



BACKGROUND

- Dental caries disproportionately affects socially disadvantaged children at an increasing rate throughout society¹.
- Social vulnerability, measured by the Social Vulnerability Index (SVI) developed by the Center for Disease Management and Control (CDC), has been used to quantify social determinants of health and evaluate communities at high risk for poor health outcomes^{2,3,4}.
- This retrospective cross-sectional study aims to compare SVI data with dental caries outcomes in children to gain quantitative insight on how dental caries outcomes in children are influenced by their social vulnerability.

METHODS

- Study Population:** Electronic dental record data along with associated Social Vulnerability Index (SVI) of all children (0-18 years) reporting for a dental examination at the Children's Hospital Colorado in 2020 was extracted and de-identified for this study.
- Outcomes:** Exam with a new caries diagnosis and exam without a new caries diagnosis
- Independent Variable:** SVI Overall Percentile along with 19 other SVI categories used to calculate the overall percentile (i.e. SVI Socioeconomic Percentile, SVI Estimated % Below Poverty, SVI Estimated % Crowding, and more)
- Covariates:** Age, Sex, and Race/Ethnicity (White, Hispanic/Latino, African American/Black, Asian, American Indian/Alaska Native, more than one race)
- Statistical Analysis:** Logistic regression was performed for the effect of SVI, treated both continuously and categorically, on the presence (n=4900) or absence (n=4301) of caries as a new visit diagnosis, was adjusted for age, sex, ethnicity, and race.

RESULTS

	Exam Without New Dx (N=4301)	New Caries Dx (N=4900)	Total (N=9201)	P value
SVI Overall Percentile				< 0.001
Mean (sd)	59.1 (29.8)	62.0 (29.1)	60.7 (29.4)	
Median (Q1,Q3)	63.6 (38.5, 87.0)	64.3 (38.5, 87.0)	63.6 (38.5, 87.0)	
Min	0.3	0.3	0.3	
Max	98.5	99.0	99.0	
Overall SVI Percentile Categories				< 0.001
SVI Percentile ≤25	754 (17.5%)	730 (14.9%)	1484 (16.1%)	
SVI Percentile 26-50	959 (22.3%)	989 (20.2%)	1948 (21.2%)	
SVI Percentile 51-75	838 (19.5%)	994 (20.3%)	1832 (19.9%)	
SVI Percentile >75	1750 (40.7%)	2187 (44.6%)	3937 (42.8%)	

Table 1. SVI Overall Percentile by visit type

- Patients with a new caries diagnosis had a greater mean Overall SVI percentile (62.0, SD=29.1) compared to patients without a new caries diagnosis (59.1, SD=29.8) (p<0.001).

