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Evaluation of Dentists' Involvement in Children's Public Insurance Programs

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Abstract

Access to dental care for children covered by public insurance programs. Rural areas face particularly pronounced challenges due to dentist shortages and lower participation in public insurance programs. Previous studies have explored dentist participation in public insurance programs but have not adequately addressed differences between rural and urban areas, or among dental practice types.This study analyzed data from Dentists were categorized by location (rural, suburban, or urban), practice type (general, pediatric, or specialist), and public insurance participation . Data were matched and classified using rural-urban commuting area (RUCA) codes. Statistical analyses were conducted to compare participation rates and geographic disparities, with results visualized at city and county levels.Among the 225,300 dentists analyzed, urban areas had the highest concentration of dentists (84%) but the lowest public insurance participation rates . Rural areas had fewer dentists (5%) but exhibited higher participation rates . Pediatric dentists showed the highest public insurance participation, whereas general dentists and specialists had significantly lower rates. Variability in participation was observed at city and county levels, with disparities reaching up to 100% in certain counties.Significant disparities in dentist availability and participation , particularly in rural areas and among non-pediatric dentists. City -level policies, such as joint administration, expanded loan forgiveness programs, and school-based dental services, are essential to improve access. Tailored, localized interventions are necessary to address geographic and professional disparities and ensure equitable pediatric dental care access.

Keywords: *Children's Public Insurance Programs, Rural Areas, Dental Care.*

Introduction

The distribution of dentists shows significant variation, with the number of dentists per 100,000 individuals ranging from 41.8 in some areas to 82.7 in others, as of 2019 (1, 2). Reports from the Health Policy Institute of the Dental Association (HPI-ADA) have examined dentist participation in public insurance programs (1, 3) and the geographical accessibility of dental services (4). However, these analyses have limitations, as they do not distinguish between rural and urban dental practices, account for the type of dental practice (general, pediatric, or specialized), or differentiate among public insurance programs.

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Understanding the distribution of dental professionals in rural versus urban areas is crucial for implementing targeted strategies to improve dental care access in underserved rural regions, which often face significant healthcare challenges (5). Since dental practitioners are needed for both preventative and specialized treatments, assessing the availability of various dental specializations is vital, especially in the context of their participation in public insurance programs.

Public insurance for children primarily includes VIP program and C PROGRAM, which provide coverage for children from low-income households, children with disabilities, and those in foster care. VIP program generally serves a larger population than C PROGRAM and has more extensive minimum coverage requirements (6). Cities have flexibility in administering these programs, which can be managed separately, through VIP program expansion C PROGRAM, or as a hybrid of the two approaches (7). Variations in the administration of VIP program and C PROGRAM, including differences in fee schedules and policies, may influence the accessibility of dental care for children insured under these programs.

This research builds on previous studies by examining the distribution of dentists across the country, categorized by dental practice type, rural or urban location, and participation in public insurance programs. The analysis includes data from 48 cities and the District of Columbia, excluding certain cities where licensure data were unavailable. A web-based data portal accompanies this study, offering outcome data on the availability of dental care for children by city, further detailed in individual reports and mapped by rurality, urbanicity, and dental specialization.

Methods

The study focused on the dentist population categorized by city, type of practice (taxonomy), rural or urban practice location, and participation in public insurance programs.

The data, collected from city -level Boards of Dentistry, included information on all licensed dentists, regardless of their work setting (private practice or safety-net facilities). Only actively licensed dentists were included in the study.

This data set included dentists' names, addresses, and taxonomies (general, pediatric, or specialist), which were verified against the BOD data for taxonomy classification.

Dentist characteristics included (1) taxonomy (general, pediatric, or specialist), (2) practice location classification as rural, suburban, or urban, and (3) participation in public insurance programs (VIP program, C PROGRAM, or both). The rurality or urbanicity classification was determined using the rural-urban commuting area (RUCA) system (10),

The study measured (1) the total number and percentage of dentists, (2) the number and percentage of dentists participating in VIP program, C PROGRAM, or both programs, and (3) the number and percentage of dentists engaged in any public insurance program (VIP program or C PROGRAM). Data were aggregated at practice locations, stratified by rurality/urbanicity and taxonomy, and summarized at the city level.

Data Analysis

The analysis was conducted using Python, version 3.7.4, with packages including pandas, numpy, matplotlib, altair, and geopandas. R, version 4.0.2, was also utilized for data analysis and visualization.

