









Model Proposal for Equity Production in Access to Dental Specialty Centers

Jozildo Morais Muniz Filho¹, Maria Alice da Silva Ferreira¹, Debora Lana Alves Monteiro²,
Gabriela de Nazaré Wanderley Lira³, Túlio Pessoa de Araújo⁴, Anna Karina Barros de Moraes
Ramalho⁵, Mariana Pereira dos Santos Targino⁵, Wilton Wilney Nascimento Padilha⁵

¹School of Dentistry, Federal University of Paraíba, João Pessoa, PB, Brazil.

²School of Dentistry, University Center of Patos, Patos, PB, Brazil

³Post-graduate Program in Dentistry, Federal University of Paraíba, João Pessoa, PB, Brazil.

⁴Department of Restorative Dentistry, School of Dentistry, Federal University of Paraíba, João Pessoa, PB, Brazil.

⁵Post-graduate Program in Collective Health, Health Sciences Center, Federal University of Paraíba, João Pessoa, PB, Brazil.

Corresponding author: Jozildo Morais Muniz Filho

E-mail: jmmf@academico.ufpb.br

Academic Editor: Yuri Wanderley Cavalcanti

Received: October 11, 2023 / **Review:** December 12, 2023 / **Accepted:** January 18, 2024

How to cite: Muniz Filho JM, Ferreira MAS, Monteiro DLA, Lira GNW, Araújo TP, Ramalho AKBM, et al. Model proposal for equity production in access to dental specialty centers. *Pesqui Bras Odontopediatria Clín Integr.* 2024; 24:e230198. <https://doi.org/10.1590/pboci.2024.061>

ABSTRACT

Objective: To address disparities in oral healthcare to allow prioritization of individuals with higher vulnerability. The model seeks to develop a methodology for identifying and classifying vulnerability among CEO users using socioeconomic indicators. Additionally, it aims to establish criteria for access prioritization based on vulnerability profiles, ultimately ensuring that those in greater need receive the specialized oral healthcare they require. **Material and Methods:** The proposed method leverages two key indicators: the Municipal Social Vulnerability Index (IVS) and the CEO Social Vulnerability Indicator (CEO IVS). CEO IVS is calculated based on CEO user socioeconomic data and compared to the municipality's IVS. The model utilizes a scoring system to classify users' vulnerability levels, allowing for the identification of those most in need of specialized care. The Equality Production Trend Indicator (ITPE-CEO) assesses the alignment between CEO and municipal vulnerability levels, aiding access prioritization. **Conclusion:** This equity-focused model offers a practical approach to address disparities in oral healthcare access. Vulnerability profiles and socioeconomic factors empower local managers to allocate resources effectively, ensuring that individuals with higher vulnerability receive timely and specialized care. The proposed model promotes inclusivity and responsiveness to community needs, contributing to achieving equitable oral healthcare for all.

Keywords: Social Vulnerability; Health Equity; Secondary Care; Dentistry.

Introduction

Access to oral health services is usually studied using socioeconomic indicators as contextual variables to identify inequalities in this access [1]. These macrostructural indicators are highly useful for central-level planners (for example, they help determine where the service is most needed by assessing local vulnerability and available coverage). Still, they offer limited assistance to local healthcare unit managers (who need to prioritize among users seeking the service).

In recent literature, different branches of science have converged toward the concept of vulnerability. In the public health field, this concept's analysis can catalyze a transformation in care practices, promoting comprehensiveness and equity in healthcare [2].

The concept of vulnerability emerged as a response to the limitations of using the term "risk" in health [2]. While risk focuses on identifying individuals and characteristics that make them more or less susceptible to adverse health events, vulnerability considers probabilities and chances of population groups getting sick or experiencing adverse consequences. Thus, in the analysis of the health-disease process, risk represents probabilities, while vulnerability emerges as an indicator of social inequality and inequity [3,4].

In primary care literature, some research uses instruments to understand and assist in organizing and prioritizing individuals in situations of greater vulnerability to access oral health services within the Family Health Strategy (FHS) [5-9].