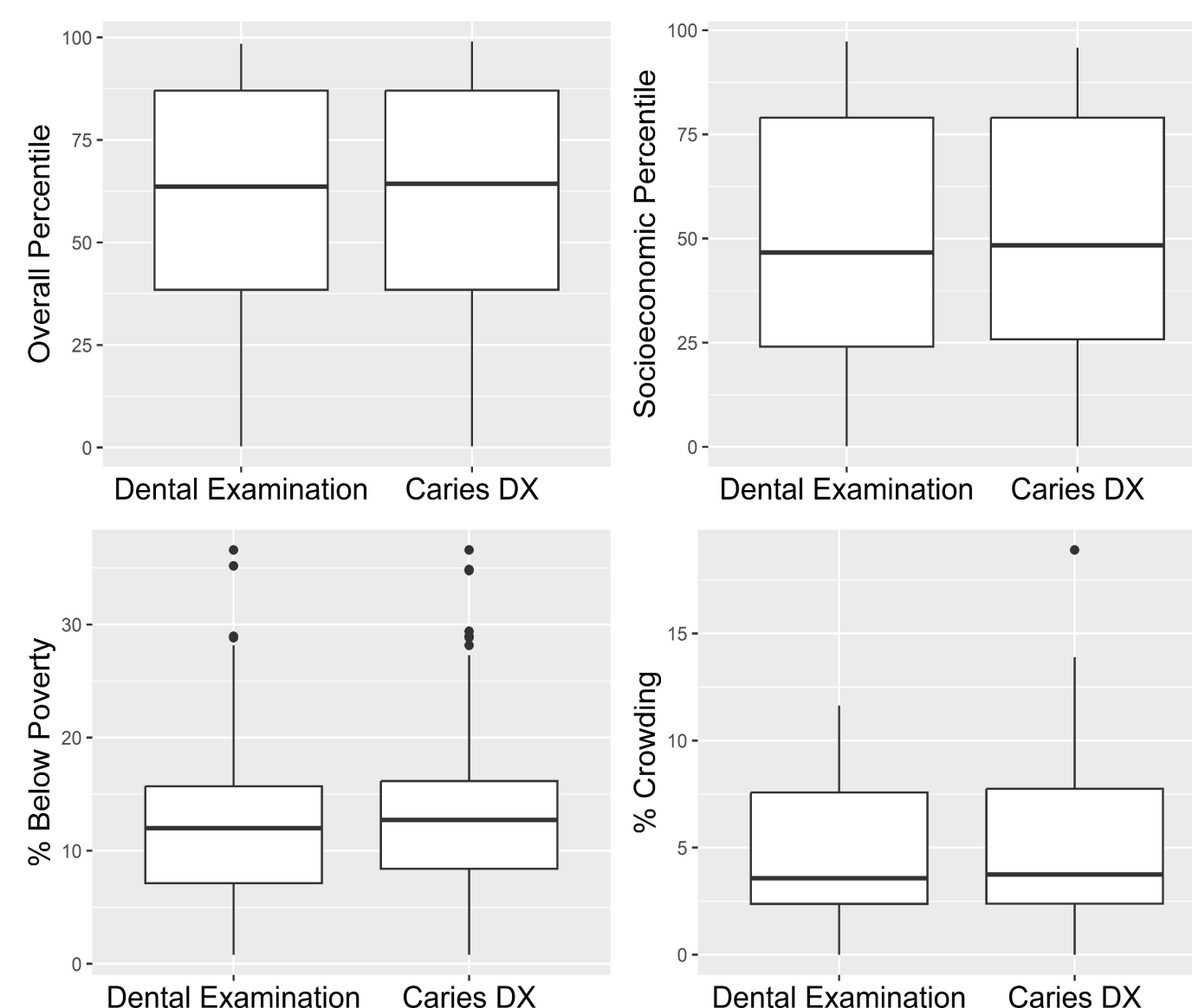


Figure 1. Boxplot of the distribution of the SVI components significant in the logistic regression for a new caries diagnosis at an alpha level of 0.0025.

SVI Category	OR (95% CI)	P Value
SVI Overall Percentile	1.027 (1.012, 1.042)	0.0004
SVI Socioeconomic Percentile	1.025 (1.011, 1.041)	0.0008
SVI Estimated % Below Poverty	1.148 (1.066, 1.236)	0.0003
SVI Estimated % Crowding	1.234 (1.08, 1.41)	0.002
SVI Estimated % with a Disability	1.371 (1.148, 1.639)	0.0005
SVI Housing Type and Transportation Percentile	1.028 (1.014, 1.043)	0.0001

Table 2. Adjusted logistic regression results (N = 9201) for the effect of a 10 unit increase in SVI categories on Caries visit type, with significance level (alpha) set at 0.0025

- With each 10-point increase in the Overall SVI percentile, having a new caries diagnosis visit was 2.7% more likely compared to having a visit without a new caries diagnosis (OR 1.027, 95% CI 1.012- 1.042; p = 0.0004).

Percentile Category	OR (95% CI)	p value	Overall p value
SVI Overall Percentile 26-50	1.07 (0.933, 1.227)	0.3341	0.0015
SVI Overall Percentile 51-75	1.231 (1.071, 1.416)	0.0034	
SVI Overall Percentile >75	1.236 (1.089, 1.402)	0.001	

Table 3. Adjusted logistic regression model estimates for percentile cutoffs of overall SVI in reference to SVI percentile ≤25

- There is a significant difference in the odds of a caries diagnosis by Overall SVI percentile category after adjusting for age, sex, race and ethnicity of the child (p = 0.002). Those with an Overall SVI percentile between 51-75 were 23% more likely to have a new caries diagnosis compared to those with a percentile ≤25 (OR 95% CI 1.07, 1.42; p = 0.003), and those with a percentile >75 were 23.6% more likely to have a caries diagnosis compared to those with a percentile ≤25 (OR 95% CI 1.09, 1.40; p = 0.001).

CONCLUSIONS

- Children living in more socially vulnerable areas were more likely to have a new caries diagnosis at their dental exam.
- This is especially true for children living in the most vulnerable communities (>50 percentile).

IMPLICATIONS

- SVI can be used to quantify patients' social determinants of health and their impact on dental outcomes.
- With more studies, SVI could be used to better understand and estimate patient's caries outcomes and/or risk.

DISCLOSURES

- This research study received no external funding.
- Support was provided by the Center for Research in Outcomes in Children's Surgery, Children's Hospital Colorado, University of Colorado School of Medicine.
- There were no conflicts of interest.

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