



Rural vs. Urban Patterns of Dental Care Services and Outcomes among Medicaid-Enrolled Children in Early Childhood

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Key Points:

- The majority of rural children did not receive two dental cleanings per year as recommended by the American Academy of Pediatric Dentistry (2021: 85.9%, 2022: 78.8%). Most suburban (2021: 86.4%, 2022: 79.0%) and urban children (2021: 86.8%, 2022: 79.6%) did not receive two dental cleanings per year.
- Rural children had more restorative dental services (i.e., fillings and crowns) per year (2021: 12.6%, 2022: 19.5%) than suburban (2021: 10.9%, 2022: 17.3%) and urban (2021: 10.4%, 2022: 16.6%) children.
- Rural children had the highest incidence of caries (i.e., tooth decay) diagnosed per year (2021: 4.4%, 2022: 5.2%) when compared to suburban (2021: 4.1%, 2022: 4.9%) and urban (2021: 3.6%, 2022: 3.4%) children.

INTRODUCTION

In the United States, dental caries is the most prevalent chronic disease of childhood with an estimated 11.1% of American children aged 2-5 years old with caries from 2017-March 2020, disproportionately impacting low-income children with a higher prevalence rate of 18.0%.¹⁻³ Children up to age 5 are especially vulnerable to dental caries (i.e., tooth decay) due to diet, environmental factors, and hygiene practices. The disease is associated with abscesses, local pain, and infections which can lead to further complications like difficulty chewing, malnutrition, gastrointestinal conditions, and sleep disorders.^{4,5} Development of caries early in life also increases the likelihood of dental decay throughout later childhood and adulthood.⁵

Rural-urban differences in early childhood oral health are driven by multiple factors, with

Fisher-Owens describing the ecological model of oral health,⁶ where the availability of dentists willing to treat young children impacts their ability to utilize preventive dental care. In 2023, there were 7,306 Dental Health Professional Shortage Areas (HPSAs), 67% of which are in rural areas.⁷ Even in areas with dentists present, there may be no dental providers accepting patients insured by Medicaid or taking new patients insured by Medicaid due to low reimbursement rates, in comparison to private insurance.⁸ In 2017, the American Dental Association office database showed that among 132,612 dentists nationwide, only around 5.6% (n=7,616) practiced in rural areas and only around half of those rural providers had a record of seeing any Medicaid patients during the year.⁸ Additionally, prior studies show that nearly half (47%) of rural children are insured by Medicaid compared to 40% of urban children,⁹ creating a disproportionate rural need for dental providers willing to serve the pediatric CHIP and Medicaid-insured population.

Previous studies examining rural-urban differences in dental service use and oral health outcomes are dated, limited to a certain region, or focus on self-reported oral health outcomes rather than actual caries diagnoses.^{1,3-5,10,11} A nationally representative study on rural-urban differences in early childhood caries and use of preventive dental visits is needed and essential to inform the development of targeted interventions and resources for early detection and management of early childhood caries. Particularly, this study focuses on children with Medicaid who have historically been less likely to receive preventive dental care with subsequent impacts on pain, infections, and overall development.¹ This brief reports rural vs. urban patterns of preventive, restorative or surgical dental

services, and incidence rates of dental caries in 2021 and 2022 among Medicaid-enrolled children ages 2 to 5.

Outcomes were presented separately for 2021 and 2022 as overall healthcare use, including dental services, declined during the COVID-19 pandemic and showed signs of recovery to pre-pandemic patterns through 2022.^{12,13} Previous literature has also shown that noted declines in dental service use during the COVID-19 pandemic differed between urban and rural populations, where people living in urban areas were more likely to delay dental care than those living in rural areas.¹⁴ Capturing the significance of underutilized preventive dental services during the COVID-19 pandemic is additionally useful insight for examining future dental care needs.

METHODS

This project used national Medicaid dental claims for January 1, 2021, through December 31, 2022, for children from the Centers for Medicare & Medicaid Services (CMS) Chronic Conditions Data Warehouse (CCW).¹⁵ The CMS CCW provides national data on Medicaid enrollees and healthcare related claims for health policy, quality of care, and cost-related analyses.¹⁵

Children enrolled in Medicaid aged 2 to 5 with a full 24 months of continuous coverage and residents of the contiguous US, Alaska, and Hawaii were included in analyses. Of 9,320,692 eligible children, 195,359 (2.1%) were excluded if missing ID number (n=186,337), missing age (n=8,447), missing state of residence (n=400), missing ZIP code (n=158), or died (n=17) for a final total of 9,125,333 children.

