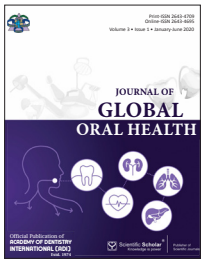
www.jglobaloralhealth.org

Journal of Global Oral Health



Research Article

Socioeconomic health and the scope of dental practice

Samay Rajan Verma[1]

[1]Certified Pharmacy Technician, Elmhurst University, Elmhurst, Illinois, United States.

***Corresponding author:**
Samay Rajan Verma,
Elmhurst University, Elmhurst, Illinois, United States.

samayverma20@gmail.com

Received: 19 June 2023
Accepted: 24 August 2023
EPub Ahead of Print: 29 November 2023
Published: 27 December 2023

DOI
10.25259/JGOH_27_2023

Quick Response Code:

ABSTRACT

Objectives: This study was an increase and decrease of the dental scope of practice during times of peace, relating to the poverty rate, gross domestic product (GDP) growth, and during times of public health emergency (SARS-COV-2 [COVID-19]). Dominant prior research suggests that a correlation is seen between the expansion of the dental scope of practice relating to natural disasters and public health emergencies. **Materials and Methods:** No evident prior data were found relating the scope of practice in relation to poverty rate and GDP growth. Analytical methods used include the composition of data with regard to biases or outliers present with statistical errors. **Results:** Major findings of the study suggest that dental scope of practice is increased as the poverty rate climbs higher in the United States. Findings also suggest the prime expansion of dentistry in states that have experienced substantial GDP growth in the past 5 years. Data also show that states with a larger urbanization index have better overall oral health. **Conclusion:** The agreement between the research shows and suggests that the practice of dentistry is expanded at times when Dentists are needed for their expertise and skills.

Keywords: Dentistry, Poverty, Urbanization, COVID-19, Scope of practice

INTRODUCTION

Data were compiled from multiple sources to determine whether the socioeconomic health of U.S. states affected their policies on the practice of dentistry in coexistence with medical doctors who have been granted the highest level of authority in medicine and prescriptive power. Several data have been compiled about the expansion of dentistry during times of natural disaster. An example of this includes the Illinois Healthcare Professional Emergency Volunteer Program, which has Dental Emergency Responders (DERs) who are deployed by the state.[1] Another example is the State of Nevada. In Nevada, dentists can do triage, immunizations, general clinical care, COVID-19 testing, general emergencies, local anesthesia, airway maintenance, surgery drug dispensing, and general symptom/syndrome surveillance.[2] However, now, it is necessary to study this on a national level, since dental regulation varies by state. There are many confounding factors such as healthcare worker shortages, public health emergencies, and abundance of dentists per area that come into play when dental practice acts are designed. A bill has also been introduced in the United States Congress to expand the role of dentists in emergency response situations on the federal level (DER Act of 2011, H.R. 112–24, 112th Cong. (2011).).[3]

To further understand the aforementioned confounding factors that play a role in the expansion or restriction of dental practice, it is important to study how and to what extent these factors play a role in the authority of dentists beyond their field. The data presents research only in mass epidemics such as SARS-COV-2 (COVID-19), but not times of natural disaster or peace.[4,5]

MATERIALS AND METHODS

Sources were compiled to assess the economic effects on the practice scope of dentistry. In total, two factors (Practice of Teledentistry, and Dental Hygienists with Direct Access) were used to address an expansion or restriction of dental practice. To compile a feasible and navigable data set, data were only compiled for the top and bottom-most 11 states based on their poverty rate. Further, data were compiled for the ratio of rural/urban land in a state. Data for the urban/rural settings in the United States were also compared with specialized data about urban-rural differences in dental care. The top and bottom-most ten states were used for these data sets. This comparison will help to see whether a dental health disparity is apparent in the urban/rural setting.[6] Any skewed data below or above the lower first quartile and higher third quartile was removed due to outliers caused by natural disasters in the COVID-19 emergency. In lieu of the removal, standard statistical tests were performed to keep data unbiased.[7,8]

RESULTS

Figure 1 shows the poverty rate in percent form from March of 2020 in accordance with the state that it represents. Figure 2[9,10] (in accordance with Figure 1) shows the number of factors met out of the two presented in the methods. The graph shows that there is a linear trend, with an R-squared value of 0.267. Figure 3[11] shows the GDP growth in the past 5 years from 2018 to 2022 versus the name of the U.S. state ($R^2 = 0.956$). Figure 4[9,10], which complements Figure 3 shows that a negative linear trend is present between the number of factors met and the GDP growth of 5 years, R-squared = 0.435.