Among the 204,279 active dentists included in the study, the dentist-to-population ratio (per 100,000 individuals) showed significant variation across regions. For example, ratios ranged from as low as 41 to as high as 111, depending on the location. Overall, the majority of dentists operated in urban areas (median 84%, interquartile range [IQR] 23%), followed by suburban areas (median 11%, IQR 11%), and finally rural areas (median 5%, IQR 10%). Most practitioners were general dentists (median 84%, IQR 4%), with specialists comprising 13% (median, IQR 3%) and pediatric dentists accounting for 3% (median, IQR 1%).

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In some cities, general dentists represented up to 90% of the dental workforce, while pediatric dentists constituted as little as 1% in others.

Results

In comparing VIP program and/or C PROGRAM participation rates among dentists as indicated in this study with public insurance participation data Dental Association (ADA) (1, 3). In 20 regions, VIP program and C PROGRAM participation rates were the same, reflecting that dentists database were active in both programs. In contrast, eight regions showed participation in either VIP program or C PROGRAM exclusively. Although federal policies require both VIP program and C PROGRAM to offer dental benefits, we assumed parity in participation rates despite administrative differences. For 21 regions, VIP program and C PROGRAM participation rates diverged significantly, with differences reaching up to 70%. Certain areas revealed large discrepancies, such as VIP program participation being substantially lower than C PROGRAM in some regions (e.g., 5% vs 75% and 2% vs 51%), whereas others demonstrated the reverse pattern (e.g., 42% vs 6%). Nine areas exhibited higher C PROGRAM participation rates, while 12 areas had higher VIP program participation rates.

VIP program and C PROGRAM participation rates by geographic classification within each region. Dentists practicing in rural areas exhibited the highest participation rates, whereas urban dentists had the lowest rates. The median VIP program participation rates were 39% (IQR 29%) for rural dentists, 32% (IQR 30%) for suburban dentists, and 26% (IQR 16%) for urban dentists. C PROGRAM participation rates followed a similar trend: 40% (IQR 30%) for rural dentists, 36% (IQR 34%) for suburban dentists, and 29% (IQR 22%) for urban dentists. For example, VIP program and C PROGRAM participation among rural dentists peaked at 82% in one area, whereas urban dentists reached a maximum of 68% elsewhere. Some regions demonstrated minimal C PROGRAM and VIP program participation across all classifications, with one notable region having participation rates as low as 6% for urban dentists and 3% for rural dentists.

Pediatric dentists had the highest median participation rates in VIP program (57%, IQR 39%) and C PROGRAM (57%, IQR 34%), followed by general dentists (VIP program, 28%, IQR 20%; C PROGRAM, 29%, IQR 28%) and specialists (VIP program, 25%, IQR 17%; C PROGRAM, 24%, IQR 26%). Pediatric dentists in one area reached as high as 94% VIP program participation, while general dentists reached 65% in another. Some regions revealed significant differences in VIP program vs C PROGRAM participation rates by taxonomy, such as variations of up to 92% for pediatric dentists and 73% for general dentists. Conversely, the lowest rates were observed for general dentists and specialists in specific regions, with participation rates as low as 6% and 7%, respectively.

Discussion

This analysis investigated the availability of dentists providing pediatric care and their participation in public insurance programs such as VIP program and C PROGRAM. The study examined variations in dentist availability and participation rates based on geographic classifications (urban vs. rural) and professional taxonomy. The findings highlight significant disparities and call for more in-depth exploration of dentist accessibility for children.

The availability of dentists in rural areas exhibited substantial variability, with some regions having very few or no rural dentists and others showing a more balanced distribution across urban, suburban, and rural settings. In general, the proportion of dentists practicing in rural regions was significantly lower than the percentage of rural communities in those areas (11). This disparity suggests an insufficient supply of dental services for children in rural locations. Policies like loan repayment initiatives (12,13) or mobile school-based care models may help mitigate these shortages (14,15,16).

One focus of the study was to assess dentist participation in VIP program and C PROGRAM. The cities exhibited diverse management practices for these programs, with some managing them jointly and others

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separately. Variations in program administration included single-administrator models with separate enrollment, VIP program expansion covering both children and adults, or standalone C PROGRAM programs (7,17,18). These administrative differences contributed to disparities in dentist participation rates, as complex processes often discourage participation (19). Aligning the administration of VIP program and C PROGRAM under unified systems could improve enrollment and participation rates among dentists.