Preventive Services: Dental care service use was measured by the frequency per year of overall preventive services and cleanings/prophylaxis. Preventive visits were identified using Codes on Dental Procedures and Nomenclature (CDT). A child was regarded as having a preventive visit if a claim had one or more of the CDT codes associated with preventive dental services including prophylaxis, oral evaluations, application of topical fluoride, or dental sealants placement (Appendix Table 1). We also captured the number of cleaning services per year according to the American Academy of Pediatric Dentistry's (AAPD)

recommendations of two per year, preferably at six-month intervals.¹⁶

Restorative or Surgical Services: The individual-level frequency of restorative or surgical visits was determined using CDT codes. Restorative or surgical visits were a categorical variable including any services for the restoration of the teeth (i.e., fillings and/or crowns), periodontics, endodontics, or oral surgery.

Caries Diagnosis: Individual diagnoses of early childhood caries were determined via International Classification of Diseases, 10th Revision, Clinical Modification (ICD-10) codes. Participants with an ICD-10 code associated with a caries diagnosis were identified as having early childhood caries. If the participant did not have one of these codes, they were labeled as not having a caries diagnosis. ICD-10 diagnosis codes to identify caries and CDT codes to identify preventive and restorative or surgical services are further summarized in Appendix Table 1.

Rurality was defined at the ZIP code tabulation area with 2020 Rural Urban Commuting Areas (RUCA) classifications to examine patterns of dental services use across the rurality continuum.¹⁷ RUCA codes were also collapsed to create three levels of rurality: codes 1-3 grouped as metropolitan, codes 4-6 grouped as micropolitan, and codes 7-10 grouped as rural. Changes to home ZIP code within the year are not captured within the data as CMS only reports the last known address for each calendar year. Therefore, we are unable to determine if children within the study may have relocated from a rural to urban area or vice versa within the year.

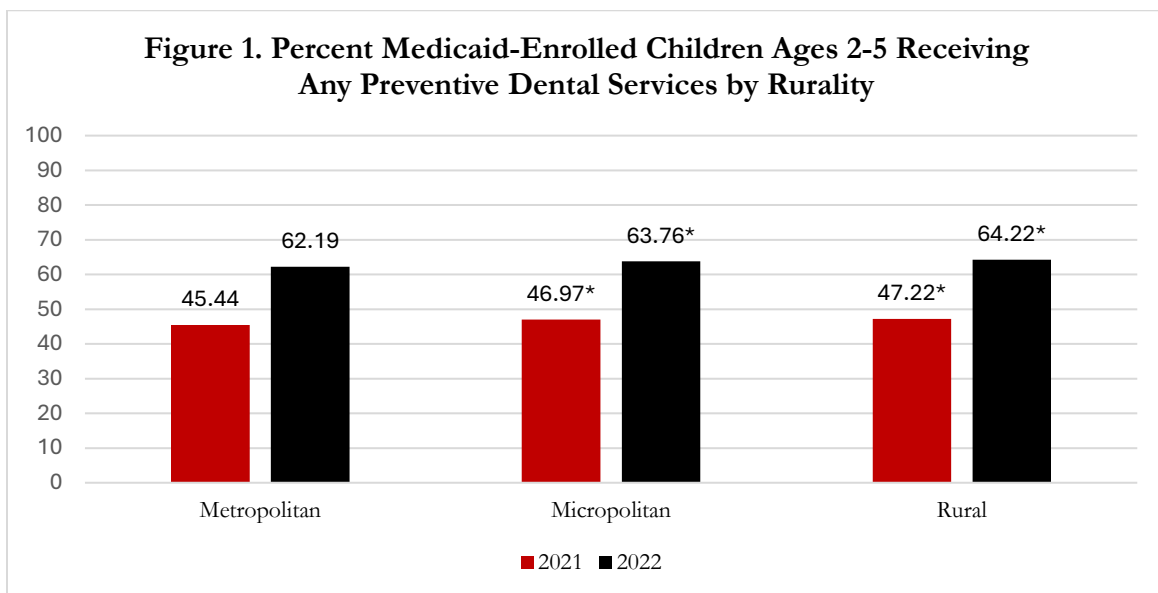
To compare the study population, we included the following sociodemographic characteristics: age, sex, race and ethnicity, family income level, and census region. Approximately 22% of records had missing race and ethnicity and around 35% had missing family income. These missing groups were retained in the study as they accounted for a large proportion of the total study population and were not part of the inclusion criteria. Demographic information for the full study population is reported in Appendix Table 2.

Rural-urban differences were compared with a significance level of $\alpha=0.05$ for the frequency of preventive dental services, restorative or surgical dental services, and caries diagnosed per 100,000.

