Oral Health Disparities in Women within Rural Eastern North Carolina

Bertie, Camden, Chowan, Currituck, Dare, Gates, Hertford, Hyde, Martin, Northampton, Pasquotank, Perquimans, Tyrrell, and Washington Counties (Region 9)

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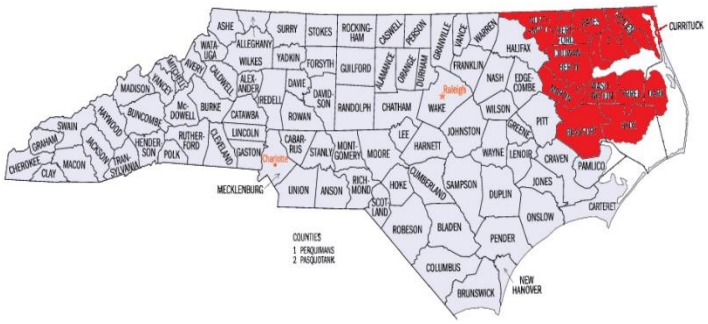
Introduction

Women are continually plagued by injustice and discrimination in healthcare throughout Region 9 North Carolina (which is composed of the following counties: Bertie, Camden, Chowan, Currituck, Dare, Gates, Hertford, Hyde, Martin, Northampton, Pasquotank, Perquimans, Tyrrell, and Washington, herein afterward interchanged with "rural Eastern N.C.").[i] Dental treatment, in particular, remains virtually non-existent in many medical care plans. Furthermore, for pregnant women living in North Carolina, the lack of state policy regarding oral health treatment is evident through the NC Public Health Prenatal Strategic Plan for 2016-2020, which fails to mention efforts to improve dental care for the population.[ii] Whether people utilize government or private health insurance, proper dental care often entails hidden fees and expenses that they simply cannot afford. However, for women using Medicaid benefits, a shortage of dental coverage and access to a dental office in rural Eastern North Carolina can present further barriers to appropriate care. Additionally, because people who live in N.C.'s rural counties often lack oral healthcare education they may underrate the importance of oral care for good health outcomes.



Source: http://www.carolinayellow.com/nc-county-map.html

Social determinants of health are the conditions, in which people are born, grow, live, and work that shape the lives of each individual.[iii] Factors including socioeconomic status, transportation, education, and access to healthcare services influence how women receive oral care. These factors create conditions that leave rural women as well as pregnant individuals more at risk of adverse outcomes than their urban peers. Research suggests that poor oral health in

pregnant women can predispose their children to similar complications; thus, failure to address issues such as gum disease during pregnancy can subject future generations to experience those same oral health concerns.[iv] To address the disparities of dental care for future generations in rural Eastern North Carolina, it is necessary to educate pregnant women as well as obstetrics and gynecologist (OB/GYNs) about the challenges to oral health afflicting this particular population. Through early detection, monitoring, and assistance in finding cost-effective alternative methods for preventative oral care in the OB/GYN office, an office that many pregnant women visit regularly, women can then bypass the difficult system of Medicaid coverage for dental care and any additional transportation barriers to combat tooth decay and gum disease early on in pregnancy.

Background

The mouth is the beginning of the digestive system, and it ensures people can carry out necessary functions like eating and drinking. Untreated issues can inhibit language when a person's oral health begins to deteriorate. Therefore, good oral health is essential for individuals to have a quality of life that includes carrying out everyday functions and communicating with others around them. Oral health also may indicate the overall health in the body. For example, there is a heavy link between nutritional deficiency and oral infections to respiratory, digestive, and cardiovascular issues.[v] Heart disease, which is the number two killer of women in North Carolina, may first be detected through an oral health examination, which makes dental checkups an essential, and necessary part of care plans.[vi] However, because of issues regarding insurance, many North Carolina women experience difficulty receiving dental care.

Medicaid and Dental Coverage

Within the United States, public health insurance has experienced many challenges concerning dental care since the beginning of its formation.[vii] Restrictions within Medicaid make it difficult for people to qualify for dental coverage based on age, and further, leave people under-covered if they need added services in addition to basic oral checkups. In North Carolina, Medicaid dental benefits only cover "medically necessary" care which only includes routine checkups for adults and children."[viii] However, coverage for "experimental" care including full x-rays, complete and partial denture replacement take place only once every five years, 10 years, and 8 years respectively.[ix] This means women on Medicaid who may have oral health concerns outside of the scope of "medically necessary" treatments have to either pay out of pocket expenses or forfeit their comfort and health.