The findings revealed differences between the VIP program and C PROGRAM participation rates reported in this study and those provided by the Dental Association in previous analyses (1,3). The variations may result from differences in data sources and methodologies. For example, this study utilized the IKN dataset, which focuses on dentists participating in public insurance, while the HPI-ADA's earlier analyses relied on VIP program Statistical Information System data (3). Differences in reported participation rates across cities underscore the need for consistent data collection and reporting practices.

Although rural areas had fewer practicing dentists, those who did practice in rural settings demonstrated higher participation rates in VIP program and C PROGRAM compared to suburban and urban dentists. This trend highlights inconsistencies in dentist availability across regions and programs, emphasizing the need for targeted policy measures to enhance access.

Pediatric dentists had nearly double the participation rates in VIP program and C PROGRAM compared to general and specialist dentists, despite representing a small proportion of the dental workforce in most regions. This discrepancy suggests the importance of designing policies to support pediatric dentists, such as loan forgiveness programs tailored specifically to this group. Pediatric dentists are often crucial in treating children with complex conditions, including special needs or behavioral challenges, which reinforces the need for their availability.

The study also analyzed dentist availability at the county level, revealing substantial disparities even within cities. Some counties lacked participating dentists altogether, while others reported full participation. These variations likely reflect differences in social, cultural, and regulatory factors influencing dentist distribution. Addressing these disparities requires localized interventions tailored to the specific needs of each community.

Conclusions

This study revealed significant disparities in dentist availability for pediatric care, particularly among children insured through VIP program or C PROGRAM and those living in rural areas. Variability across cities and within communities highlights the need for tailored city -level policies. Measures such as joint administration of VIP program and C PROGRAM, expansion of loan forgiveness programs, and funding for school-based dental services could help address these disparities (21,22,23,24).

Localized approaches are essential for improving access, especially in areas with significant gaps in dentist participation. Current methods for identifying dental shortage areas could benefit from incorporating more rigorous criteria to accurately target interventions. Despite the mandate for dental care benefits for children under VIP program and C PROGRAM (7), limited dentist availability remains a barrier, mirroring findings from previous research (22). This study underscores the persistent challenge of ensuring equitable access to pediatric dental care over a decade later.

References

Aguilera-Hermida, A. P. (2020). College students' use and acceptance of emergency online learning due to COVID-19. *International Journal of Educational Research Open, 1*, 100011. https://doi.org/10.1016/J.IJEDRO.2020.100011

Azhar, N., & Rani, N. C. A. (2020). Student readiness towards e-learning adoption in higher education: A conceptual model based on extended technology acceptance model. *Journal on Technical and Vocational Education, 5*(2), 61-74. https://doi.org/10.5539/hes.v6n3p72

Baber, H. (2021). Modelling the acceptance of e-learning during the pandemic of COVID-19-A study of South Korea. *The International Journal of Management Education, 19*, 100503. https://doi.org/10.1016/j.ijme.2021.100503

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Bojović, Ž., Bojović, P. D., Vujošević, D., & Šuh, J. (2020). Education in times of crisis: Rapid transition to distance learning. *Computer Applications in Engineering Education*, *28*(6), 1467-1489. https://doi.org/10.1002/cae.22318

Careaga-Butter, M., Badilla-Quintana, M. G., & Fuentes-Henríquez, C. (2020). Critical and prospective analysis of online education in pandemic and post-pandemic contexts: Digital tools and resources to support teaching in synchronous and asynchronous learning modalities. *Aloma*, *38*(2), 23–32. https://doi.org/10.51698/ALOMA.2020.38.2.23-32

CEPAL-UNESCO. (2020). Education during the COVID-19 pandemic. *Comisión Económica Para América Latina y El Caribe, Santiago - Oficina Regional de Educación Para América Latina y El Caribe de La Organización de Las Naciones Unidas Para La Educación La Ciencia y La Cultura*, *11*, 11–18.

Chapman, D. D. (2011). Contingent and tenured/tenure-track faculty: Motivations and incentives to teach distance. *Online Journal of Distance Learning Administration*, *14*(3), 1-12.