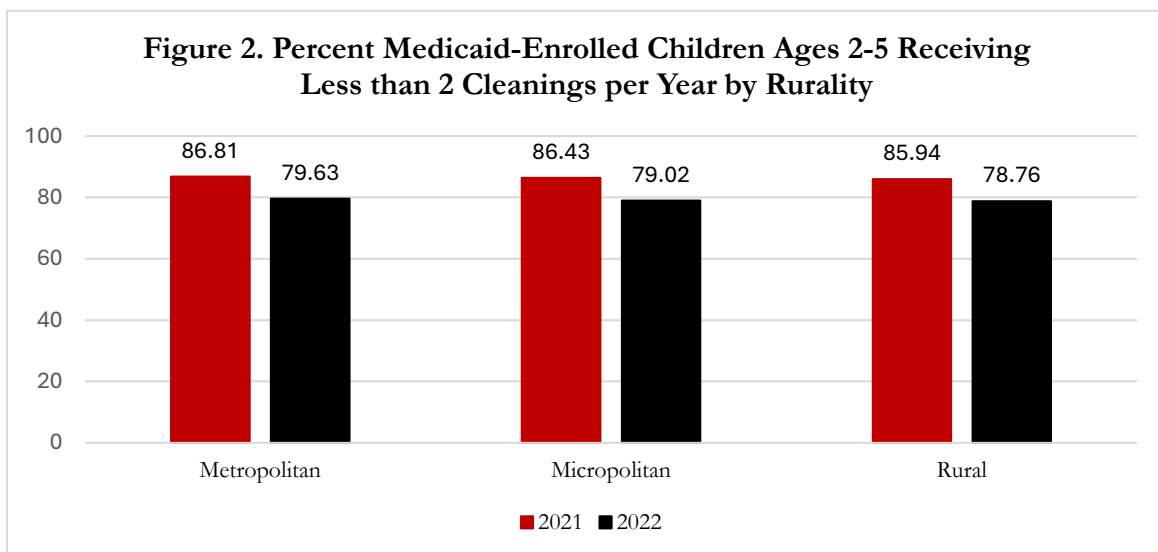
FINDINGS

USE OF DENTAL PREVENTIVE SERVICES PER YEAR BY RURALITY AMONG MEDICAID-ENROLLED CHILDREN AGES 2-5, 2021-2022

In 2021, less than half (45.75%) of all children received any preventive dental services. In 2022, this increased to 62.5% for all children. There was around a 2-percentage point difference between rural and metropolitan children receiving any preventive dental services in 2021 and 2022 with rural children at 47.22% and 64.22%, respectively (Figure 1). In comparison, metropolitan children had preventive use rates of 45.44% in 2021 and 62.19% in 2022. Preventive dental services include prophylaxis/cleanings, oral evaluations, radiography (e.g., x-rays, CT scans), fluoride treatments, or sealants. Few children received the recommended number of two prophylaxis or cleaning services per year across rurality. Among rural children, 85.94% did not receive two cleanings in 2021, and 78.76% did not receive two cleanings in 2022 (Figure 2). Rates of cleanings were similar for metropolitan and micropolitan kids when compared to rural kids. The full summary of preventive dental services is available in Appendix Table 3.



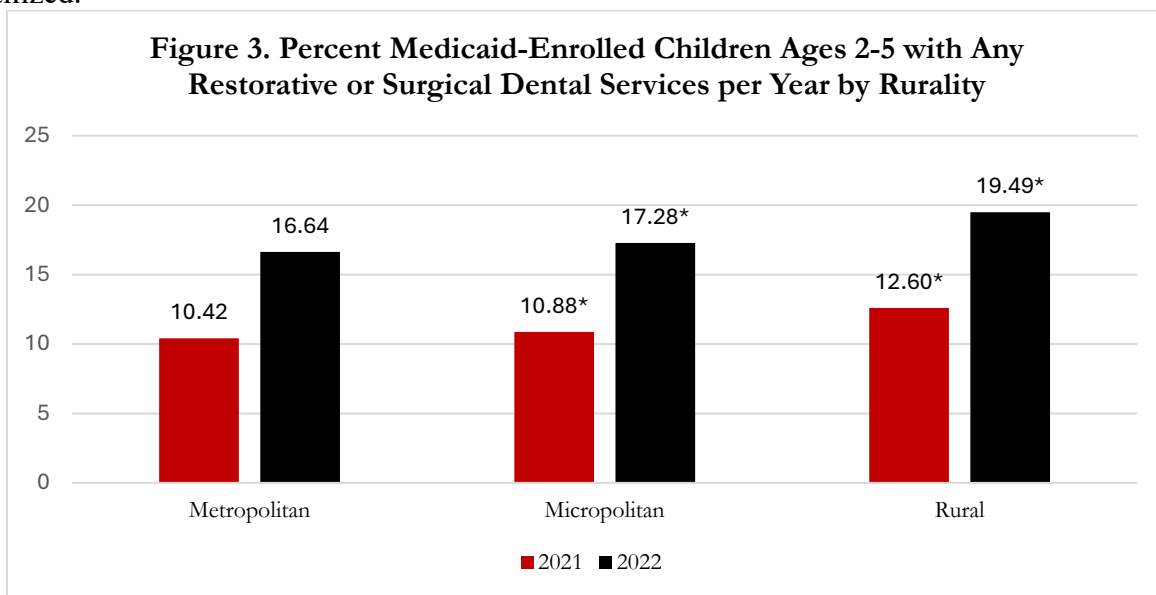
*Significantly different from Metropolitan at $\alpha=0.05$