In the 2017- 2018 fiscal year, over 57.7% of total enrollees in Medicaid in North Carolina were women and girls.[x] The total unduplicated enrollments for Medicaid was 67,000 for Region 9.[xi] A total of 802 of these individuals enrolled were pregnant.[xii]

Because of the selective nature of Medicaid and the low return on investment for providers, access to dentists who accept Medicaid in North Carolina is limited. Rural Eastern communities experience more drastic disparities in access to providers than their urban counterparts located in such places as Raleigh, Greensboro, Charlotte, etc. This is because this area is home to both many low-income residents and is low-resourced. Its appeal to dental providers is minimal, leaving these communities in dire need of dentists to meet the oral healthcare needs of its residents.[xiii]

Oral Health Education

Additionally, disparities in tobacco use in rural North Carolina predispose residents there to higher rates of gum disease, other oral health issues, and cancers.[xiv] They lack education in

understanding the negative effect of tobacco on dental health.[xv] Together the lack of Medicaid dental insurance coverage and increased smoking, leave women in rural Eastern North Carolina more susceptible to oral health problems. Furthermore, the absence of oral health education and public health reform initiatives to improve the quality of life for pregnant women in the region continues to leave the population at risk of negative oral and other health outcomes.

Pregnancy and Oral Health

During pregnancy, some women develop a condition known as Pregnancy Gingivitis. Due to changes in hormones like progesterone, blood flow may start to increase within the gums and cause swelling, irritation, and bleeding.[xvi] The inflammation that begins to take place may indicate beginning signs of gingivitis, an early stage of periodontal disease. Hormone levels may also inhibit normal bodily responses to bacteria in the mouth and lead to increased plaque buildup. If not detected early on and treated, Pregnancy Gingivitis can lead to serious infection, dental caries (more commonly known as cavities), and potential tooth loss.[xvii] Additionally, the caries causing bacteria may transmit through the body and to a growing fetus.[xviii] Therefore, children of a woman with caries may be at risk for early childhood cavities, creating a never-ending cycle of bad oral health within families. According to the CDC, around 60-75% of all pregnant women in the United States have gingivitis.[xix]

The NC Department of Health and Human Services estimates that 20% of pregnant women living in Region 9 experience tooth decay.[xx] For pregnant women living in rural Eastern North Carolina, it can be a challenging to understand the importance of detection, diagnosis, and treatment of oral health issues. Because of the expense to fill cavities, women may not see their oral health pains as a priority when they have to take care of other financially burdensome activities, like preparing for a child. However, it is especially important for pregnant women to

understand how much their oral health affects the future of their child's health as well as their wellbeing.

In 2016, the North Carolina State Center for Health Statistics estimated that 31.2% of all women living in rural N.C. had 1-5 permanent teeth removed because of tooth decay or gum disease, 16.4% had lost more than 6 teeth, and 7.7% had lost all of their teeth.[xxi] Additionally, those women making less than $15,000 a year were more likely to have at least one tooth removed due to tooth decay or gum disease.[xxii] This data demonstrates that women of low income and in rural North Carolina experience alarming rates of oral health issues.

Table 1. Common Oral Health Conditions During Pregnancy

Pregnancy gingivitis	An increased inflammatory response to dental plaque during pregnancy causes the gingivae to swell and bleed more easily in most women. Rinsing with saltwater (ie, 1 teaspoon of salt in 1 cup of warm water) may help with the irritation. Pregnancy gingivitis typically peaks during the third trimester. Women who have gingivitis before pregnancy are more prone to exacerbation during pregnancy.
Benign oral gingival lesions (known as pyogenic granuloma, granuloma gravidarum or epulis of pregnancy)	In approximately 5% of pregnancies, a highly vascularized, hyperplastic, and often pedunculated lesion up to 2 cm in diameter may appear, usually on the anterior gingiva. These lesions may result from a heightened inflammatory response to oral pathogens and usually regress after pregnancy. Excision is rarely necessary but may be needed if there is severe pain, bleeding, or interference with mastication.
Tooth mobility	Ligaments and bone that support the teeth may temporarily loosen during pregnancy, which results in increased tooth mobility. There is normally not any tooth loss unless other complications are present.
Tooth erosion	Erosion of tooth enamel may be more common because of increased exposure to gastric acid from vomiting secondary to morning sickness, hyperemesis gravidarum, or gastric reflux during late pregnancy. Rinsing with a baking soda solution (ie, a teaspoon of baking soda dissolved in a cup of water) may help neutralize the associated acid.
Dental caries	Pregnancy may result in dental caries due to the increased acidity in the mouth, greater intake of sugary snacks and drinks secondary to pregnancy cravings, and decreased attention to prenatal oral health maintenance.
Periodontitis	Untreated gingivitis can progress to periodontitis, an inflammatory response in which a film of bacteria, known as plaque, adheres to teeth and releases bacterial toxins that create pockets of destructive infection in the gums and bones. The teeth may loosen, bone may be lost, and a bacteremia may result.

