CHALLENGES AND STRATEGIES TO IMPROVE ACCESS TO ORAL HEALTH CARE IN RURAL AMERICA

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I. Introduction & Problem Statement

Rural America is home to nearly 20% of the US population.[1] Individuals living in rural areas face unique oral health challenges resulting in pronounced disparities in their health and wellbeing. **This White Paper provides an overview of oral health status in rural communities, identifies important factors contributing to oral health disparities, and shares strategies, evidence-based practices, and models to improve oral health among rural Americans.** For the purpose of this paper, rural is defined broadly and includes areas that are not urban or suburban.

Oral health is an integral component of overall health and wellbeing. Poor oral health is associated with various systemic health conditions and can affect the quality of life.[2] Routine oral health care examinations and services can help detect and address oral diseases early. According to the 2021 Oral Health in America: Advances and Challenges Report from National Institute of Dental and Craniofacial Research (NIDCR), almost 60 million Americans reside in rural areas, and 34 million live in dental health professional shortage areas.[3] Residents of rural areas experience worse oral health outcomes across the lifespan compared to urban populations.[4] **The causes of poor oral health outcomes in rural communities are multifactorial, including fewer dentists, significant distance to access dental care, lower dental insurance coverage.** In addition to these structural barriers to care, dental anxiety, cultural norms, health literacy, perceived belief for the need of oral health care, non-adherence to preventive behaviors may also contribute to rural-urban disparities in oral health outcomes.[5, 6] Moreover, rural communities face additional barriers, such as a higher proportion of the aging population, as well as poverty. There is a need to identify and scale promising and innovative programs and adopt necessary policy changes to help reach these communities.

II. Oral Health in Rural America

Persistent, Recent, and Emergent oral health challenges facing rural communities

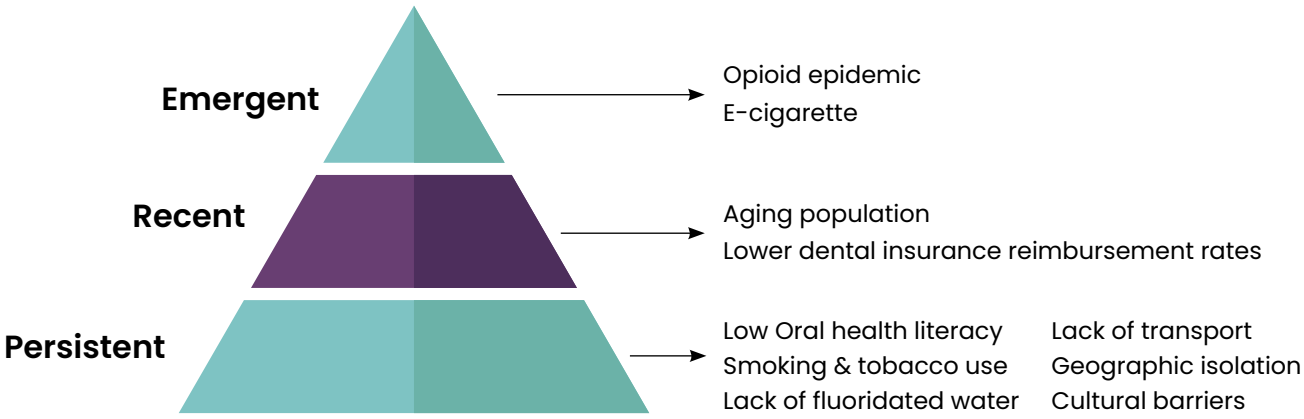

Figure 1 - Persistent, recent, and emergent oral health challenges using the AHA model as a framework for oral health challenges in rural communities.

1 The American Hospitals Association (AHA) in 2018 identified challenges and barriers faced by rural healthcare communities and facilities that serve them and grouped them as persistent, recent, and emergent. [5] Similar relatable challenges are observed at rural oral health care communities and facilities.The figure 1 is built using the AHA model as a framework and highlights oral health challenges in rural communities.