Chetty, R., Friedman, J. N., Hendren, N., Jones, M. R., Porter, S. R., Hall, R., & Hendren Harvard, N. (2018). *The opportunity atlas: Mapping the childhood roots of social mobility*. Retrieved from www.opportunityatlas.orgtract-leveldataisavailableathttps://opportunityinsights.org/data/

Davis, F. D. (1985). A technology acceptance model for empirically testing new end-user information systems: Theory and results. Doctoral dissertation, Massachusetts Institute of Technology.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly: Management Information Systems*, *13*(3), 319–339. https://doi.org/10.2307/249008

Davis, F. D., Al-Suqri, M., & Al-Aufi, A. (1989). Technology acceptance model: TAM. *Information Seeking Behavior and Technology Adoption*, *205–219*.

Edwards, A. L. (1946). A critique of "neutral" items in attitude scales constructed by the method of equal appearing intervals. *Psychological Review*, *53*(3), 159–169. https://doi.org/10.1037/H0054184

Farooq, S., Ahmad, Z., Hassan, N., & Sarfraz Khan, M. (2021). Technology acceptance model for e-learning during covid-19: Empirical insight from pakistan: A technology acceptance model for e-learning during COVID-19: Empirical Insight from Pakistan. *Ilkogretim Online-Elementary Education Online*, *20*(4), 975–984. https://doi.org/10.17051/ilkonline.2021.04.105

Fernández Aráuz, A. (2015). Application of confirmatory factor analysis to a measurement model of academic performance in reading. *Revista de Ciencias Económicas*, *33*(2), 39. https://doi.org/10.15517/rce.v33i2.22216

Green, T., Alejandro, J., Brown, A. H., & Green, T. (2023). International review of research in open and distributed learning the retention of experienced faculty in online distance education program: Understanding factors that impact their involvement the retention of experienced faculty in online distance education programs: understanding factors that impact their involvement.

Gutiérrez-Doña, B. (2008). Structural linear models: Basic concepts, Applications and programming with LISREL. *San José, CR.: Instituto de Investigaciones Psicológicas, Universidad de Costa Rica.*

Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020). The difference between emergency remote teaching and e-learning. *Educause - Frontiers in Education*, *7*, 1-3. https://doi.org/10.3389/feduc.2022.921332

Huang, F., Sánchez-Prieto, J. C., & Teo, T. (2020). The influence of university students' learning beliefs on their intentions to use mobile technologies in learning: A study in China and Spain. In (pp. 3547–3565): Education Tech Research Dev. https://doi.org/https://doi.org/10.1007/s11423-020-09806-0.

Ibrahim, N. K., Al Raddadi, R., AlDarmasi, M., Al Ghamdi, A., Gaddoury, M., AlBar, H. M., & Ramadan, I. K. (2021). Medical students' acceptance and perceptions of e-learning during the Covid-19 closure time in King Abdulaziz University, Jeddah. *Journal of Infection and Public Health*, *14*(1), 17–23. https://doi.org/10.1016/J.JIPH.2020.11.007

Jatmikowati, T. E., Rachman, A. U., & Adwitiya, A. B. (2021). Technology acceptance model in using e-learning on early childhood teacher education program's student during pandemic. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, *5*(2), 1501–1511. https://doi.org/10.31004/obsesi.v5i2.801

Kumar, B. S., & Kumara, S. S. (2018). The digital divide among the rural and urban students: An exploration. *South Asian Journal of Participative Development*, *18*(2), 160-167.

Lavery, M. P., Abadi, M. M., Bauer, R., Brambilla, G., Cheng, L., Cox, M. A., . . . Kelly, A. E. (2018). Tackling Africa's digital divide. *Nature Photonics*, *12*(5), 249-252.

Lazim, C., Ismail, N. D. B., & Tazilah, M. (2021). Application of technology acceptance model (TAM) towards online learning during covid-19 pandemic: Accounting students perspective. *International Journal of Business, Economics and Law*, *24*(1), 13-20.

Ligorio, M. B., Cacciamani, S., & Cesareni, D. (2020). The acceptance of distance learning: Research in the university context. In P.P. Limone, G.A. Toto, N. Sansone (ed.) Distance university teaching. Between emergencies and the future. In (pp. 91–102). Quaderni di Qwerty, Bari: Progedit.

