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Comparative Analysis of Dental Caries in Low-Income Children Under 12: Evidence from the United States, South Korea, and Japan

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ABSTRACT

We compared recent evidence on dental caries among low-income children <12 years in the United States, South Korea, and Japan. Low-income children show substantially higher caries prevalence and untreated decay in all three countries, driven by access, socioeconomic, and behavioral factors. Policy actions to expand preventive care and reduce access barriers are needed.

Keywords: Dental caries; Low-income children; Oral health disparities; Access to care; Preventive dentistry

INTRODUCTION

Dental caries remains the most common chronic disease of childhood worldwide and disproportionately impacts socioeconomically disadvantaged children. Low household income is consistently associated with higher caries prevalence, greater numbers of decayed and untreated teeth, and reduced access to preventive and restorative services. In the United States, national surveillance and analyses show markedly higher untreated decay among children in high-poverty groups and among racial/ethnic minority children. The CDC's 2024 surveillance summarized that children in high-poverty groups had substantially higher prevalence of untreated tooth decay and caries experience than children in low-poverty groups [1-8]. Pandemic disruptions also exacerbated inequalities in access to preventive visits and may have worsened caries trends among vulnerable children [3].

South Korea's national oral health surveys (2021–2022) report high caries experience in primary dentition among young children (e.g., ~66% experience in 5-year-olds) and persistent socioeconomic gradients in caries and unmet need; recent Korean trend analyses indicate declines in overall caries but continuing inequalities by household income [4,2,21]. Studies analyzing Korean national survey data show that low-income children have lower dental service utilization and higher untreated caries rates compared to peers [21,7].

Japan operates a universal health insurance system which covers basic dental care, yet studies still document disparities: children from households receiving public assistance or with lower socioeconomic status have lower

utilization and higher untreated caries prevalence; regional variation also persists [13,22]. National school-based surveillance shows overall declines in caries prevalence in recent years, but inequality by household socioeconomic status remains an issue [2,5].

Comparative analyses across these three high-income East Asian/North American settings reveal shared drivers: limited access to preventive care, caregiver socioeconomic and educational factors, diet (sugar intake), and oral-health behaviors; country-specific moderators include insurance design, school-based programs, and targeted public assistance policies [11,24]. The international literature highlights that even where coverage exists (e.g., Japan), social determinants and care-seeking barriers maintain disparities among low-income children [10,13].

This review synthesizes recent empirical evidence (national surveys, cohort studies, cross-sectional analyses and reviews from 2020–2025) on caries prevalence and untreated decay among low-income children under age 12 in the United States, South Korea, and Japan, identifies common and country-specific determinants, and outlines policy and program recommendations to reduce inequities and caries burden. Key load-bearing empirical observations below cite national surveillance and recent peer-reviewed analyses.

RESEARCH METHODS

We conducted a rapid evidence synthesis of literature published since 2020 (extended to 2025 where available) addressing dental caries prevalence and untreated caries among children under 12 from low-income households in the United States, South Korea, and Japan. Databases and sources searched included: PubMed/PMC, national oral health surveillance reports (CDC), Korea national oral health survey reports, Japanese national surveillance and peer-reviewed studies, and recent systematic reviews and observational studies. Search terms combined keywords and MeSH where available: (“dental caries” OR “tooth decay”) AND (“children” OR “pediatric” OR “under 12”) AND (“low income” OR “poverty” OR “public assistance” OR “socioeconomic”) AND (United States OR Korea OR Japan). Gray literature (CDC surveillance reports, ADA policy briefs, national survey reports) was included to capture recent prevalence estimates and socioeconomic stratification [1,8,17].

Selection criteria: studies or reports with (1) population aged <12 years or stratified results for this age group; (2) stratified outcomes by socioeconomic status, poverty, insurance or public assistance; (3) outcomes reporting caries prevalence, decayed-filled-missing teeth (dmft/DMFT), or untreated decay; (4) published 2020–2025 (including national 2021–2022 survey releases). Excluded were studies without socioeconomic stratification, adult-only studies, and non-empirical commentaries.