The demand for appointments in specialized care can further accentuate health inequalities, especially in vulnerable contexts. Access to secondary care services can metaphorically be illustrated as a "funnel" to which many individuals seek access. Still, only a few can achieve the desired goal of receiving effective care [10]. Thus, creating tools based on criteria for access prioritization emerges as an effective option to achieve equity, aiming to provide healthcare actions and services according to individual needs.

This work proposes a methodology that allows Dental Specialty Centers (CEO) managers to establish criteria that contribute to achieving equity in access. This methodology considers the possibility that the profile of a representative set of CEO users with vulnerability differing from the social vulnerability profile of the municipality measured by the Social Vulnerability Index (IVS) [11] may imply an increase or decrease in social inequalities, depending on the direction of this difference. This difference, through the actions of the CEO, could create a condition where individuals in greater vulnerability have less access to specialized oral healthcare.

To support this prioritization, we present a proposal for identifying and contextualizing the vulnerability of CEO users, using two indicators: the Municipal IVS, developed and calculated by IPEA (Institute for Applied Economic Research) based on IBGE (Brazilian Institute of Geography and Statistics) data [11], and the CEO IVS.

Material and Methods

The CEO Social Vulnerability Indicator (CEO-IVS) is based on the socioeconomic data of CEO users, characterizing their profile regarding a vulnerability indicator. The proposed user vulnerability score uses eight questions from Module III of the PMAQ-CEO (Dental Specialty Center Access and Quality Improvement Program) 2nd Cycle [12], containing user responses in the "1. User Identification" section. The answers were categorized and dichotomized to select more vulnerable conditions (1 point) or less vulnerable (zero points). Thus, a user with a scores equal to 8 would denote a high vulnerability profile, while a sum equal to zero would indicate a low vulnerability profile (Table 1).

Table 1. Score assigned to responses to questions from module III of the external evaluation of the 2nd Cycle of PMAQ-CEO for user classification according to vulnerability criteria.

Question	Answer	Score
Among the options I am going to read, what is your race or ethnicity?	White	0
	Other	1
Where's your home located?	Urban area	0
	Rural area	1
Is your home covered by the Family Health Strategy?	Yes	0
	No	1
How many people live in your home, including yourself?	From 1 to 3	0
	More than 3 people	1
Until what level of education did you complete?	At least Complete High School	0
	Not literate to Incomplete High School	1
Do you have any paid employment currently?	Yes	0
	No	1
What is your family income?	Above 1 minimum wage*	0
	From no income to 1 minimum wage	1
Regarding the "Bolsa Família Program**", does your family:	Do not participate	0
	Participate or have participated	1

*In the context of Brazil, "minimum wage" refers to the minimum monthly wage set by the government; **The *Bolsa Família* Program in Brazil provides financial assistance to low-income families, promoting poverty reduction and access to essential services.

Discussion

The CEO Social Vulnerability Indicator (CEO-IVS) is derived from the aggregated scores obtained from CEO users. These scores, resulting from the summation of responses to specific questions in Module III of the PMAQ-CEO, will be utilized to gauge the social vulnerability of individual users. This method aims to capture essential socioeconomic aspects influencing vulnerability. This data collection process will be carried out at the individual level, and professionals engaged in direct healthcare provisions, such as dentists, nurses, or community health workers, will be responsible for collecting this information during regular patient interactions within the oral healthcare context.

Once the CEO IVS is computed for each user, a value ranging from 0 to 1 will be assigned. This value signifies the level of social vulnerability the user exhibits, where "0" indicates users with minimal social vulnerability, while "1" corresponds to those with the highest social vulnerability. This quantitative indicator will then be correlated with the Municipal IVS, which encompasses an assessment ranging from 0 to 1, reflecting the social vulnerability of the municipality. The Municipal IVS is a composite index derived from diverse socioeconomic indicators, including Urban Infrastructure IVS, Human Capital IVS, and Income and Employment IVS, each calculated from census-derived variables.

