Dentists Distribution and Dental Caries among 3rd-Grade Children: Spatial Difference in Oral Health

Zahra Alhay MPH, Karla Finnell PhD, Amanda Janitz PhD, Sixia Chen PhD, and Lancer Stephens PhD
The University of Oklahoma Health Sciences Center, College of Public Health; Oklahoma City, Oklahoma

Introduction

- In Oklahoma, children experience higher rates of dental caries than the national average
- The prevalence of dental caries among 3rd-grade children is 67%, accounting for both treated & untreated caries
- Many children cannot access dental care due to workforce shortages, financial barriers, being uninsured, and several other reasons
- Majority of Oklahoma's 77 counties are considered as DHPSA that limit the accessibility and utilization of preventive care services

Objective

- Examine the availability of Medicaid-enrolled dentists in Oklahoma counties with a high prevalence of dental caries to identify areas of need for population-based oral health interventions

Materials and Methods

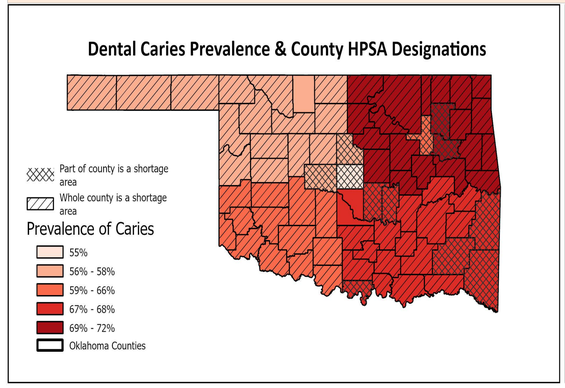
- **Design:** Secondary Analysis
- **Data Sources:**
  - Oklahoma State Department of Health Oklahoma Oral Health Needs Assessment Data during the school years of 2012-2013, 2015-2016, and 2022-2023
  - Oklahoma Health Care Authority is the source of enrolled dentists during 2012-2013, 2015-2016, and 2022-2023 by state fiscal year
  - Oklahoma Health Professional Shortage Areas (OkHPSA) 2023
- **GIS mapping: Outcome** is dental caries prevalence among 3rd grade children in Oklahoma by region & **Exposure** is dentists with active preventive claims/ DHPSA by county
- **Analysis:** Cluster analysis:
  - Global Moran's I statistics
  - Local Moran's I & Getis-Ord Gi*

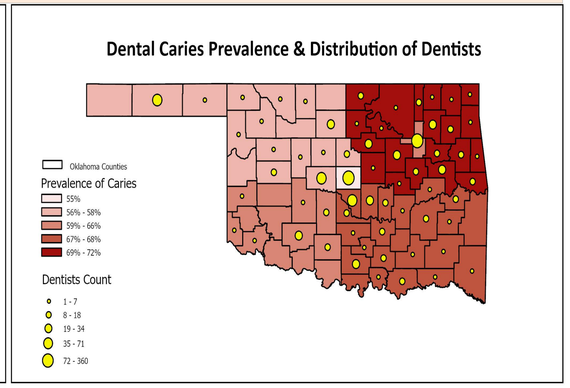
Results

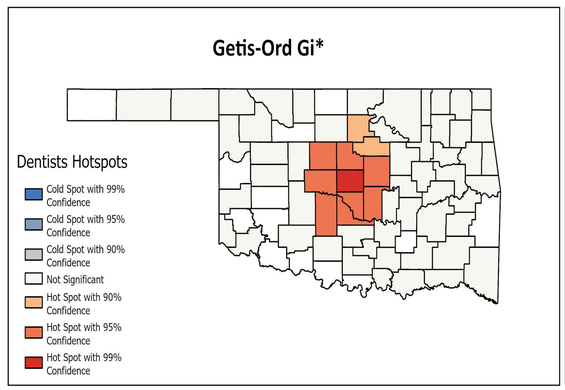
Table 1: Descriptive Summary of 3rd-Grade Children (N=3759)

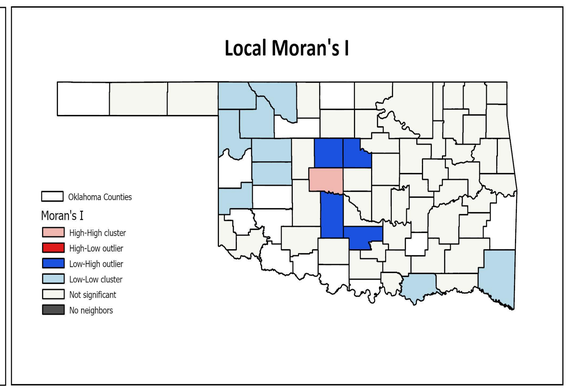
Variables	n (%)	Variables	n (%)
Age		**Race**	
7	3 (1%)	Asian	64 (2%)
8	1644 (44%)	Black	437 (11%)
9	1823 (49%)	Native American	453 (12%)
10 -11	194 (5%)	Other	266 (7%)
		White	2299 (61%)
Gender		**Region**	
Female	1843 (49%)	Northeast	614 (16%)
Male	1860 (49%)	Northwest	530 (14%)
Ethnicity		Southeast	518 (14%)
Hispanic	850 (23%)	Southwest	593 (16%)
Non-Hispanic	2337 (62%)	Oklahoma County	965 (26%)
Unknown	208 (6%)	Tulsa County	539 (14%)

Maps: Dental Caries Prevalence among 3rd-Grade Children by Region and Cluster Analysis of Dentists with Active Preventive Dental Claims in Oklahoma Counties









Global Clustering Results

- Random pattern, z-score of (0.8133) & p-value of (0.4160)

Conclusions

- Strong correlation between higher caries prevalence HPSA designations
- Eastern part of Ok have higher caries prevalence
- Counties with higher density of dentists tend to have lower caries prevalence
- A clear hot spot and significant cluster of dentists in central Ok
- Other parts experience clustering of low dentist density
- Dentists' availability impacts children's oral health status

Public Health Implications

- Geographical disparities in dental care access across OK
- Need of preventive interventions for underserved areas
- Policy makers should utilize geographical info in making idecision regarding the distribution of dental care resources

Literature Cited

- OOHC. Oklahoma Oral Health Report Card 2023. Oklahoma Oral Health Coalition. Accessed 12/1/2024, http://www.oohc.org/custom_files/Okla_Oral_Health_Report_Card_2023.pdf
- RHIhub. Health Professional Shortage Areas: Dental Care, by County, 2024 - Oklahoma. Rural Health Information Hub. Accessed 4/18/2024, https://www.ruralhealthinfo.org/charts/9?stat=OK

Further Information

Reach me at Zahra-Alhay@ouhsc.edu if you have any questions or comments.