Profound disparities exist in oral health and access to oral health care among rural communities.[7, 8] Compared to their urban counterparts, rural adults are more likely to have untreated dental caries (32% vs. 25%), periodontal disease (28% vs 19%), and edentulism (16% vs 9%).[9] Rural adults were more likely to report having unmet dental care needs, have few dentists, and are less likely to have visited a dentist in the past year. Additionally, a higher percentage of rural children, compared to those residing in urban areas, are less likely to have received fluoride treatment (46.6% versus 52.5%), and a dental sealant (19.5% versus 22%).[10] Below are some of the primary issues and barriers to oral health in rural areas.

Oral Health Utilization and Dental Insurance Coverage

Utilization of dental care differs between urban and rural populations. Approximately 2 in 5 rural Americans lack oral health care access.[11] Results from the 2018 National Health Interview Survey showed that 62% of children aged 2+ years living outside of a metropolitan statistical area (MSA) reported that they had visited the dentist in the past year, compared to 71% of those living within an MSA. People living in rural areas are more likely to use emergency departments for oral health needs than their urban counterparts.[12] Some of the most common barriers to access to oral health care for rural populations include inadequate supply of dentists [13, 14]. A CareQuest study found that more rural residents cited 'no insurance' as a reason for not seeing a dentist compared to their urban and suburban counterparts.[4]

Social determinants of health further broaden the disparities in rural oral health. Rural residents are more likely to receive dental coverage through Medicaid and Medicare, however, dental coverage for adults in Medicaid varies by state and traditional Medicare does not cover dental services. Nonelderly adults in rural areas living in states that did not expand Medicaid program under Affordable care act were nearly twice as likely to be uninsured as those living in the states that expanded Medicaid (15% vs. 9%). [15] Furthermore, recruitment and retention of dentists to rural areas is an ongoing challenge resulting in large number of DPHSAs in rural areas and further complicating the delivery of oral health services among population with limited or no dental coverage.[16]

Access to Fluoridated Water

Water fluoridation is one of the top 10 public health achievements of the 20th century, which prevents tooth decay by ensuring that teeth have frequent contact with optimal levels of fluoride.[17] Community water fluoridation is a highly cost-effective way to disperse fluoride to a population independent of age, race/ethnicity, or socioeconomic status. The National Advisory Committee on Rural Health and Human Services in 2018 identified a lack of fluoridated community water as an important barrier to oral health care in rural America.[18] Rural populations are less likely to have access to adequately fluoridated drinking water. A study published in 2011 found that 61% of non-metropolitan residents had access to fluoridated public drinking water compared to 73% in metropolitan areas. Furthermore, rural populations (33%) are more likely to rely on domestic wells, which likely have non-fluoridated water, rather than treated water systems, compared to people in urban counties (24%).[19]

Smoking and Oral Health

Smoking and tobacco use is more prevalent among the rural population. Almost one-quarter (24%) of rural adolescents and adults smoked compared to 21% of their counterparts in urban areas.[20] This may be due to the past targeted ad campaigns by the tobacco industry. Over the last few decades, although there has been a decrease in cigarette smoking prevalence, other forms of tobacco such as e-cigarettes have gained popularity. Higher tobacco use, combined with lower rates of cancer screening and a lack of oral health literacy and awareness of cancer risks, can lead to poor oral health outcomes and an increase in oral cancer rates.[21]

Opioid Use and Oral Health

Prescription or non-prescription use and misuse of opioids remains a growing public health problem in general and is concentrated in areas of the US states with large rural populations. Drug overdose (prescription drugs, fentanyl, heroin) is one of the leading causes of injury-related deaths in the US, with rural populations largely being affected by it. Prescription drug overdose-related deaths contributed to nearly 40% of the injury-related deaths, and rose from 20,000 deaths in 1990 to nearly 92,000 deaths in 2020.[22] During the same time period, the rate of drug overdose deaths increased from 4.0 per 100,000 to 19.6 in rural counties, compared to from 6.4 to 22.0 in urban counties. Dentists are one of the top prescribers for opioids and accounted for nearly 15% of all immediate-release opioid prescriptions in 1998 and decreased to 6.4% in 2012.[23] The rates of opioid prescription have decreased partly due to the awareness and leadership provided by the professional and federal organizations such as ADA, CDC, and NIH. However, the number of opioid prescriptions per 1,000 dental patients increased in patients 11–18 years of age.[24] Also dentists prescribe a disproportionate share of opioids for adolescents, accounting for 31% of all opioids prescriptions for patients aged 10 through 19 years. Emergency department physicians and nurse practitioners are also one of the main sources of opioid prescriptions for the management of acute dental pain.[25]