Figure 5[12,13] shows the urbanization index in regard to the states with the best and worst overall dental health. The top and the bottom ten states are used for this graph. There is also a negative linear trend present in this set of data ($R^2 = 0.353$).

DISCUSSION

Morlang (1996)[14] first described the general idea of DERs and the expansion of dentistry. Although Morlang does not explicitly use the term DER, he suggests that civilians must have a Military Dental Officer Style training program. Morlang advocates that this training program will help dentists who provide excellent care at a time of an event where large amounts of injuries or casualties have occurred. This idea was again brought to life at the beginning of the COVID-19 pandemic,[5] and continued worldwide as the Public Health Emergency expired.[4] After disaster proclamations expired, both the general public and dentists were left confused about where their scope of practice lies.[15] For example, as dentists helped the NHS (National Health Service [England]) deliver babies during a pandemic, they questioned whether the expanded scope of practice would continue in the future.[16] The trend of DERs also holds true in other countries, for example, China. After the 2008 Wenchuan Earthquake, around 40% of people had suffered some form of a maxillofacial injury. The study also suggested that a specialized dental response team must be created to counter emergencies such as this one in the future.[17]

In the first part of the research [Figures 1 and 2], a positive linear trend was seen between meeting the two factors of

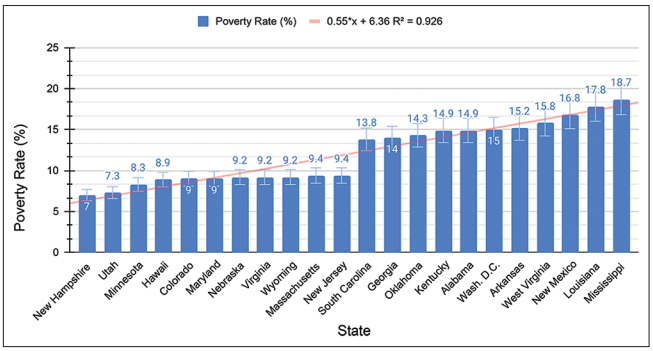


Figure 1: Poverty rate (%) versus state name. 10% error bars present. Top and bottom 11 states used for the data set (n = 22). Wash. D.C.: Washington D.C. n is a standard statistical term which refers to the size (number) of data (points).

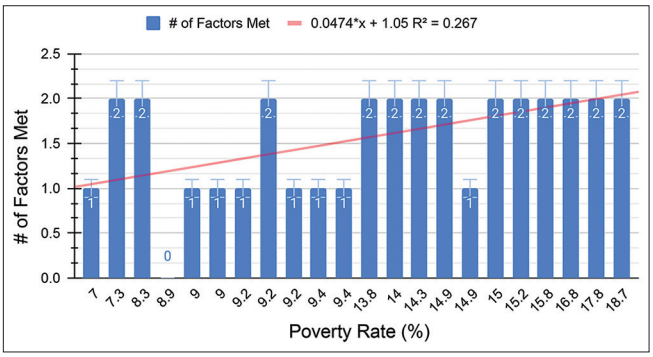


Figure 2: Number of factors met out of two provided versus poverty rate (%). 10% error bars present. The top and bottom ten states were used for data (n = 20). 1 and 2: The two methods are practice of Teledentistry and RDH's with direct access. n is a standard statistical term which refers to the size (number) of data (points). 0 means that no factors have been met.[9,10]