Data from Silk H, Douglass AB, Douglass JM, Silk L. Oral health during pregnancy. Am Fam Physician 2008;77:1139–44; Pirie M, Cooke I, Linden G, Irwin C. Dental manifestations of pregnancy. The Obstetrician & Gynaecologist 2007;9:21–6; Boggess KA. Maternal oral health in pregnancy. Society for Maternal-Fetal Medicine. Obstet Gynecol 2008;111:976–86; *and* Polyzos NP, Polyzos IP, Zavos A, Valachis A, Mauri D, Papanikolaou EG, et al. Obstetric outcomes after treatment of periodontal disease during pregnancy: systematic review and meta-analysis. BMJ 2010;341:c7017.

Methodology

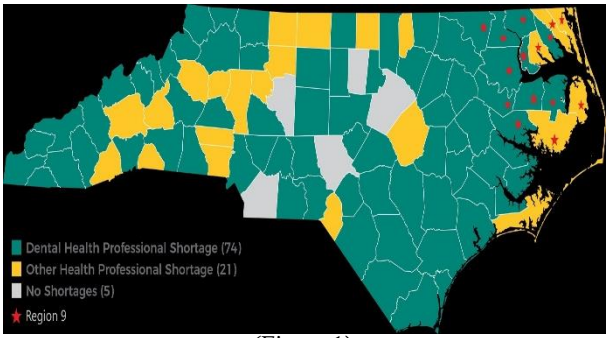
To understand how social determinates affect women's access to dental care in rural Eastern North Carolina, a literature review compiling information on Medicaid and non-Medicaid dental offices in Region 9 was preformed to understand how both transportation and distance, limited a patients' ability to see a dentist located further than a 15-minute drive from their home. The data and mapping were examined from primary sources such as the American Dental Association and Health Policy Institute. Additionally, information on the number of accessible dentists in Region 9 was examined and demonstrated an abnormally high provider to patient ratio. Rural Eastern North Carolina needs more dentists who adequately care for the population.

Not only is transportation, distance, and number of dentist problematic for residents of rural Eastern North Carolina, other social determinants such as gender, socioeconomic status, and environmental factors influence the care of women. Disparities in environmental resources such as public fluoridated water supply were analyzed to understand how it contributes to poor oral health outcomes in Region 9. Secondary resources were also studied to understand how low oral health education rates among women, beginning in their K-12 education, resulted from the lack of Fluoride Mouth Rise Education Programs to inform the students of healthy behaviors.

Findings and Social Determinants of Oral Health

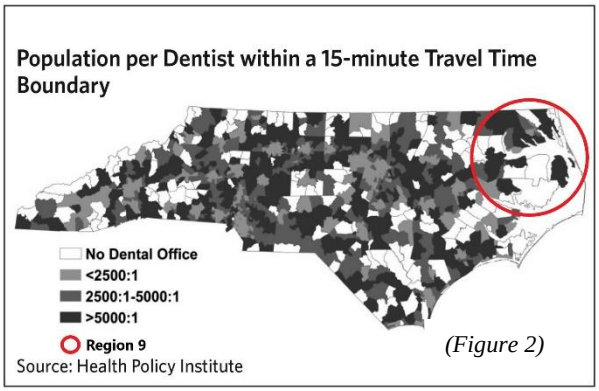
Access to Dental Services for Rural Patients

According to the John Locke Foundation, rural communities experience higher rates of gum disease and dental caries due to several infrastructural factors.[xxiii] Many patients in Region 9 North Carolina lack the professionals to provide dental and



(Figure 1)

Source: NC Department of Health and Human Services Office of Rural Health, "North Carolina Counties Designated Health Professional Shortage Areas SFY 2018"