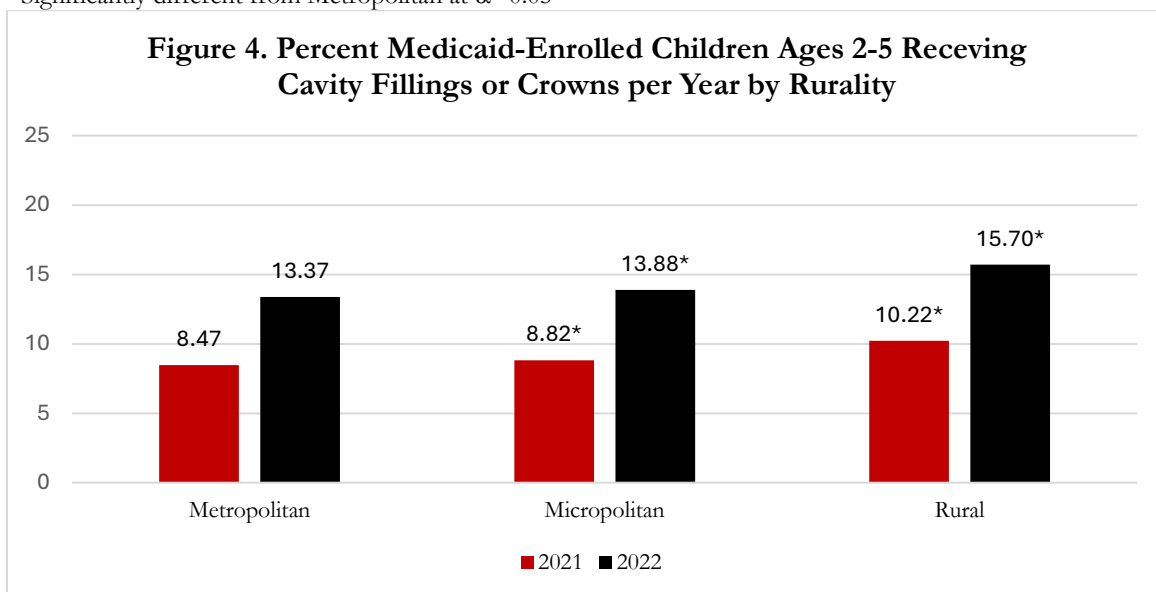
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USE OF RESTORATIVE OR SURGICAL DENTAL SERVICES PER YEAR BY RURALITY AMONG MEDICAID-ENROLLED CHILDREN AGES 2-5, 2021-2022

Rural children had the highest rates of restorative or surgical dental services per year in comparison to metropolitan and micropolitan children for both years examined. These restorative or surgical services included fillings, crowns, extractions, periodontic and endodontic procedures, and other oral surgeries. In 2021, 12.60% of rural kids received restorative or surgical dental services compared to 10.88% of micropolitan kids and 10.42% of metropolitan kids. Overall restorative or surgical services were higher in 2022 than 2021 among all children but remained significantly higher among rural children compared to their micropolitan and metropolitan counterparts. In fact, around 1 in 5 rural children ages 2-5 (19.49%) received restorative or surgical dental services in 2022 compared to 17.28% of micropolitan and 16.64% of metropolitan children (Figure 3). Cavity fillings or crowns accounted for the majority of these services each year and were significantly higher among rural children (Figure 4). As previously mentioned, rates of dental treatment services may more accurately reflect dental decay and related conditions versus diagnostic codes for caries which may be underutilized.



