Comparative Analysis of Dental Care Utilization of Individuals Aged 1-18 Years in Seven Rural and Seven Urban Counties in California: 2013-2021

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Introduction

- Dental care utilization refers to the percentage of the population accessing dental services within a specific period.
- From 2019 to 2020, the percentage of children aged 1–17 years who had a dental exam or cleaning in the past 12 months decreased from 83.8% to 80.9%.
- Annual exams and cleanings dropped for children aged 1–4 and 12–17 years. Those in families earning below 400% of the federal poverty level were less likely to have had a dental exam or cleaning in 2020 compared to 2019..
- Annual dental examinations and cleanings among children aged 1–17 years declined during this 2-year period in the Northeast (85.8% to 79.9%) and the South (82.8% to 79.4%) of the United States.

Objectives

This study analyzed dental care utilization trends in California (2013–2021), focusing on rural-urban differences, disparities, racial/ethnic variations, and age group differences.



Methods and Materials

Using California Department of Health Care Services data, dental care utilization was analyzed across seven rural and seven urban counties. Descriptive statistics and multiple linear regression examined the relationship between demographic factors and utilization..

Study design: Cross-sectional study.

Study population: The study population includes children and adolescents (ages 1–18) residing in rural (Trinity, Humboldt, Modoc, Mendocino, Shasta, Tehama, Siskiyou) or urban (San Francisco, Santa Clara, Orange, San Bernardino, Alameda, San Mateo, Sacramento) California counties, eligible for Medi-Cal from 2013 to 2021.

Results

- Dental care utilization remained stable from 2013 to 2015, averaging 40.6% in rural areas and 40.7% in urban areas.
- Utilization rates fluctuated in later years, notably impacted by the COVID-19 pandemic in 2020.
- Disparities emerged among racial/ethnic groups: AI/AN and NH/PI populations had higher utilization in rural areas, while Asians and Hispanics had higher rates in urban areas.
- Children aged 6–9 consistently had the highest utilization, particularly in urban settings.
- Statistical analysis found significant differences in utilization by location, race/ethnicity, and year. Interestingly, rural areas had higher utilization than urban areas, with a statistically significant difference.

Table 1: "Percentage (%) of Dental Care Utilization by Demographic Characteristics in Rural and Urban Counties (2013-2021)"

	Rural Counties	Urban Counties	Mean
Year	**Dental care utilization – %**		
2013-2015	40.5	40.7	40.6
2016-2018	44.6	42.3	43.2
2019-2021	40.7	42.0	41.5
Race/Ethnicity			
American Indian/Alaskan Native	49.7	38.4	43.9
Asian	48.1	52.8	52.0
Black	43.2	37.8	39.1
Hispanic	47.7	51.3	49.7
Native Hawaiian/Pacific Islander	49.7	40.6	41.1
White	36.7	32.7	34.7
Others	38.0	39.4	39.2
Unknown	35.2	37.7	36.4
Age Group			
1-2 Ages	25.9	25.9	25.9
3-5 Ages	44.3	44.9	44.7
6-9 Ages	48.9	50.4	49.8
10-14 Ages	44.7	44.6	44.7
15-18 Ages	39.0	37.7	38.2

Table 2: Percentage (%) of Dental Care Utilization in one urban (San Francisco) and one rural (Trinity) County by Year, Race/Ethnicity, and Age Group (2013-2021)

	San Francisco County	*Trinity County*
Year	**Dental care utilization - %**	
2013-2015	46.2	27.5
2016-2018	48.9	34.8
2019-2021	46.4	31.9
Total	47.2	31.2
Race/Ethnicity		
American Indian/Alaskan Native	No Data	No Data
Asian	63.9	No Data
Black	38.1	No Data
Hispanic	57.7	42.7
Native Hawaiian/Pacific Islander	44.9	No Data
White	33.4	29.8
Others	44.2	No Data
Unknown	37.6	26.2
Age Group		
1-2 Ages	37.6	10.2
3-5 Ages	52.6	26.9
6-9 Ages	55.5	35.0
10-14 Ages	48.8	37.3
15-18 Ages	40.2	29.0

Table 3: "Percentage of Dental Care Utilization by County in California (2013-2021)"

	Dental care utilization - %			
	Year			
County	**2013-2015**	**2016-2018**	**2019-2021**	**Mean**
Urban				
Alameda	41.7	42.0	41.0	41.6
Orange	44.1	45.1	46.6	45.6
Sacramento	32.2	36.8	38.4	35.8
San Bernardino	40.5	43.6	42.9	42.3
San Francisco	46.2	48.9	46.4	47.2
San Mateo	37.2	38.0	38.6	37.9
Santa Clara	43.5	42.3	40.3	42.1
Rural				
Humboldt	38.5	43.5	40.4	40.9
Mendocino	45.6	48.4	44.8	46.3
Modoc	42.8	44.8	43.8	43.8
Shasta	38.7	43.8	38.4	40.4
Siskiyou	34.8	39.2	38.2	37.4
Tehama	49.8	51.9	45.6	49.2
Trinity	27.4	34.8	31.8	31.2

Conclusion/Discussion

- ❖ Dental care utilization increases with age.
- ❖ Non-white populations show significantly higher utilization rates than white populations. From 2013–2018, utilization improved in both rural and urban counties.
- ❖ Utilization declined in 2019–2021, likely due to COVID-19, with rural counties maintaining better rates than urban ones.
- ❖ Age, race/ethnicity, year, and location are key predictors of utilization, highlighting the need for targeted interventions by age group.
- ❖ California's oral health plan targets 48% preventive visits among Medicaid children (ages 0–20). Only Tehama (49%) and San Francisco (49%) met the target in 2016–2018.
- ❖ Rural counties showed higher utilization than urban ones, likely due to local oral health programs offering school-based screenings equally in both areas through Kindergarten Oral Health Assessments (KOHAs).
- ❖ The study stresses the need for targeted interventions to reduce disparities, promote preventive care among vulnerable groups, and enhance access in rural areas.
- ❖ Policy efforts should focus on advancing oral health equity, especially for underserved communities in California.