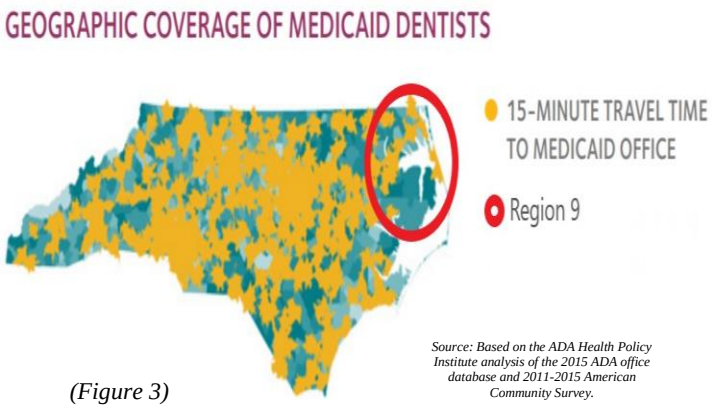


(Figure 2)

medical services. As seen in Figure 1, the majority of the Eastern counties experience high rates of dental provider shortages. According to the 2010 US Census data, North Carolina's rural population of about 3.2 million people ranked the state at number two for the highest total rural population in the country.[xxiv] The shortage of dentists in the area places a larger strain on those existing dental offices to service multiple towns and counties. Additionally, those dental clinics located in the area are often many miles away for patients and present transportation barriers for people seeking care (Figure 2). Eastern N.C. patients may also experience difficulties in affording care due to insurance hurdles.

Long Distance to Providers and Insurance Coverage

The availability of dental offices that accept Medicaid insurance coverage in rural Eastern North Carolina are few. While compared with other states, North Carolina patients who use Medicaid have more dental benefits available to them; however, trouble rests with finding dentists who accept Medicaid insurance. This leaves many individuals unable to seek out dental services.



(Figure 3)

Furthermore, when patients do find an office in a rural county that does accept Medicaid; the office may no longer be accepting new Medicaid-insured individuals or can be over 20 to 30 miles away from their home.[xxv] Those counties located in Region 9 tend to lack Medicaid dental offices within a 15-minute travel time as seen in

Figure 3. The distance may present transportation barriers that require patients to have access to motorized vehicles, which is dependent on an individual's socioeconomic status.

Oral Health Education and Fluoridation Prevention in Rural Eastern N.C.

Because women in rural N.C. often do not get regular dental checkups this leaves them unaware of their high risk of oral health problems. To understand how to care for their teeth individuals need access to a dentist. The dental office plays an important role in disseminating information about oral health and dental upkeep, without which, women in rural North Carolina are vulnerable to gum disease and tooth decay. Because access to dental offices that take Medicaid patients is limited or even nonexistent in parts of Eastern North Carolina, women living in these areas lack the means to receive proper health education and treatment options to address health concerns.

Fluoridated water effectively prevents cavities and can decrease the need for expensive dental treatments. However, water systems in rural Eastern North Carolina counties do not contain added fluoride. This significantly increases the risk of tooth decay in these populations. Within Region 9, only 17% of the population served by public water systems receive fluoridated water, leaving the majority of the people in these counties at higher risk for tooth decay.[xxvi]

Rural Eastern North Carolina also suffers from a lack of oral health education at earlier stages of life, demonstrated through the N.C. Fluoride Mouth Rinse Program. Fluoride Mouth Rinse Programs teach students through instruction, demonstration, and practice the proper procedure to rinse their mouths with a fluoride-based solution to prevent dental caries.[xxvii] Fluoride Mouth Rinse Programs take place within 7.7% of qualified Region 9 schools, leaving most students in the area vulnerable to increased rates of tooth decay.[xxviii] Without proper education, young women cannot be equipped with healthy dental habits early on and the number of cases of

dental related problems in the future is bound to increase with the next generation. With the lack of educational programs and environmental resources, the Region 9 population and its women are susceptible to early oral health problems.

Policy Recommendations

To decrease the alarming rates of tooth decay among pregnant women, I suggest a policy to implement a care plan that aids women in Region 9 who are at risk for tooth decay and gum disease. The goal is to begin early prevention and detection for women in their OB/GYN prenatal appointments. I hope to introduce a policy at these offices in rural counties to screen their patients for oral health issues and actively ask their patients about their oral health as a part of the prenatal exam. The goal is to educate OB/GYNs on minor oral health cues that may suggest larger oral concerns. Another objective is to have providers teach their patients in the offices about cost-effective treatments that could help lower their chances of tooth decay and gum disease. Women in rural Eastern North Carolina have more access to OB/GYNs through increased Medicaid services for prenatal care than access to dental care. Therefore, it is better to service women's oral health concerns in their OB/GYN office rather than hope for increases in numbers of dentists or better Medicaid policy and plans. This policy allows for a quick, low cost, and little disruption implementation to the existing medical establishment.