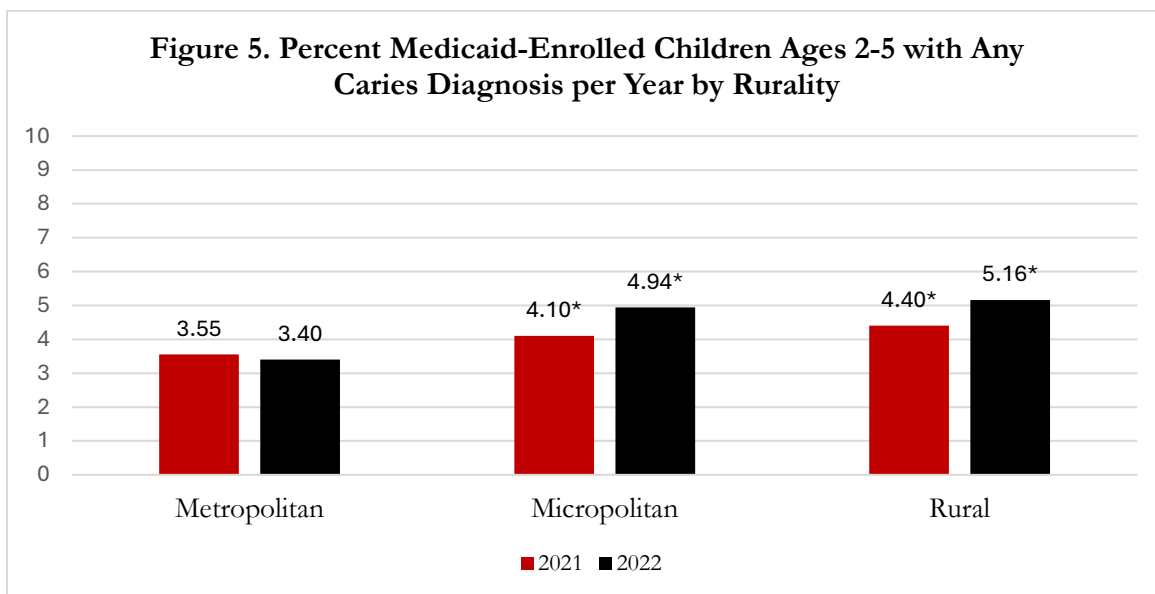
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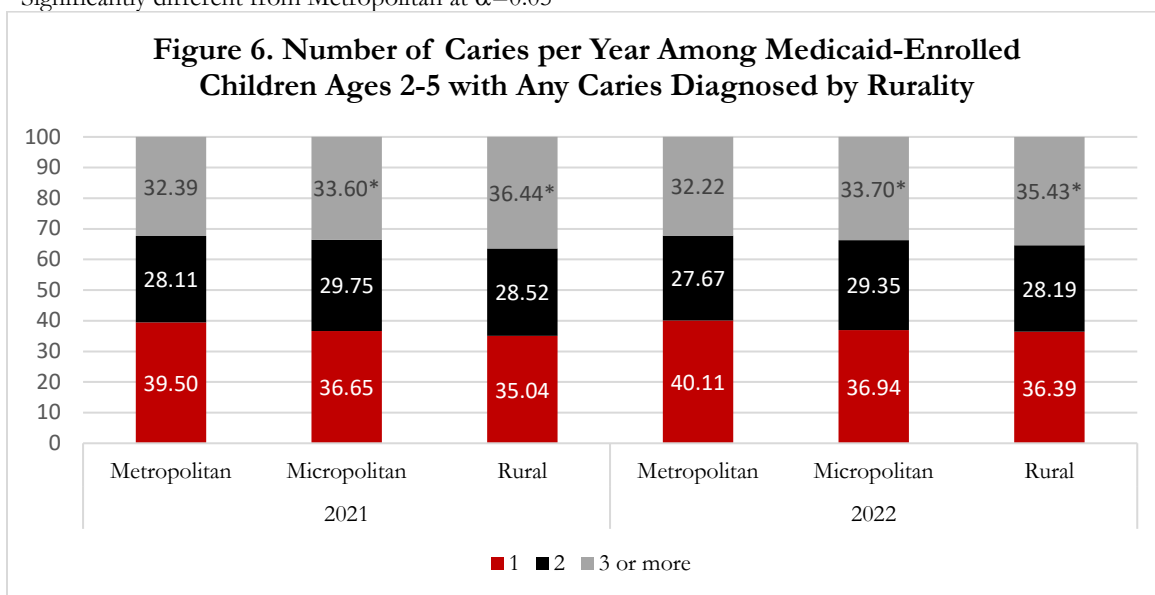
*Significantly different from Metropolitan at $\alpha=0.05$

INCIDENCE OF DENTAL CARIES PER YEAR BY RURALITY AMONG MEDICAID-ENROLLED CHILDREN AGES 2-5, 2021-2022

Rural children aged 2-5 had the highest incidence rates of dental caries for both 2021 and 2022. In 2021, 4.40% of rural children on Medicaid had at least one caries diagnosis compared to 3.55% of metropolitan and 4.10% of micropolitan children on Medicaid (Figure 5). When examining the number of caries per child among those with a caries diagnosis, rural children had the highest proportion of those with 3 or more caries per year in 2021 at 36.44% (Figure 6). In 2022, the same trend was present with rural children having a higher proportion of 3 or more caries at 35.43% of rural children compared to 32.22% in metropolitan and 33.70% in micropolitan kids. However, diagnoses of caries may be underutilized and therefore underrepresent those with active tooth decay in comparison to rates of dental treatment services to restore dental cavities and related conditions. The full summary of the numbers of caries diagnoses is available in Appendix Table 3.