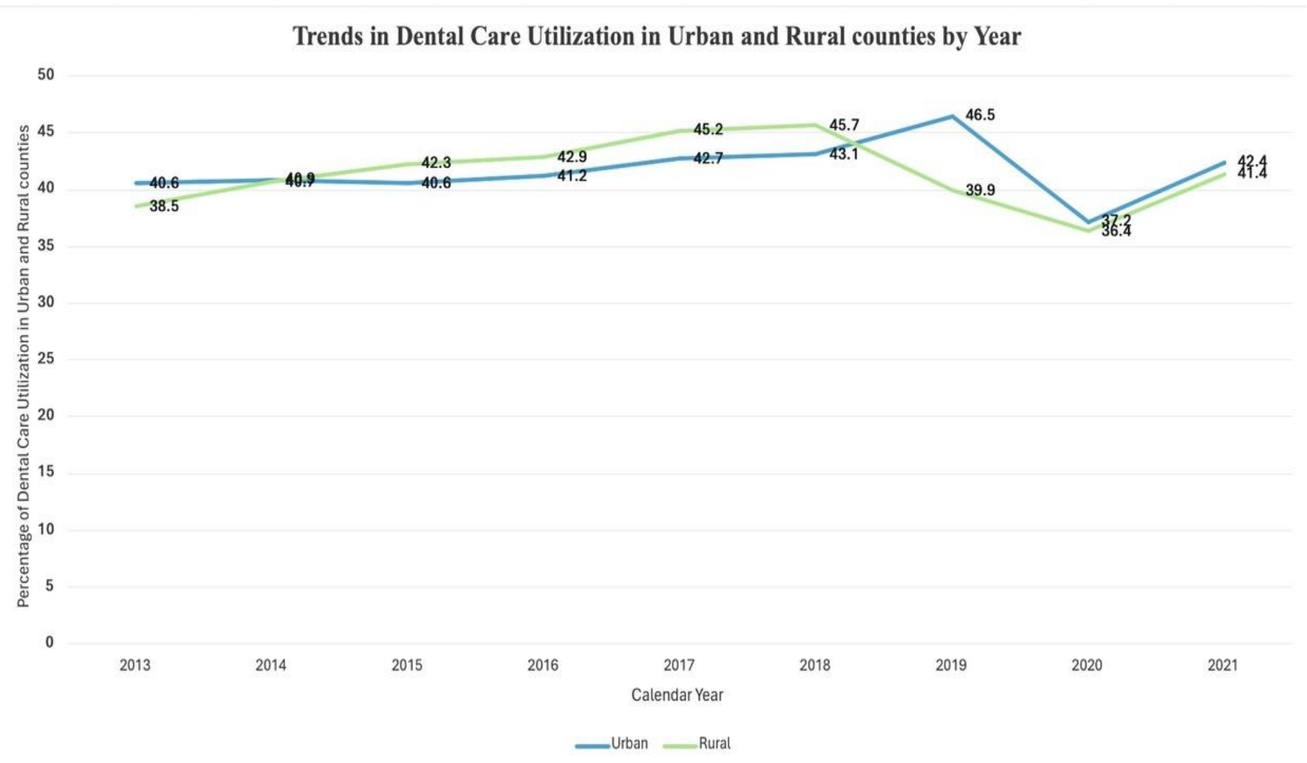

Table 4: Results of Multiple Linear Regression Analysis Examining the Impact of Age, Race, Year, and County Type on the Dental Care Utilization

Dental Care Utilization	Coefficient	Std.Error	t value	P value	(95% confidence intervals)
Age Category					
3-5 Years	0.19	0.085	41	<0.0001	(0.18, 0.20)
6-9 Years	0.248	0.085	52.27	<0.0001	(0.23, 0.25)
10-14 Years	0.188	0.085	41.07	<0.0001	(0.18, 0.20)
15-18 Years	0.124	0.005	26.77	<0.0001	(0.11, 0.13)
Year Category					
2016-2018	0.024	0.005	7.18	<0.0001	(0.02, -0.00)
2019-2021	0.085	0.005	1.52	0.129	(0.03, 0.01)
Race Category					
Black	0.003	0.005	7.45	<0.0001	(0.03, 0.02)
Asian	0.003	0.005	31.3	<0.0001	(0.16, 0.15)
Hispanic	0.039	0.005	34.05	<0.0001	(0.15, 0.07)
Alaska Native or American Indian	0.168	0.005	15.25	<0.0001	(0.08, 0.04)
Native Hawaiian or Pacific Islander	0.156	0.005	10.19	<0.0001	(0.05, 0.06)
Other	0.08	0.005	9.24	<0.0001	(0.04, 0.03)
Unknown	0.054	0.005	3.99	<0.0001	(0.01, 0.03)
County type					
Urban	-0.007	0.003	-2.42	0.015	(-0.01, 0.17)

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