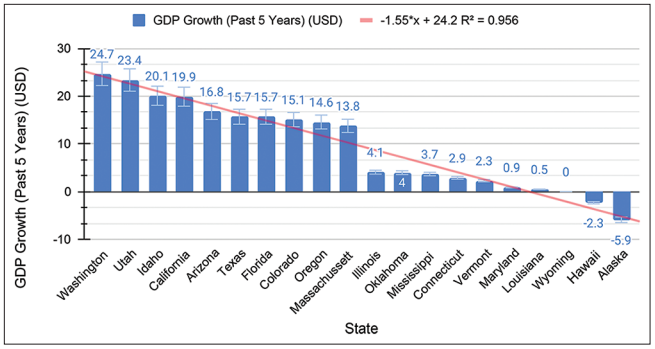


Figure 3: Relationship between gross domestic product growth over 2019–2022 and State. 10% error bars with top and bottom 10 states (n = 20). USD: US Dollar, GDP: Growth domestic product. n is a standard statistical term which refers to the size (number) of data (points). 0 means that no factors have been met.[11]

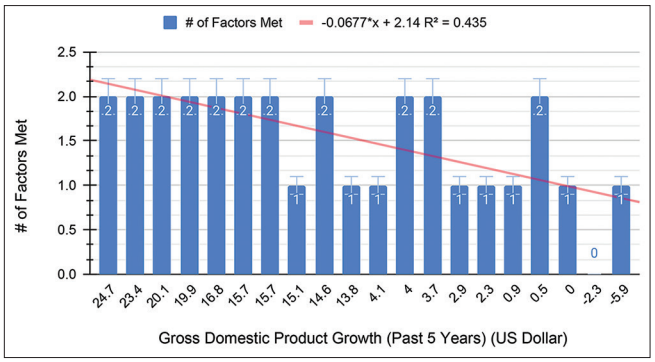


Figure 4: Number of factors out of two met versus gross domestic product growth from 2019 to 2022. 10% error bars, n = 20 (top/bottom 10 states). USD: US Dollar, GDP: Growth domestic product. 1 and 2: The two methods are practice of Teledentistry and RDH's with direct access. n is a standard statistical term which refers to the size (number) of data (points). 0 means that no factors have been met.[9-11]

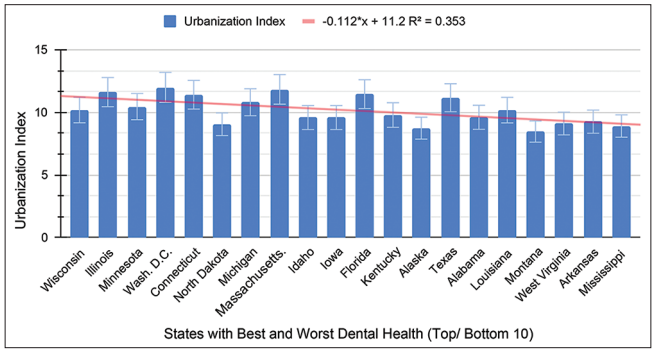


Figure 5: Relationship between urbanization index and states with best/worst dental health in order. 10% error bars, (n = 20). Wash. D.C.: Washington D.C. n is a standard statistical term which refers to the size (number) of data (points).[12,13]

expansion of practice and poverty rate. The positive linear trend suggests that dental practice was expanded as the poverty rates went up for the respective states. This can also suggest that with an R-squared value of 0.267, the findings were significant since only two factors were used to calculate this value. Figures 3 and 4 show a negative linear trend with another significant R-squared value. The negative linear trend suggests that states that have had the largest amount of GDP growth over the past 5 years overwhelmingly expanded the practice of dentistry. Figure 5 shows that states which have urbanized the post has better overall dental health. The data from Figure 5 also affirms the claim that as family income and urban urbanicity city increase, the percentage of preventative dental visits increases as well.[18]

CONCLUSION

The agreement between these figures and ideas strongly suggests that the practice of dentistry is expanded at times when dentists are needed for their skill and knowledge. The strong association can be seen during times of natural disaster, public health emergencies, increasing poverty rates, and a widening gap in healthcare in rural settings, etc. Overall, as socioeconomic health has declined, the scope of dental practice has expanded linearly.

Acknowledgments

I would like to thank my father, Dr. Rajan Verma, D.D.S., for sincere guidance and support in synthesizing the topic, Dr. Bridget O'Rourke, Elmhurst University English Department for making this study possible. I am also grateful to Dr. Patrick Mineo and Dr. Paul Arriola of the Elmhurst University Biology Department for providing vital education on the writing of a scientific journal paper.