*Significantly different from Metropolitan at $\alpha=0.05$



*Significantly different from Metropolitan at $\alpha=0.05$

DISCUSSION

Disruptions to healthcare use, including dental services, during the COVID-19 pandemic have been documented previously,^{13,14} and are also reflected in our findings. Our examination of rural vs. urban dental service use among Medicaid-insured children revealed that an overwhelming majority of rural children did not receive two preventive dental cleaning services per year in 2021 and 2022. Additionally, despite similarly low use of preventive services for all children during this timeframe, rural children had more caries diagnosed and higher use of restorative or surgical services, namely higher rates of fillings and crowns to treat tooth decay, compared to urban and suburban children.

Use of any preventive services in our findings was considerably lower than previously reported by other data sources. Around half of the rural children examined in this study did not receive any preventive dental services in 2021, and over one-third did not receive any preventive dental services in 2022. In 2024, KFF published a data brief using 2021 Medicaid dental claims for all ages (children and adults).¹⁸ For ages 2-5, their results also showed that only 45% of Medicaid enrollees up to age 21 received any preventive dental services. In comparison, parent-reported survey responses to the National Survey of Children's Health showed a much higher rate of 84.9% of rural kids age 6-17 receiving preventive dental care in 2017-2018.³ However, this study did identify low income as a significant risk factor for reducing the likelihood of dental care. Their results showed that children with the lowest categories of family income (which align with Medicaid eligibility income categories) were half as likely to report preventive dental visits in the last 12 months compared to those with family income of 400% of the FPL or above. This finding aligns with the low preventive service use in our study, as around 3% of the children we examined had a reported family income of 200% of the FPL and over. Furthermore, our findings highlight that the pediatric Medicaid-insured population is not receiving preventive dental care at the rate of higher income and privately insured children in both rural and urban areas.

Poor access and low use of preventive dental care in early childhood sets the stage for higher

rates of dental complications and oral disease later in life and moreover increases the demand for restorative dental services and oral surgeries which may have been prevented with better access to care.^{4,5} Our findings revealed that even in early childhood, rural children had the highest rates of caries diagnoses and the highest rates of restorative dental treatments. Rates of dental treatments may be more accurate than caries diagnoses when capturing dental diseases and conditions. Overall rates of caries diagnoses in Medicaid claims were markedly lower than previous studies from survey responses, but rates of restorative dental treatments were similar to previously reported rates. This may indicate that caries diagnostic codes are underutilized in the dental field even in the presence of dental treatment services to address active tooth decay (e.g., cavity fillings and crowns).

Furthermore, despite similarly low use rates of preventive dental services in 2021 and 2022, rural kids had higher rates of fillings and crowns to treat tooth decay than their urban and suburban counterparts. This observation may be reflective of more drastic and prolonged rural differences in accessing preventive dental services that existed before the timeframe of this study,¹⁸ contributing to a higher rural demand for restorative dental treatments.

Low use of preventive dental services among rural children insured by Medicaid may have lasting impacts on the health of this population. Interventions to improve children's use of dental services in rural areas could be multifaceted—addressing access barriers, strengthening the pediatric workforce pipeline, expanding preventive care delivery models, and improving care coordination across medical, dental, school, and community settings.¹⁹ Policy changes that expand the availability of school-based and community-based preventive services can significantly reduce missed opportunities for early intervention.¹⁹

REFERENCES

1. Dental Caries in Children (Age 2 to 11) | Data & Statistics | National Institute of Dental and Craniofacial Research. Accessed October 27, 2025. <https://www.nidcr.nih.gov/research/data-statistics/dental-caries/children#dental-caries-in-the-primary-baby-teeth-children-ages-2-to-5-years>
2. 2024 Oral Health Surveillance Report | Oral Health | CDC. Accessed December 15, 2025. <https://www.cdc.gov/oral-health/php/2024-oral-health-surveillance-report/index.html>
3. Crouch E, Nelson J, Merrell MA, Martin A. The oral health status of America's rural children: An opportunity for policy change. *J Public Health Dent*. 2021;81(4):251-260. doi:10.1111/JPHD.12444
4. Davidson KW, Barry MJ, Mangione CM, et al. Screening and Interventions to Prevent Dental Caries in Children Younger Than 5 Years: US Preventive Services Task Force Recommendation Statement. *JAMA*. 2021;326(21):2172-2178. doi:10.1001/JAMA.2021.20007
5. Anil S, Anand PS. Early Childhood Caries: Prevalence, Risk Factors, and Prevention. *Front Pediatr*. 2017;5:157. doi:10.3389/FPED.2017.00157
6. Fisher-Owens SA, Gansky SA, Platt LJ, et al. Influences on children's oral health: a conceptual model. *Pediatrics*. 2007;120(3). doi:10.1542/PEDS.2006-3084
7. Health Workforce Shortage Areas. Accessed October 27, 2025. <https://data.hrsa.gov/topics/health-workforce/shortage-areas>
8. Nasseh K, Fosse C, Vujicic M. Dentists Who Participate in Medicaid_ Who They Are, Where They Locate, How They Practice. *Medical Care Research and Review*. 2023;80(2):245-252. doi:10.1177/10775587221108751/SUPPL_FILE/SJ-DOCX-1-MCR-10.1177_10775587221108751.DOCX
9. Medicaid's Coverage Role in Small Towns and Rural Areas – Center For Children and Families. Accessed November 16, 2025. <https://ccf.georgetown.edu/2023/08/17/medicaids-coverage-role-in-small-towns-and-rural-areas/>
10. Centers for Disease Control and Prevention. *Trends in Dental Caries and Sealants, Tooth Retention, and Edentulism, United States 1999-2004 to 2011-2016.*; 2019. Accessed July 20, 2025. www.cdc.gov/oralhealth/publications/OHSR-2019-index.html
11. Dye BA, Mitnik GL, Iafolla TJ, Vargas CM. Trends in dental caries in children and adolescents according to poverty status in the United States from 1999 through 2004 and from 2011 through 2014. *Journal of the American Dental Association*. 2017;148(8):550-565.e7. doi:10.1016/j.adaj.2017.04.013
12. Brian Z, Weintraub JA. Oral Health and COVID-19: Increasing the Need for Prevention and Access. *Prev Chronic Dis*. 2020;17:E82. doi:10.5888/PCD17.200266
13. Czeisler MÉ, Marynak K, Clarke KEN, et al. Delay or Avoidance of Medical Care Because of COVID-19–Related Concerns — United States, June 2020. *MMWR Morb Mortal Wkly Rep*. 2022;69(36):1250-1257. doi:10.15585/MMWR.MM6936A4
14. Kranz AM, Gahlon G, Dick AW, Stein BD. Characteristics of US Adults Delaying Dental Care Due to the COVID-19 Pandemic. *JDR Clin Trans Res*. 2020;6(1):8. doi:10.1177/2380084420962778

