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Examining the Impact of Social Vulnerability and Dental Provider Availability on Spatial Patterns of Emergency Dental Care Utilization

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Abstracts

Our goal was to investigate the relationship between the availability of dental providers, the ZIP code social vulnerability index, and the usage of emergency dental treatment. Methods: Using extended spatial two- stage least-squares to account for geographical correlation, this cross- sectional observational analysis mapped differences in emergency dental treatment and examined their relationship to social vulnerability. We used secondary data from the US Census American Community Survey, InfoUSA, and the Maryland Health Services Cost Review Commission to perform spatial autoregressive modeling to investigate the impact of dental provider capacity and social vulnerability on emergency care use across neighboring counties, taking into account ZIP Code Tabulation Area (ZCTA) spillover effects. Using emergency department visits and inpatient stays per 1000 persons for dental diseases as the dependent variable, we examined the use of emergency dental treatment in ZIP Code Tabulation Areas. Conclusions The usage of emergency dental care was associated with social vulnerability and the availability of dental providers.

Keywords: Oral health, dental, emergency dental care, dental care.

1. Introduction

Millions of Americans suffer from untreated dental illness, a serious public health issue that affects not only oral health but also physical function because of pain, children's learning capacities, and employment prospects. Emphasizing the silent epidemic of oral health inequities and their impact on quality of life, the Surgeon General's 2000 Report emphasized the link between oral and general health. Along with nutritional deficits, oral disorders including tooth caries and periodontal disease have been closely associated with long-term health issues like diabetes and heart disease (Lin M, 2016).

The most common reason for ED visits for non-traumatic dental illnesses (NTDCs) is untreated dental infections, such as abscesses. Evidence suggests that the risk of dental disease is successfully reduced by routine oral examinations, good oral hygiene practices, and evidence-based preventive therapy. Emergency department visits brought on by untreated dental disease,

however, continue to be a major public health concern.The United States is not the only country bearing this load. Over 3.5 billion individuals worldwide suffer from untreated dental disease, making it a serious problem. Similar differences exist in other nations, such as low- and middle-income countries, where there is a lack of access to preventive and restorative dental treatment, leading to a higher use of emergency dental care (Slade , 2001).

People who are uninsured or have public insurance often do not receive timely restorative dental care as well as preventive care. Because essential treatment is frequently postponed until symptoms become emergencies, oral health with public coverage continues to be a policy concern, prompting people to seek rapid care for avoidable dental concerns in hospital emergency rooms. The necessity of including oral health within primary healthcare frameworks across the globe has been underlined by the World Health Organization's (WHO) Global Strategy on Oral Health (GOHAP). These international programs seek to enhance access to preventative services and lessen inequities, which are issues in both developed and developing nations' healthcare systems (Jackson, 2011).

This study calculated the relationship between Maryland residents' social vulnerability and unmet dental requirements as well as the geographic accessibility of dental providers. We used ED care use to measure unmet dental needs. We postulated that Maryland towns with a greater number of dental professionals would have easier access to preventative and restorative care, hence reducing the number of unmet dental needs and emergency dental service utilization.

Dental Providers and preventive care:

Our findings reveal that overcoming social vulnerability-related obstacles to care is essential, even when boosting geographic provider availability may not completely reduce the need for emergency services. Increasing dental providers may improve preventative care and decrease crises. Legislators must to think about all-encompassing plans to enhance access to dental care and remove obstacles caused by social vulnerability (Seirawan, 2012).

Geographic accessibility may not be the only factor contributing to ED utilization; other obstacles that prevent regular dental care access may also be at play. According to earlier studies, these obstacles could include a lack of ambulatory care hours in rural areas, a decline in rural residents' perceptions of their needs, and financial obstacles brought on by fewer insurance benefits for rural residents with private insurance and trouble enrolling in Medicaid (Halasa, 2019).

This study presents a nuanced perspective, indicating that a number of factors other than distance affect access to care. Social vulnerability creates conflicting barriers that influence ED visits versus routine care. The inaccessibility of dental offices confuses assumptions about ED visits, even while longer commutes to rural EDs are associated with office care consumption (Sheller , 2009).

The global oral health agenda:

The Global Strategy on Oral Health's six guiding principles serve as the foundation for the global oral health agenda and guide the creation of the WHO GOHAP for 2023–2030. Adopting a public health approach, incorporating oral health into primary healthcare, using creative workforce

models, offering people-centered care, customizing interventions across the lifespan, and utilizing digital technologies to improve oral health outcomes are some of the principles that are intended to facilitate implementation in member states (Allareddy , 2014).

Our results are consistent with international trends seen in nations like the UK, Canada, and Australia, where greater use of emergency dental care is similarly associated with greater social vulnerability. This uniformity across various healthcare systems raises the possibility that initiatives like lowering socioeconomic obstacles and increasing provider availability may be more broadly applicable and adaptable abroad. These findings, which are consistent with the WHO GOHAP, highlight the necessity of all-encompassing worldwide approaches to incorporate oral health within primary healthcare frameworks (Seirawan , 2012).

2. Recommendations:

- There are certain points of this study that need to be clarified. Since some dental providers work part-time in safety net clinics and Federally Qualified Health Centers (FQHCs), which are not usually included in InfoUSA data, the numbers of dental providers derived from InfoUSA Business Layout may undercount dentists in low- income and rural locations. The figures may have been impacted since dental practices housed within bigger medical facilities were not classified as dental offices. Errors in the ICD-10-CM coding of dental-related emergency department visits may result in patient misclassification, which could compromise the accuracy of the data. The SAR models may experience spillover effects as a result of the 54 Maryland ZCTAs being excluded.

- There might not be much generalizability outside of Maryland. The utilization of emergency dental treatment may contribute to or result from social vulnerability. In a similar vein, social vulnerability may result in limited access to dental care, and social vulnerability may worsen as a result of restricted dental care access. However, the study offers a number of advantages. For instance, it is the first to look at the relationship between Maryland's dental care and the Social Vulnerability Index (SVI). A variety of ICD-10-CM codes that cover different dental conditions as specified by Chalmers in 2017 were also added. By taking a thorough approach, we were able to investigate the complex connections between social vulnerability and the demand for emergency dental care in various demographic groups.

3. Conclusion:

In Conclusion, The results show that a lack of providers in socially vulnerable areas increases the need for emergency dental care, which affects neighboring communities. Even with more providers available, addressing social vulnerability is essential to lowering emergency dependency. Reliance on emergency room and inpatient hospital care for avoidable non-traumatic dental diseases can be decreased by increasing the number of dental professionals available. The study emphasizes how systemic obstacles and social vulnerabilities affect access to healthcare. Reducing emergency dental care and untreated problems requires a larger workforce of accessible providers. It is crucial to develop Medicaid dental coverage policies.

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