III. Approaches to improve oral health in rural communities

Following are some of the key strategies and successful models that can improve oral health among rural populations and help in addressing the challenges faced by these communities.

A. Increasing Access to Oral Health Care: Delivery Systems and Insurance

Dental Insurance

Large proportion of individuals lack dental insurance and cost remains the common reported barrier in accessing dental care. Medicaid plays a large role in covering rural populations and serves as a source of health care coverage for the 60 million Americans living in rural areas,[1] but dental coverage for adults under Medicaid remains optional and is not covered beyond emergency coverage in many states.[15] Rural residents in general have worse health outcomes and tend to be older, poorer, less healthier and have lower levels of education than their urban counterparts. Under the Accountable Care Act, States that expanded Medicaid experienced larger gains in health coverage in rural areas and reduction in uninsured rate from 17% to 12% between 2013-2015.[15] In order to improve access to oral health in rural areas and reduce health disparities, it is important to support health coverage through Medicaid expansion and by expanding dental coverage for adults which can improve access of oral health services.

Integrating Dental Care in Primary Care

Dental professional shortage in rural areas is one of the primary factors impacting access to oral health services. Thus, identifying alternative ways to deliver dental services is essential. Medical-dental integration is an approach to care that integrates and coordinates dental care into primary care and behavioral health to support individual and population health. Primary care providers can play an important role in improving the patient's oral health by screening for oral diseases, conducting risk assessment and oral examinations, educating patients on dental disease and self-care preventive strategies, recommending/prescribing preventive services such as fluoridated mouthwash and behavioral modification, and identifying dental providers and making appropriate referrals for dental care. They can also help address the lack of dental care provider availability to some extent by providing some basic services, especially conducting oral health screening and applying fluoride varnish. The US Department of Health and Human Services' (HHS) Oral Health Strategic Framework: 2014-2017,[26] identified the integration of oral health and primary care as the number one goal in improving oral health disparities. Integration of oral health services in primary care usually involves co-location of services in rural community health clinics, which improves communication and coordination between dental and primary care providers. Health centers, especially Federally Qualified Health Centers (FQHCs), play a crucial role in reducing oral health disparities and improving access to oral healthcare services.[27] They are major providers of primary care services for disadvantaged Americans, including rural America. The Integration Initiative by HRSA has created a set of oral health core clinical competencies and implementation strategies appropriate for primary care clinicians[28] that can be used to successfully integrate oral health in routine care. Some successful models are:

MORE Care Initiative connects Rural Health Clinics (RHCs) with dental care partners and develops referral networks between primary care and oral healthcare providers. MORE Care has led to increases in preventive dental services such as fluoride varnish administration, improvement in interprofessional communication, and patients' improved daily home oral health care.[29] To date, four states have participated in MORE Care: South Carolina, Pennsylvania, Colorado, and Oregon.

- Medical Oral Expanded Care (MORE Care) in Oregon[29]
  https://www.ruralhealthinfo.org/project-examples/958

Project Zero – Women and Infants' (PZWI) goal is to expand opportunities for access to direct oral health services and increase delivery of best practices for oral healthcare. The project is supported by the Perinatal and Infant Oral Health Quality Improvement Initiative to reduce the prevalence of oral disease in pregnant women and infants through improved access to high-quality oral health care.

- Project Zero – Women & Infants in Arizona[30]
  https://in.nau.edu/project-zero

Rural Health Clinics (RHCs) - This program is a partnership among the DentaQuest Partnership, State Offices of Rural Health to integrate and coordinate oral health into primary care. Participating Rural Health Clinics learned how to incorporate oral health risk assessment, oral health self-management, fluoride varnish application, and referrals to local dental offices.