Statement of limitations

This study has limitations. The limitation was present in the research portion of this study. Due to the limitation of time, this study only included the top/bottom 10/11 states to be assessed in the data. In the future, it would be feasible to include as many as all 50 states and the provinces of Canada.

Declaration of patient consent

Patient's consent not required as there are no patients in this study.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The author(s) confirms that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

REFERENCES

1. Colvard MD, Lampiris LN, Cordell GA, James J, Guay A, Lee M, *et al*. The dental emergency responder; n.d. Available from: https://jada.ada.org/article/S0002-8177(14)60713-3/fulltext [Last accessed on 2023 May 04].
2. Colvard MD, Vesper BJ, Kaste LM, Hirst JL, Peters DE, James J, *et al*. The evolving role of dental responders on interprofessional emergency response teams. Dent Clin North Am 2016;60:907-20.
3. United States Congress. Dental emergency responder act of 2011; 2011-2012. Available from: https://www.congress.gov/congressional-report/112th-congress/house-report/24 [Last accessed on 2023 Aug 24].
4. Thayer TN, Wahlert L, France K. Pandemic-driven changes in the scope of dental practice: Ethical implications. J Am Dent Assoc 2022;153:909-11.
5. Seneviratne CJ, Lau MW, Goh BT. The role of dentists in COVID-19 is beyond dentistry: Voluntary medical engagements and future preparedness. Front Med (Lausanne) 2020;7:566.
6. Luo H, Wu Q, Bell RA, Wright W, Quandt SA, Basu R, *et al*. Rural-urban differences in dental service utilization and dental service procedures received among US adults: Results from the 2016 medical expenditure panel survey. J Rural Health 2021;37:655-66.
7. Eliazar I. Investigating equality: The poverty and riches indices. Chaos Solitons Fractals 2016;92:30-42.
8. Feng C, Wang H, Lu N, Chen T, He H, Lu Y, *et al*. Log-transformation and its implications for data analysis. Shanghai Arch Psychiatry 2014;26:105-9.
9. Scope of practice. ADHA; 2022. Available from: https://www.adha.org/advocacy/scope-of-practice [Last accessed on 2023 Aug 24].
10. Scope of practice policy; 2016. Available from: https://scopeofpracticepolicy.org [Last accessed on 2023 Aug 24].
11. DePietro A. U.S. GDP by state and fastest growing states by GDP growth. New Jersey: Forbes; 2022. Available from: https://www.forbes.com/sites/andrewdepietro/2022/05/17/us-gdp-by-state-and-fastest-growing-states-by-gdp-growth/?sh=22ec98535a72 [Last accessed on 2023 Aug 24].
12. Lad. 2020's states with the best and worst dental health-WalletHub study. Pennsylvania Office of Rural Health; 2020. Available from: https://www.porh.psu.edu/2020s-states-with-the-best-worst-dental-health-wallethub-study [Last accessed on 2023 Aug 24].
13. Rakich N. How urban or rural is your state? And what does that mean for the 2020 election? FiveThirtyEight; 2020. Available from: https://fivethirtyeight.com/features/how-urban-or-rural-is-your-state-and-what-does-that-mean-for-the-2020-election [Last accessed on 2023 Aug 24].
14. Morlang WM. Dentistry's vital role in disaster preparedness. J Calif Dent Assoc 1996;24:63-6.
15. Li G, Chang B, Li H, Wang R, Li G. The role of dental professionals in pandemic events and disaster responses. Disaster Med Public Health Prep 2021;15:785-9.
16. Dentists help to deliver babies in NHS Coronavirus effort; 2020. Available from: https://dentistry.co.uk/2020/04/15/dentists-help-deliver-nhs-coronavirus [Last accessed on 2023 Aug 24].
17. Liang XH, Tang YL, Luo E, Zhu GQ, Zhou H, Hu J, *et al*. Maxillofacial injuries caused by the 2008 Wenchuan earthquake in China. J Oral Maxillofac Surg 2009;67:1442-5.
18. Products-data briefs-number 412; 2021. Available from: https://www.cdc.gov/nchs/products/databriefs/db412.htm [Last accessed on 2023 Aug 24].

How to cite this article: Verma SR. Socioeconomic health and the scope of dental practice. J Global Oral Health 2023;6:97-100.