Data extraction captured country, data source, year(s), age groups, poverty or income definition, caries prevalence (any caries / untreated decay), dmft/DMFT where reported, dental service utilization, and key covariates (race/ethnicity, insurance, caregiver education, sugar intake). We summarized trends and computed cross-country comparisons descriptively, acknowledging heterogeneity in measurement and survey age bands. Major findings were triangulated with recent systematic reviews on childhood caries burdens and the impact of COVID-19 disruptions on pediatric dental care [11,3].

RESULTS

United States.National data and recent studies consistently show a strong income-gradient in caries. The CDC 2024 surveillance reported that children in high-poverty groups had far higher prevalence of untreated decay and caries experience than those in low-poverty groups; for ages 6-9, high-poverty groups approached ~60% caries experience compared with ~40% in low-poverty groups, and untreated decay rates were similarly elevated [1,8]. Recent peer-reviewed syntheses highlighted that low-income, non-Hispanic Black and Hispanic children experienced higher untreated caries and lower preventive utilization; pandemic-era studies documented worsening access and increased untreated disease in some populations [3,20]. A 2024 ADHA review summarized pooled prevalence estimates across studies in low-income samples showing wide ranges (approx. 30–70% prevalence depending on setting) and large unmet need [20].

South Korea.Korea's 2021-2022 National Children's Oral Health Survey reported high caries experience among young children (e.g., ~66% in 5-year-olds) and notable untreated decay in some age bands; trend analyses show overall declines but persistent gaps by household income [4,21]. Recent Korean studies using national datasets identified that children from lower income quintiles have reduced preventive dental visits and higher dmft scores, with oral health behaviors and caregiver factors mediating part of this association [7,9]. Regional disparities (urban vs rural, metropolitan differences) were reported [15].

Japan.National surveillance and cohort analyses show declines in overall caries prevalence among schoolchildren, but socioeconomic disparities persist. Studies analyzing children on public assistance found lower utilization and higher untreated caries compared with non-assistance peers [10,13]. Japanese analyses also point to nutritional and access factors (family structure, municipality-level service availability) as drivers of disparities [22,5].

Cross-country patterns.Across all three countries low-income children have higher caries prevalence and higher rates of untreated decay. Magnitude varies by measurement and age group: the U.S. shows large absolute disparities driven by insurance gaps and structural inequities (and racial/ethnic disparities) [1,3]; Korea shows high overall primary-tooth caries experience but evidence of decline with persisting income gradients [4,21]; Japan shows lower recent prevalence overall but persistent gaps within public assistance cohorts [13,22]. Common predictors across countries included lower dental visit frequency, higher sugar consumption, caregiver education, and lack of targeted preventive programs.

DISCUSSION

This synthesis of recent evidence highlights that, despite differences in health systems and insurance models, low-income children under 12 experience disproportionately high caries burden in the United States, South Korea, and Japan. Mechanisms documented across studies include limited access to preventive services, lower dental service utilization, dietary risk (sugar), caregiver socioeconomic and educational constraints, and structural barriers such as clinic availability and out-of-pocket cost.

In the U.S., persistent disparities reflect a complex interplay of insurance coverage gaps (even with Medicaid/CHIP variability), social determinants, and race/ethnicity–linked inequities; pandemic disruptions further exacerbated unmet

need [1,3,17]. Policy implications include strengthening early childhood preventive platforms: expanded Medicaid/CHIP dental outreach, school-based sealant and fluoride programs, caregiver education, and targeted case-management for high-risk households.

South Korea's high primary-tooth caries experience among preschoolers suggests the need for earlier preventive interventions and caregiver outreach despite improvements; school-based oral health programs and universal coverage of basic dental care have helped, but utilization gaps and regional differences remain [4,21]. Policies to reduce cost barriers for preventive visits (targeting low-income families), integrate oral health with maternal/child health services, and promote sugar reduction could accelerate declines.