15. About the Chronic Conditions Warehouse - Chronic Conditions Data Warehouse. Accessed October 27, 2025. <https://www2.ccwdata.org/web/guest/about-ccw>
16. *Policy on the Role of Dental Prophylaxis in Pediatric Dentistry.*; 2024. Accessed October 27, 2025. www.ncbi.nlm.nih.gov/pmc/articles/PMC4000911/
17. USDA ERS - Rural-Urban Continuum Codes. Accessed April 1, 2019. <https://www.ers.usda.gov/data-products/rural-urban-continuum-codes/>
18. Variation in Use of Dental Services by Children and Adults Enrolled in Medicaid or CHIP | KFF. Accessed October 26, 2025. <https://www.kff.org/medicaid/variation-in-use-of-dental-services-by-children-and-adults-enrolled-in-medicaid-or-chip/>
19. Ignelzi M, Brickhouse T, Caffrey E, et al. *Hidden Crisis: Pediatric Oral Health in Rural America.*; 2023. Accessed November 16, 2025. https://www.aapd.org/globalassets/ruralpediatricoralhealth_aapd_rpc.pdf

APPENDIX

Limitations

Limitations related to the structure of Medicaid data should be considered in the interpretations of these results. CMS reports demographic data including residential location based on the last available information for each year. Therefore, changes to rurality may occur during the year and cannot be tracked in the data. The results of this study are also not generalizable to all rural children as we only examined Medicaid-insured children ages 2-5. Results from this study are also reported on the national level and may not reflect variation in rural-urban differences within each state. Additionally, our comparison group for this study was urban/metropolitan children also insured by Medicaid rather than an urban privately insured or mixed insurance pediatric population as used in other studies. Urban Medicaid-insured children also face barriers in accessing dental care when compared to children with private insurance and higher family income levels. Therefore, rural vs. urban differences in the total population of children would likely be of greater magnitude compared to somewhat modest rural-urban differences observed in this study. Lastly, with any study using longitudinal data, there is the potential for administrative censoring. We cannot capture dental services occurring outside of our observation period from January 2021 to December 2022.

Appendix Table 1. Dental Diagnostic, Procedure and Services Codes

Coding System	Description	Code List
ICD-10	Caries Diagnosis	K02.3, K02.5, K02.3, K02.5, K02.51, K02.52, K02.53, K02.6, K02.61, K02.62, K02.63, K02.7, K02.9
CDT	Preventive Dental Services	D0120-D0191, D0414-D0999, D0210-D0395, D1110-D1999
CDT	Restorative Dental Services	D2000-D2999
CDT	Endodontics	D3000-D3999
CDT	Periodontics	D4000-D4999
CDT	Oral and Maxillofacial Surgery	D7000-D7999
CDT	Anesthesia	D9210-D9248

Appendix Table 2. Rural vs. Urban Demographics of US Medicaid-Enrolled Children Ages 2-5 in 2021-2022