- Pennsylvania Rural Primary Care Oral Health[31]
  https://www.porh.psu.edu

Teledentistry

Teledentistry is a type of telehealth that involves the use of electronic information, imaging and communication technologies, including interactive audio, video, data communications as well as store and forward technologies, to provide and support dental care delivery, including diagnosis, consultation, treatment, transfer of dental information and education.[32] The US military first used teledentistry in 1994 to serve the US troops.[33] It became widely used during the COVID-19 pandemic. ADA survey showed that 25% of responding dentists reported using teledentistry for problem-focused evaluation.[34, 35] Teledentistry was found to be comparable to in-office visits in some procedures, such as consultations in schools and in long-term healthcare facilities.[36, 37] Teledentistry can benefit rural populations and improve access to care by reducing access and transportation barriers to care . Using telehealth technology, dentists could share patient records, consult on treatment plans, and extend the reach of their practice by sending dental hygienists and therapists to community settings such as assisted living facilities, schools, and senior centers. This strategy can be used to provide preventive and diagnostic dental care to rural populations that would otherwise not receive it. Some successful models are:

- The SMILES Dental Project (https://smilesdentalproject.org).[38] It is a program in Colorado that uses a virtual dental home model, which uses telehealth technology to enable dental hygienists to deliver dental care in rural, underserved communities, under the supervision of a dentist who may be miles away in another community to eliminate barriers to oral health care.

- Capitol Dental Care's Virtual Dental Homes in Oregon.[39] (https://www.ruralhealthinfo.org projectexamples/987). It is a Virtual Dental Home teledentistry model to bring preventive dental care to some elementary schools and Head Start programs. An oral health service team of expanded practice dental hygienists and dental assistants provide routine dental services under remote supervision with a dentist using teledentistry.

Mobile Dental Services

Mobile dentistry refers to dental services offered outside of traditional dental offices using portable equipment or mobile dental vans. Mobile dentistry is carried out in places where people live, are cared for, go to school, and receive other healthcare. Dental services in rural areas are often delivered by dental hygienists and assistants and typically include screening, diagnostics, preventive care, and referrals. Mobile dental programs using vans or portable equipment can offer a range of services from basic preventive care to comprehensive treatment. These programs have been successfully implemented to increase access for rural populations, providing services such as cleanings, x-rays, and minor procedures in underserved communities.

*ADA survey showed that **25%** of responding dentists reported using teledentistry for problem-focused evaluation.*

Below are some examples of successful mobile dental programs that provide dental services to rural communities:

- Delta Dental Mobile Program provides oral healthcare services to children in rural and urban areas of South Dakota. [40](https://www.ruralhealthinfo.org/project-examples/626). Delta Dental of South Dakota Dental Mobile Program expands access to oral healthcare services to children throughout the rural state. The program utilizes two mobile dental clinic trucks and dental hygienists and community health workers based on the state's American Indian reservations. The Mobile Program serves approximately 6,250 kids across South Dakota every year.

- Miles for Smiles Mobile Dental Unit provides dental care for children in an 11-county region of southwest Missouri.[41] (https://www.ruralhealthinfo.org/project-examples/531). The Miles for Smiles mobile dental clinic expands dental care access to children lacking dental care in seven counties in southwest Missouri.

B. Increasing Access to Oral Health Care: Expanding Rural Oral Health Workforce

In 2013, the Federal Office of Rural Health Policy (FORHP) funded the development of a publicly available Rural Oral Health Toolkit to disseminate successful rural oral health care delivery models.[42] These resources may be utilized to train dental care providers who are already practicing or plan on practicing in rural settings. Additionally, it is vital that rural dental care in the form of didactic courses and onsite rotations is included in the curriculum both for pre-doctoral and post- doctoral dental, dental hygiene, and dental assistant course work.