The proposed approach involves integrating individual user data from the CEO IVS and juxtaposing it with the broader context indicated by the Municipal IVS. This comparative analysis will aid in contextualizing the social vulnerability levels of users within the larger municipal framework. The collection of this data and subsequent analysis will serve as a foundation for identifying and prioritizing individuals requiring heightened access to oral health care services, thereby contributing to the equitable allocation of resources and service delivery. The sum of the scores of CEO users will be used to configure the CEO Social Vulnerability Indicator (CEO IVS).

After calculating the CEO IVS, a value ranging from 0 to 1 can be obtained. The "zero" value denotes service to users with very low social vulnerability, while the "1" value corresponds to service to users with very high social vulnerability. This value will be related to the municipality's context through a comparison with the Municipal IVS, which, according to the Institute of Applied Economic Research [11], also varies from 0 to 1, where "0" corresponds to the ideal situation, very low social vulnerability, and "1" corresponds to the worst

situation, very high social vulnerability. The Municipal IVS is the result of the arithmetic mean of the sub-indices "Urban Infrastructure IVS", "Human Capital IVS", and "Income and Employment IVS", using sixteen indicators calculated from the variables of the last census.

The Municipal IVS has five qualitative-ordinal intervals: from 0 to 0.200, corresponding to the ideal situation, very low social vulnerability; from 0.201 to 0.300, low social vulnerability; from 0.301 to 0.400, medium social vulnerability; from 0.401 to 0.500, high social vulnerability; and from 0.501 to 1, corresponding to the worst situation, very high social vulnerability [11]. Similarly, the CEO IVS will follow the five qualitative-ordinal intervals of the Municipal IVS, making it possible to classify the CEO as having very low, low, medium, high, or very high social vulnerability.

The ITPE (Equality Production Trend Indicator) in access is obtained by comparing the social vulnerability ranges of the Municipal IVS and CEO IVS. When the municipality's social vulnerability range is higher than the CEO's, there is a pro-inequity trend. When the ranges are equal, there is a neutrality trend. When the municipality's social vulnerability range is lower than that of the CEO, there is a pro-equity trend.

The IVS is a nationwide indicator of the vulnerability of a municipality, and its objective is to support the development of public planning and territorial management policies. The literature records two studies in dentistry in Brazil that use the IVS to dichotomize social vulnerability (high/low) geographically; that is, they collect clinical data from schoolchildren (orthodontic needs and dental trauma) in neighborhoods with antagonistic IVS [13,14]. The Figure 1 summarizes the proposed approach.