Japan's universal coverage reduces direct cost barriers for many services but disparities among public assistance recipients indicate non-financial barriers (accessibility, caregiver awareness, or administrative obstacles) and social determinants remain influential [13,22]. Strengthening municipal outreach, ensuring timely preventive services for children on public assistance, and school-based screening and referral mechanisms are promising.

Across countries, effective strategies documented in the literature include: (1) school- or community-based preventive programs (fluoride varnish, sealants); (2) early childhood oral health promotion integrated into overall child health visits; (3) targeted outreach to families on public assistance and high-risk groups; (4) sugar-reduction public health measures; and (5) monitoring and real-time surveillance to identify and target high-need locales [11,17,24]. Implementation must be tailored to system context: for example, U.S. policies may emphasize insurance and coverage expansion plus community dental health coordinator models; Korea may prioritize preschool and school outreach and caregiver education; Japan may strengthen municipal case-finding in public assistance programs.

Limitations: cross-study heterogeneity in age bands, poverty definitions, and caries measurement impede precise numeric cross-country comparisons. Many studies are cross-sectional; longitudinal tracking of cohorts is limited. Further research should harmonize core outcome sets, use comparable poverty definitions, and evaluate effectiveness of targeted interventions for low-income children.

CONCLUSION

Low-income children under 12 in the US, Korea, and Japan face higher caries prevalence and untreated decay. Policy focus on early preventive programs, targeted outreach, and access-reducing measures is urgently needed.

REFERENCES

1. CDC. Oral Health Surveillance Report: Selected Findings-disparities by poverty and race/ethnicity. 2024.
2. Kwon YJ, Choi SY, Lee Y, Lee JW. Secular trends in dental caries in Korean children and adolescents. 2025.
3. Scherrer C, Naavaal S, Lin M, Griffin SO. COVID-19 Pandemic Impact on US Childhood Caries and Potential Mitigation. J Dent Res . 2022;101(10):1147-1154.
4. Korea National Children's Oral Health Survey / analyses (2021–2022). PHWR.
5. Tabata E. Evaluation of the Dental Caries Status of New Pediatric Patients in Tertiary Dental Institutions in 2013, 2018, and 2023. Children. 2025;12(8):960.

6. Futun Alkhalifah, Denise C McKinney, Qi Zhang. Prevalence of Dental Caries and Utilization of Dental Services among WIC-participating Children: A scoping review. J Dent Hyg. 2024;98(5):34-44.
7. Shin HE et al. Dental Caries Status and Trends in 5-Year-Old Children. Korea. 2024.
8. CDC Health disparities in oral health (page summarizing untreated cavities by income).
9. Kim EJ. The Relationship Between Maternal Employment and Educational Status and Children's Oral Health: A Study Focusing on the Panel Study on Korean Children. Hygiene. 2025;5(3):31.
10. Nishioka D, Kawachi H, Ueno K, Aida J, Konda N. Sociodemographic determinants of dental care utilization among children receiving public assistance in Japan: a one-year observational study. 2025;5(108).
11. Liyun Zhai, Jiaxin Kong, Chaonan Zhao, Yang Xu, Xiaoxue Sang, Weiguang Zhu, et al. Global trends and challenges in childhood caries: 20-year bibliometric review. Transl Pediatr. 2025;14(1):139-152.
12. Frontiers in Public Health / Japan convenience stores and caries (Nawa et al. 2023). Frontiers
13. Yuki Nakamura, Yukiko Nogami, Yoko Iwase, Mio Hozawa, Tetsuya Sotome, Issei Saitoh, et al. Dental caries prevalence in children during temporary protective care according to type of abuse. BMC Public Health. 2024;24(1):1345.
14. ADA report: Improving dental care access for vulnerable populations. Ada. 2024.
15. Frontiers Oral Health systems mapping (2023/2024)-multilevel determinants of pediatric caries disparities. Frontiers.