1. **Main Local Policy**: A Fluoride Mouth Rinse Program for pregnant women at their OB/GYN office in Region 9, Eastern North Carolina. Preferably an office that accepts Medicaid patients.

- When: At a woman's first prenatal visit, a nurse or doctor instructs, demonstrates, and guides a woman in practicing fluoride rinse.
    - Before the examination, patients should complete an oral health history on a questionnaire (see below "Follow-up").

    - During their first visit, the healthcare provider should explain what fluoride rinse is and what it does. The provider should teach pregnant women about the changes in their teeth and gums with a growing pregnancy. Pregnant patients should learn how they are susceptible to issues such as increased bacteria, plaque, and Pregnancy Gingivitis.
    - This is an educational opportunity to implement a new behavior early on in the pregnancy to prevent future dental issues and ensure women remain comfortable throughout pregnancy.
    - Send the patient home with pamphlets about oral health education (created by the NC Department of Health and Human Services).[xxix]
- Why this is necessary: Because the region's water supply lacks fluoride, women here are predisposed at higher levels to cavities and tooth decay. Fluoride is essential to help prevent cavities. Additionally, because there is a large disparity in the number of dental offices in the region it is necessary to reach the population at their OB/GYN offices to reduce transportation barriers. This also helps to educate the population about oral health.
- Follow-up: As a follow-up to the Fluoride Mouth Rinse Program, a healthcare facility should ask additional questions that include an oral health history on the patient information check-in sheet. These questions would ask patients about their oral health and allow the healthcare provider to know if they are having dental related issues.
    - Questions for the form:
        - "Do you have swollen or bleeding gums, a toothache (pain), problems eating or chewing food, or other problems in your mouth?" [xxx]
        - "Since becoming pregnant have you been vomiting? If so, how often?"[xxxi]

        - "Do you have any questions or concerns about your oral health care while you are pregnant?"[xxxii]
        - "When was your last dental visit? Do you need help finding a dentist?"[xxxiii]
        - Have you been effectively using a Fluoride Mouth Rinse? Do you need help with this?
    - If a patient has written a concerning note on the form:
        - A healthcare provider should ask additional questions when performing their prenatal examination and may include a minimal oral exam to detect any odd odors or other alarming sights.
            - Make updates to a woman's medical record for future reference.
        - If concerned: the healthcare provider may advise and refer patients out to a dentist. Additionally, the provider might make cost effective suggestions to help patients if they are unable to or cannot afford a visit to the dentist.
            - When referring a patient to a dentist, the doctor's office can commit to helping patients find an office that accommodates their insurance.

Note: There is a Fluoride Rinse guide created by Montana's Department of Public Health and Human Services that OB/GYN offices can use to educate and train professionals in Region 9 North Carolina. There are additional guides for public use from the Health Resources and Services Administration Maternal and Child Health Bureau and the NC Department of Health and Human Services to educate professionals and patients on oral health during pregnancy (located in references).

2. **Other Local Policies:**

- Conduct educational programming and training for women and medical professionals (OB/GYNs) in Region 9 to become knowledgeable about oral health and pregnancy.
- Establish partnerships with OB/GYN providers and dentists to better care for Medicaid patients in Region 9.

- Create and increase incentives for dental students (from The University of North Carolina at Chapel Hill's Adams School of Dentistry and East Carolina University School of Dental Medicine) to work in Region 9 with Medicaid adult patients after graduation for loan forgiveness or during school for training facilities.
    - Goal: To decrease the disparities between the number of dentists in rural Eastern North Carolina from their urban counterparts.

3. **State Policy:**

- Increase Fluoridated water supply to Region 9.
    - Goal: To prevent cavities among Region 9 inhabitants
- Expand Medicaid to include increased oral health care benefits.
- Advocate for the addition of oral health to the NC Department of Health and Human Services Prenatal Strategic Plan for 2021-2025.[xxxiv]

Conclusion

Fluoride Mouth Rinse Programs are typically school programs; however, because Region 9 has a limited amount of schools that utilize the program, those women who have come through the public school system lack basic oral health education. I believe this program can translate into a prenatal health program due to its flexibility and its low cost. This resource is necessary to help combat barriers to dental care including access to facilities, providers, and transportation. Implementing a Fluoride Mouth Rinse Program encourages women to continue practicing healthy habits throughout pregnancy and afterward. These behaviors will pass on to their children to ensure good oral hygiene within rural Eastern North Carolina.

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