Moreover, allowing oral health professionals to work at the top of their licenses can improve the supply of care, increase the reach of oral health services and address some of the barriers to access and utilization of oral health services in rural areas. The scope of practice for the following dental professionals can be expanded and evaluated to support the oral health needs in rural areas.

Dental Hygienists

Dental hygienists (DH) are integral to the oral health workforce team. They focus on preventive oral health care. In most states in the United States, the DHs work under the general, direct or indirect supervision of dentists. However, the scope of practice under general, direct or indirect supervision of DHs varies by state. There is huge state-based variance in DHs scope of practice regarding diagnosing and treatment planning ability, prescriptive authority, administration of local anesthetics, supervision of dental assistants, direct Medicaid reimbursements, and provision of sealant application. Expanding and unifying DHs' scope of practice has significantly improved access to dental care.[43, 44] DHs in public health programs have improved access to dental care in rural and socioeconomically disadvantaged communities. Direct access allows DHs to perform treatments and maintain patient care without the presence of a dentist. For example, many school-based oral health and sealant programs utilize DH to provide screening and preventive services and expand the reach of evidence-based services. Research has shown comparable, safe, and effective oral health services from DHs under direct care. [45] Thus, expanding dental hygienists' scope of practice through direct access at a national level has the potential to address oral health access issues in rural areas.

Dental Therapists

Dental therapists (DTs) are mid-level dental providers who provide routine preventive and restorative care. The workforce model of DTs was created as an additional primary dental care provider for dental services (e.g., oral exams, cleanings, restorations, and extractions) that functions under the supervision of a dentist to improve access in oral health professional shortage areas, especially the rural and tribal zones. Research has shown that DTs provide high-quality, cost-effective routine dental care and improve access to care in areas where practicing dentists are scarce.[46] Studies have also observed comparable results between DTs and dentists.[47] DTs have been an established and recognized workforce in other countries for decades, but in the United States, DTs were first recognized in Alaska only a few years ago. Following Alaska's footsteps, other states have implemented the dental therapist model to varying degrees. Currently, States that recognize DT include Alaska, Arizona, Colorado, Connecticut, Idaho, Michigan, Minnesota, Maine, New Mexico, Nevada, Oregon, Vermont, Washington, and Wisconsin. Over a dozen other states and Tribal governments are in the process of exploring authorization of dental therapists.[48]

Community Dental Health Coordinators

Community dental health coordinators (CDHCs) are a subgroup of the Community Health Workers (CHW), who bridge the link between clinic and community by care coordination.[49] The CDHCs can increase awareness and knowledge of oral health, thus influencing access and utilization of oral health care, especially among underserved rural communities.[50] CDHCs are effective liaisons between the community and health care setting and can improve health literacy by giving presentations to community members, utilizing motivational interviewing, and conducting one-on-one counseling. There are several training and certification programs at national and state level that train the CDHCs to address and improve the barriers to oral health access.[51] Some examples include the Regional Oral Health Pathway program,[52] Smiles for Life curriculum,[53] and Community Health Representative program.[54]

Foreign Trained Dentists

Utilizing foreign-trained dentists, with additional training, can be another strategy to meet the demand of the dental workforce in rural areas. The US has relied on foreign trained medical graduates to meet the demand of workforce shortages, especially in the HPSA's.[55, 56] This strategy can also be adopted and implemented in dentistry to increase the oral health workforce. Foreign trained medical graduates or International medical graduates (IMGs) make nearly one-fourth of the medical workforce.[57] The Conrad-30 program was created to increase the recruitment of IMGs in rural areas and has been very successful. Under this program, IMG's agree to work in a HPSA or rural areas for a period of 3 years in return for the visa policy waiver.[58]

In dentistry, currently foreign educated dentists (FEDs) are recruited without additional training to work at community health centers in Massachusetts and rural DPSAs in Minnesota.[59, 60] With their model, these two states have enforced the foreign educated dentists to work in underserved clinics/areas and improve the access to dental care, but there is no formal evaluation on to what extent this model has improved the access to care in these two states.