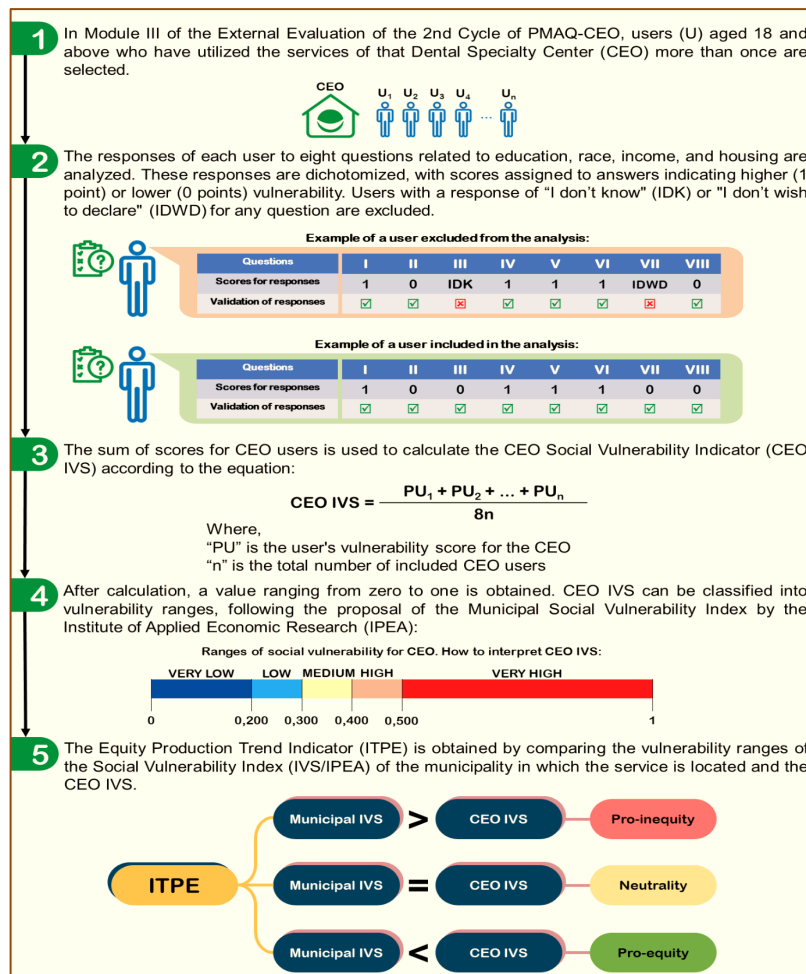


Figure 1. Flowchart of the Equity Production Trend Indicator (ITPE) in dental specialty centers.

The identification of vulnerability levels among CEO users can be done by local managers using PMAQ-CEO data [12] or by collecting information directly from patient records, such as participation in social assistance programs, income, education, or other factors. Managers could also expand and update the sample to identify profiles with greater or lesser frequency to maintain its validity.









Local managers can identify vulnerability levels among CEO users by using PMAQ-CEO data [12] or by collecting information directly from patient records, such as participation in social assistance programs, income, education, or other relevant factors. It's essential to consider the temporal aspect, particularly noting the conclusion of the program and the date of the last evaluation when utilizing PMAQ-CEO data for assessing user vulnerability, which ended in the 2nd Cycle held in 2018. Managers should account for these temporal aspects to ensure the accuracy and relevance of the identified profiles, considering any changes or developments since the program's conclusion. Additionally, expanding and updating the sample would be beneficial to maintain the validity of the assessment.

We believe the ITPE proposal can contribute to equity in oral health care due to its ease of application, adaptability to each CEO's context, and autonomy. Still, implementing ITPE can constitute a tool that will systematically identify user vulnerability levels, providing the managers valuable information to prioritize access to secondary oral health care, especially for individuals in conditions of greater vulnerability, in harmony with proposals for equity in access.

Conclusion

This equity-focused model offers a practical approach to address disparities in oral healthcare access. Vulnerability profiles and socioeconomic factors empower local managers to allocate resources effectively, ensuring that individuals with higher vulnerability receive timely and specialized care. The proposed model promotes inclusivity and responsiveness to community needs, contributing to achieving equitable oral healthcare for all.

Authors' Contributions

JMMF		https://orcid.org/0000-0002-0317-3797	Conceptualization, Methodology, Formal Analysis and Writing - Original Draft.
MASF		https://orcid.org/0000-0002-6160-1788	Methodology and Writing - Original Draft.
DLAM		https://orcid.org/0000-0002-4731-6737	Methodology and Writing - Original Draft.
GNWL		https://orcid.org/0000-0002-2685-8166	Conceptualization, Methodology, Formal Analysis and Writing - Original Draft.
TPA		https://orcid.org/0000-0001-6510-8571	Methodology and Writing - Review and Editing.
AKBMR		https://orcid.org/0000-0003-0909-1634	Conceptualization, Methodology and Writing - Review and Editing.
MPST		https://orcid.org/0009-0002-5255-6636	Methodology and Writing - Review and Editing.
WWNP		https://orcid.org/0000-0003-3056-9145	Conceptualization, Methodology, Validation, Formal Analysis, Writing - Original Draft and Writing - Review and Editing.

All authors declare that they contributed to critical review of intellectual content and approval of the final version to be published.

Financial Support

None.

Conflict of Interest

The authors declare no conflicts of interest.

Data Availability

The data used to support the findings of this study can be made available upon request to the corresponding author.

