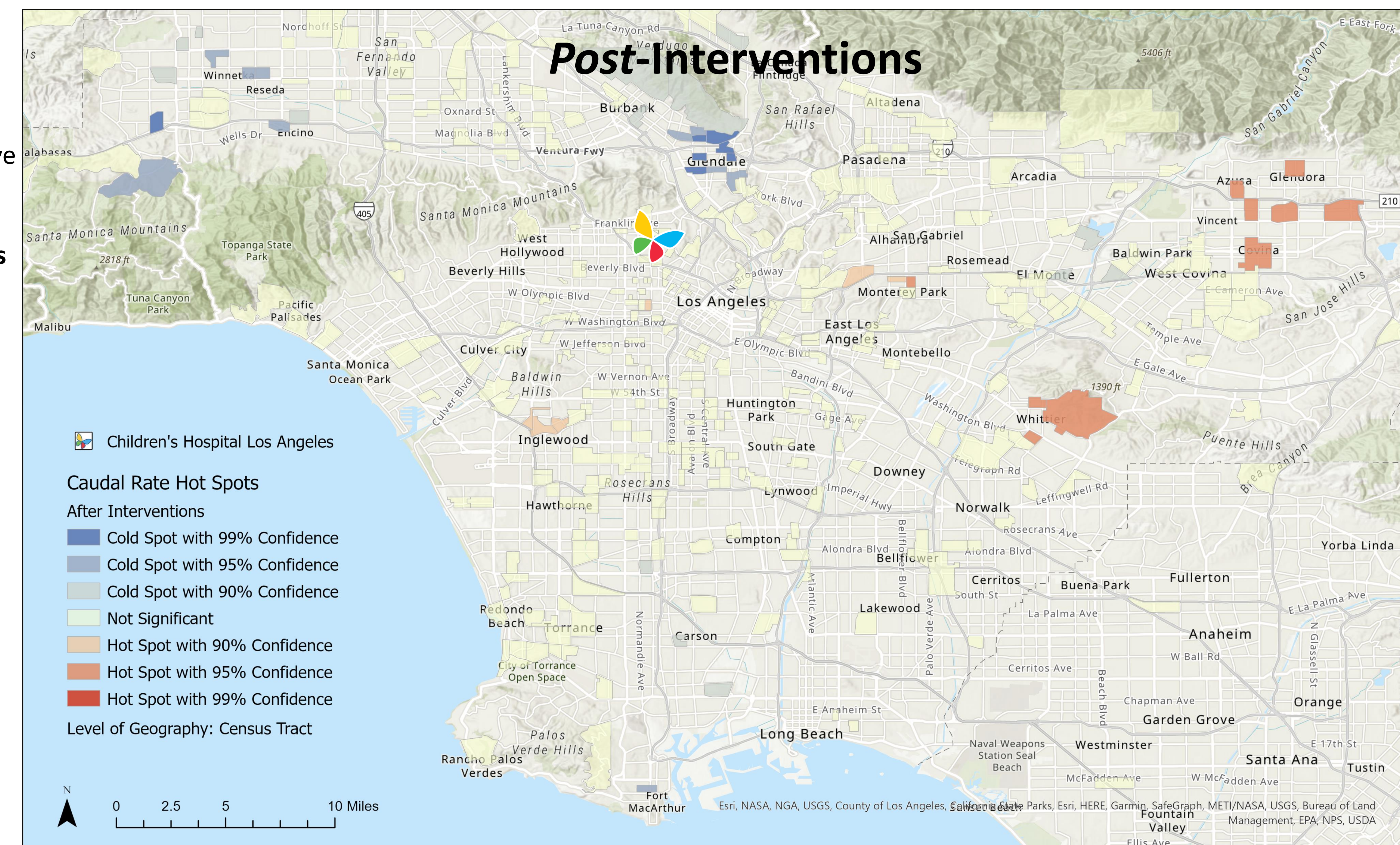
## Pre-Interventions

- Patients receiving a caudal had a median SVI of 0.69 versus 0.75 among children who did not receive a caudal (p=0.011).
- **Children living in areas that were more socially vulnerable were less likely to receive a caudal nerve block.**



## Post-Interventions

- Patients receiving a caudal had a median SVI of 0.73 versus 0.76 among children who did not receive a caudal (p=0.1).
- **There was no difference in SVI among children receiving a caudal or not after the QI initiative.**



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