	<u>Total</u>	<u>Metropolitan</u> RUCA 1-3	<u>Micropolitan</u> RUCA 4-6	<u>Rural</u> RUCA 7-10	<u>Chi-square</u> <u>p-value</u>
Total, N (Row %)	9,125,333 (100)	7,419,622 (81.31)	906,045 (9.93)	799,666 (8.76)	
	N (Column %)	N (Column %)	N (Column %)	N (Column %)	
Age in Years					<0.0001
2	1,871,849 (20.51)	1,519,197 (20.48)	188,623 (20.82)	164,029 (20.51)	
3	1,899,835 (20.82)	1,543,451 (20.8)	190,032 (20.97)	166,352 (20.80)	
4	1,795,803 (19.68)	1,461,210 (19.69)	177,089 (19.55)	157,504 (19.70)	
5	3,557,846 (38.99)	2,895,764 (39.03)	350,301 (38.66)	311,781 (38.99)	
Sex					0.0004
Male	4,459,552 (48.87)	3,627,995 (48.90)	442,248 (48.81)	389,309 (48.68)	
Female	4,665,781 (51.13)	3,791,627 (51.10)	463,797 (51.19)	410,357 (51.32)	
Race and Ethnicity					<0.0001
White, non-Hispanic	2,598,450 (28.48)	1,831,301 (24.68)	383,621 (42.34)	383,528 (47.96)	
Black, non-Hispanic	1,634,230 (17.91)	1,462,919 (19.72)	98,965 (10.92)	72,346 (9.05)	
Hispanic	2,258,464 (24.75)	1,954,662 (26.34)	186,901 (20.63)	116,901 (14.62)	
Other, non-Hispanic	605,289 (6.63)	475,487 (6.41)	54,963 (6.07)	74,839 (9.36)	
Missing	2,028,900 (22.23)	1,695,253 (22.85)	181,595 (20.04)	152,052 (19.01)	
Income					<0.0001
0-133% FPL	5,110,059 (56.00)	4,044,290 (54.51)	561,855 (62.01)	503,914 (63.02)	
134-199% FPL	656,096 (7.19)	540,483 (7.28)	63,832 (7.05)	51,781 (6.48)	
200% FPL and over	201,842 (2.21)	151,000 (2.03)	28,528 (3.14)	22,314 (2.79)	
Missing	3,157,336 (34.6)	2,683,849 (36.17)	251,830 (27.79)	221,657 (27.72)	
Census Region					<0.0001

Northeast	1,346,936 (14.76)	1,196,999 (16.13)	79,779 (8.81)	70,158 (8.77)	
Midwest	1,778,934 (19.49)	1,334,382 (17.98)	222,904 (24.6)	221,648 (27.72)	
South	4,008,013 (43.92)	3,192,094 (43.02)	429,537 (47.41)	386,382 (48.32)	
West	1,991,450 (21.82)	1,696,147 (22.86)	173,825 (19.19)	121,478 (15.19)	

Appendix Table 3. Frequency of Preventive Dental Services, Restorative or Surgical Dental Services, and Dental Caries among US Medicaid-Enrolled Children Ages 2-5 in 2021 and 2022

Year	2021			2022		
	<u>Metropolitan</u> RUCA 1-3	<u>Micropolitan</u> RUCA 4-6	<u>Rural</u> RUCA 7-10	<u>Metropolitan</u> RUCA 1-3	<u>Micropolitan</u> RUCA 4-6	<u>Rural</u> RUCA 7-10
Any Preventive Dental Services						
Yes	45.44%	46.97%	47.22%	62.19%	63.76%	64.22%
No	54.56%	53.03%	52.78%	37.81%	36.24%	35.78%
Prophylaxis/Cleanings Per Year						
2	13.19%	13.57%	14.06%	20.37%	20.98%	21.24%
1	22.11%	22.93%	23.35%	30.80%	31.64%	31.85%
0	64.70%	63.49%	62.59%	48.83%	47.38%	46.91%
Any Restorative or Surgical Dental Services						
Yes	10.42%	10.88%	12.60%	16.64%	17.28%	19.49%
No	89.58%	89.12%	87.40%	83.36%	82.72%	80.51%
Cavity Fillings or Crowns						
Yes	8.47%	8.82%	10.22%	13.37%	13.88%	15.70%
Other Restorative or Surgical Treatment	1.95%	2.06%	2.38%	3.27%	3.4%	3.79%
No Restorative Treatment	89.58%	89.12%	87.40%	83.36%	82.72%	80.51%
Any Caries Diagnosed						
Yes	3.55%	4.10%	4.40%	3.40%	4.94%	5.16%
No	96.45%	95.90%	95.60%	96.60%	95.06%	94.84%
Number of Caries Diagnosed in Year, Among those with Any Caries Diagnosis						
1	39.50%	36.65%	35.04%	40.11%	36.94%	36.39%
2	28.11%	29.75%	28.52%	27.67%	29.35%	28.19%
3 or more	32.39%	33.60%	36.44%	32.22%	33.70%	35.43%



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