References

- [1] Herkrath F, Castro P, Figueiredo N, Vieira JMR, Rebelo MAB. Equity in the accessibility to specialized care in oral health in Brazil: Analysis of PMAQ-CEO external evaluation data according to the user's perspective. *Pesqui Bras Odontopediatria Clin Integr* 2018; 18(1):e3175. <https://doi.org/10.4034/PBOCI.2018.181.41>
- [2] Dimenstein M, Cirilo Neto M. Conceptual approaches to vulnerability in health and social care. *Pesqui Prát Psicossociais* 2020; 15(1):1-17.
- [3] De Carvalho Mesquita Ayres JR, Paiva V, França I, Gravato N, Lacerda R, Della Negra M, et al. Vulnerability human rights, and comprehensive health care needs of young people living with HIV/AIDS. *Am J Public Health* 2006; 96(6):1001-1006. <https://doi.org/10.2105/AJPH.2004.060905>
- [4] Bertolozzi MR, Nichiata LYI, Takahashi RF, et al. The vulnerability and the compliance in Collective Health. *Rev Esc Enferm USP* 2009; 43(Spe 2):1320-1324. <https://doi.org/10.1590/S0080-62342009000600031>
- [5] Coelho FLG, Savassi LCM. Application of the Family Risk Scale as an instrument for prioritizing home visits. *Rev Bras Med Família Comunidade* 2004; 1(2):19-26. [https://doi.org/10.5712/rbmfc1\(2\)104](https://doi.org/10.5712/rbmfc1(2)104)
- [6] Nascimento FG do, Prado TN do, Galavote HS, Maciel PA, Lima RCD, Maciel ELN. Applicability of the risk scale to the organization of the work process with families in a health care unit in the city of Vitória, Espírito Santo State. *Cien Saude Colet* 2010; 15(5):2465-2472. <https://doi.org/10.1590/S1413-81232010000500021>
- [7] Savassi LCM, Lage JL, Coelho FLG. Systematization of a stratification questionnaire for family risk: Coelho-Savassi's Family Risk Scale. *J Manag Prim Heal Care* 2013; 3(2):179-185. <https://doi.org/10.14295/jmphc.v3i2.155>
- [8] Peres Neto J, Mendes KLC, Wada RS, Sousa MLR. Relationship between risk classifications used to organize the demand for oral health in a small city of São Paulo, Brazil. *Cien Saude Colet* 2017; 22(6):1905-1911. <https://doi.org/10.1590/1413-81232017226.00702016>
- [9] Moimaz SAS, Okamura AQC, Nayme JGR, Cecilio LPP, Garbin CAS, Saliba TA, et al. Municipal organization of dental services: case study. *Arch Health Invest* 2017; 6(8):371-376. <https://doi.org/10.21270/archi.v6i8.2092>
- [10] Gawryszewski ARB, Oliveira DC, Gomes AMT. Access to SUS: representations and practices of professionals developed in Regulation Centers. *Physis Rev Saúde Coletiva* 2012; 22(1):119-140. <https://doi.org/10.1590/S0103-73312012000100007>
- [11] Costa MA, Marguti BO. Atlas da Vulnerabilidade Social nos Municípios Brasileiros. Brasília: IPEA; 2015. 77p. [In Portuguese].
- [12] Goes P, Figueiredo N, Martelli P, Luvison IR, Werneck MAF, Ribeiro MAB, et al. Theoretical and methodological aspects of the external evaluation of the improvement, access and quality of centers for dental specialties program. *Pesqui Bras Odontopediatria Clin Integr* 2018; 18(1):e3433. <https://doi.org/10.4034/PBOCI.2018.181.60>
- [13] Pereira NNR, Paiva SM, Sá EM de O, Pinto RS, Lucas SD. Sentinel event in oral health: experience with children with up to six years of age, users of the Unified Health System. *RGO* 2018; 66(2):129-135. <https://doi.org/10.1590/1981-863720180002000043336>
- [14] Peres Neto J, Cortellazzi KL, Sousa M da LR de. Organization of demand in oral health and family vulnerability. *Cien Saude Colet* 2021; 26(suppl 2):3623-3633. <https://doi.org/10.1590/1413-81232021269.2.21852019>