Mardia, K. V. (1970). Measures of multivariate skewness and kurtosis with applications. *Biometrika*, *57*(3), 519–530. https://doi.org/10.1093/biomet/57.3.519

Messina, D., & García, L. (2020). Diagnostic study on teachers in Latin America and the Caribbean. *Documento de Trabajo.*

Mukminin, A., Muhaimin, M., Diat Prasojo, L., Khaeruddin, K., Habibi, A., Marzulina, L., & Harto, K. (2022). Analyzing social media use in Tefl via the technology acceptance model in Indonesian higher education during the COVID-19 pandemic. *Teaching English with Technology*, *22*(1), 3-22. https://doi.org/10.15659/ppad.15.2.997751

Pal, D., & Vanijja, V. (2020). Perceived usability evaluation of microsoft teams as an online learning platform during COVID-19 using system usability scale and technology acceptance model in India. *Children and Youth Services Review*, *119*, 105535. https://doi.org/10.1016/j.childyouth.2020.105535

Pekrun, R., Goetz, T., Frenzel, A. C., Barchfeld, P., & Perry, R. P. (2011). Measuring emotions in students' learning and performance: The achievement emotions questionnaire (AEQ). *Contemporary Educational Psychology*, *36*(1), 36-48.

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Saiyad, S., Virk, A., Mahajan, R., & Singh, T. (2020). Online teaching in medical training: Establishing good online teaching practices from cumulative experience. *International Journal Of Applied And Basic Medical Research*, *10*(3), 149-155. https://doi.org/10.4103/ijabmr.ijabmr_358_20

Sangthong, M. (2020). The effect of the likert point scale and sample size on the efficiency of parametric and nonparametric tests. *Thailand Statistician*, *18*(1), 55-64.

Sukendro, S., Habibi, A., Khaeruddin, K., Indrayana, B., Syahruddin, S., Makadada, F. A., & Hakim, H. (2020). Using an extended Technology Acceptance Model to understand students' use of e-learning during Covid-19: Indonesian sport science education context. *Heliyon*, *6*(11), e05410. https://doi.org/10.1016/J.HELIYON.2020.E05410

Teo, T. (2008). Pre-service teachers' attitudes towards computer use: A Singapore survey. *Australasian Journal of Educational Technology*, *24*(4), 413–424. https://doi.org/10.14742/ajet.1201

Teo, T. (2010a). The development, validation, and analysis of measurement invariance of the technology acceptance measure for preservice teachers (tampst). *Educational and Psychological Measurement* *70*(6), 990–1006. https://doi.org/10.1177/0013164410378087

Teo, T. (2010b). Validation of the technology acceptance measure for pre-service teachers (TAMPST) on a Malaysian sample: A cross-cultural study. *Multicultural Education & Technology Journal*, *4*(3), 163-172. https://doi.org/10.1108/17504971011075165

Teo, T. (2014). Unpacking teachers' acceptance of technology: Tests of measurement invariance and latent mean differences. *Computers and Education*, *75*, 127–135. https://doi.org/10.1016/j.compedu.2014.01.014

Teo, T., Lee, C. B., & Chai, C. S. (2007). Understanding pre-service teachers' computer attitudes: Applying and extending the technology acceptance model. *Journal of Computer Assisted Learning*, *24*(2), 128-143. https://doi.org/10.1111/j.1365-2729.2007.00247.x

Vaca-Cardenas, M. E., Meza, J., Estrada, A., & Vaca-Cardenas, L. A. (2020b). *Connectivism as a driver to improve citizen learning in cognitive cities: A literature review*. Paper presented at the The IAFOR International Conference on Education – Hawaii 2020 Official Conference Proceedings. https://doi.org/10.22492/issn.2189-1036.2020.1.

Vaca-Cárdenas, M. E., Ordonez-Avila, E. R., Vaca-Cárdenas, L. A., & Vaca-Cárdenas, A. N. (2024). Students' acceptance toward asynchronous virtual education during COVID-19 pandemic. *Kasetsart Journal of Social Sciences*, *45*(2), 483–492.

Vaca-Cárdenas, M. E., Ordoñez Ávila, E. R., Vaca-Cárdenas, L. A., Vargas Estrada, A., & Vaca-Cárdenas, A. N. (2020a). Connectivism as a potential factor to advertise housing let or sale a multiple case study applied in ecuadorian cities. *Information Technology, Education and Society*, *17*(2), 5–21. https://doi.org/10.7459/ites/17.2.02

World Health Organization. (2020). *WHO coronavirus (COVID-19) dashboard with vaccination data*. Retrieved from https://covid19.who.int/

Yu, S., Luo, L., Kalogiannakis, M., Liu, Q., Hong, X., & Zhang, M. (2021). Preschool teachers' technology acceptance during the covid-19: An adapted technology acceptance model. *Frontiers in Psychology*, *12*, 691492. https://doi.org/10.3389/fpsyg.2021.691492