C. Addressing Opioid Crisis and Tobacco Use

Oral health professionals can play a significant role in reducing the burden of opioid abuse by reducing overall reliance on opioids for pain management, as well as implementing screening and use of drug monitoring programs.[61] With the increased prevalence of drug use in rural areas, it is important that dentists and hygienists are trained on pain management, proper use of opioids, screening, and drug monitoring as if they are trained to serve the oral health needs of the rural population.

ADA and NIH have partnered to provide evidence-based information to reduce the opioid prescriptions in dentistry. In 2016, CDC released the Guidelines for prescribing Opioids for chronic pain that covers 12 recommendations.[62] The guidelines integration in the hospital policies have helped in reduction of the ER related opioids prescription for dental related pain. Midcoast Maine Prescription Opioid Reduction Program is one such program, which through evidence-based clinical practice has observed a 17% reduction in their opioid prescription for management of dental pain.[63]

In 2018, ADA released policy statement, which has three components,[64]

1) Mandatory continuing education addressing opioids and other controlled substances
2) The CDC guidelines on statutory limits on prescription opioid dosages and a maximum duration of seven days for prescriptions treating acute pain
3) Registration and use of prescription drug monitoring programs (PDMPs) by dentists, to foster appropriate use, and to deter misuse and abuse of opioids.

Rural oral health professionals, medical providers, and hospital systems should utilize the evidence-based approach to care for dental-related pain. Mandatory CE, Prescription monitoring programs, access to historical prescription data, limiting the duration of the prescription, and talking to the patients can be some of the effective ways to combat opioid overdose.

Many studies have identified dentist's role in tobacco cessation and state the lack of consistency in employing these in the dental offices.[65, 66] Dentists are well positioned to identify tobacco users and provide cessation counseling. Brief behavioral counseling and pharmacological treatment by dentists is very effective.[67] However, compared to medical counterparts, dentists and dental hygienists show a lack of consistency or fall back in asking and providing tobacco counseling. Barriers to consistently implement tobacco cessation counseling in dental offices include lack of reimbursement, time, sufficient training, and referral resources. Many dental schools have implemented the tobacco cessation in the dental education to address the issue of lack of sufficient training. Dental boards may also contribute to help in this process by implementing mandatory continuing education credits for tobacco cessation. Organized dentistry can pursue legislature and insurance companies to sufficiently reimburse dentists for the tobacco cessation treatment and work along with anti-tobacco campaigners and social media influencers to target rural teenagers and adults.

Rural oral health professionals are uniquely positioned to combat opioid misuse and tobacco use through evidence-based pain management, screening, and preventive counseling.

D. Supporting Water Fluoridation

The Institute of Medicine's report, Advancing Oral Health in America, recommended preventive interventions to combat poor oral health outcomes, including community water fluoridation. [68, 69] Healthy People 2030 includes an oral health objective to increase the proportion of people whose water systems have the recommended amount of fluoride.[70] Few rural oral health programs have focused on community water fluoridation to assure that communities have access to adequately fluoridated drinking water.[19]

The National Advisory Committee on Rural Health and Human Services in 2018 identified lack of fluoridated community water as an important barrier to oral health care in rural America.[18, 71] There is a need to improve access to adequately fluoridated public water for rural populations. Education programs for the appropriate use of topical fluoride should be considered where most rural families rely on non-fluoridated well water. Water fluoridation programs may encounter many challenges, such as policy, technical, and logistical challenges. Thus, programs should actively involve community members, policymakers, and oral health professionals and work together to develop successful and sustainable coalitions and programs.

IV. Conclusion

Literature enumerated in this white paper shows clearly that disparity exists in oral health care for the rural populations of the United States. Compared with their urban counterparts, the rural population have greater financial barriers to oral health care services, absence of access to adequate preventive oral health services, and rely on fewer oral healthcare professionals to serve their needs. A variety of approaches and efforts to address these public health issues are outlined in this white paper. This white paper does not provide a comprehensive list of all tested strategies and models. No one approach will address and eliminate the existing oral health disparity in rural areas of the United States. A combination of these approaches and efforts needs to be undertaken to address the existing oral health disparity in rural areas of the United States.

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