NC Child

Tooth Dismay: a NEW LOOK at the DATA on CHILDREN'S ORAL HEALTH in NORTH CAROLINA

Newly available data from NC DHHS about children & pregnant adults enrolled in the state's Medicaid program uncover the increased barriers to oral health care faced by people of color and people in rural parts of the state.

NC Child
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Did you Know?

Tooth decay is the leading chronic disease of childhood.

Although dental caries (also called cavities) are largely preventable, they remain the most common chronic disease of children aged 6 to 11 years and adolescents aged 12 to 19 years.

Tooth decay is four times more common than asthma among adolescents aged 14 to 17 years.

Source: US Centers for Disease Control & Prevention (CDC)

Everyone should have the opportunity to lead a healthy life. Preventive care for physical and mental health is a key component of health – and that includes oral health. Unfortunately, for many families across North Carolina, dental health care is just a fantasy. In 2020, 98% of North Carolina counties were designated as "Dental Health Professional Shortage Areas," according to data released by Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (DHHS).

Until now, it has been difficult to track and evaluate the specific problems that North Carolinians face with respect to their oral health, due to lack of data. However, in 2020 the NC Division of Health Benefits made comprehensive data available for analysis. For the first time, these data are broken down by race, ethnicity, geography, and other demographic factors. This report presents those data in full in the appendices on pages 10-15. While comprehensive statewide data do not exist for many populations, we do have access to data covering children and pregnant individuals enrolled in Medicaid and NC Health Choice (CHIP) – representing about half of all children and pregnant people in the state.

New Indicators Point to North Carolina's Oral Health Challenges

NC Child's analysis of these new data found some striking indicators for the state's oral health:

- **Very few pregnant people enrolled in Medicaid are using the dental health benefit.** This is troubling because oral health during and after pregnancy can have significant impacts on young children's health.
- **Children in rural, eastern counties are much less likely to get the dental health care they need than children in other parts of the state.**
- **Among children enrolled in Medicaid, there are significant differences by race and ethnicity in who gets access to dental health care.** Two-thirds of white children enrolled in Medicaid received at least one oral health service in 2019, compared to just over half of Black and American Indian children, for example.
- **The increasing rate of children's hospital emergency department visits for dental health problems signals a growing gap in preventive care.**

Families Face a Variety of Barriers to Care

These data points underscore how significant the barriers are that keep children and families across the state from getting oral health care. Children with special health care needs, who often need more specialized oral health care, face even greater struggles.

While access to oral health services is already difficult for many families, COVID-19 has compounded barriers, making it even harder for many people to get the care they need. Closing dentist practices, fear of in-person visits due to high transmission potential of COVID-19, and school closures all created new obstacles.

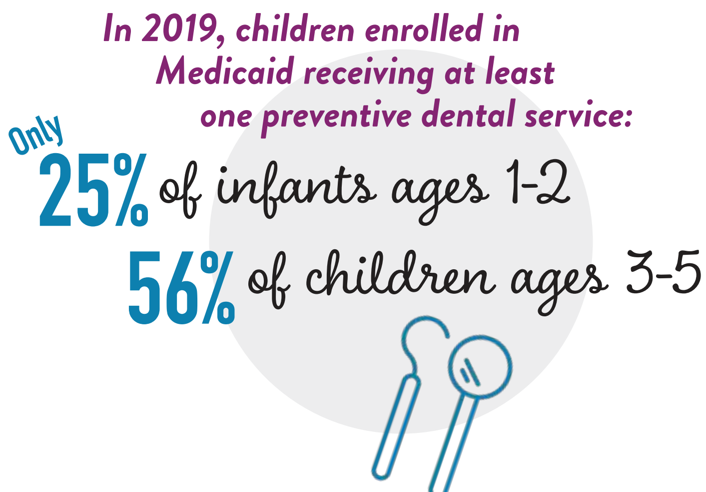
One final and crucial barrier for the Medicaid populations is that dental health is currently carved out of Medicaid managed care. This means that in order to meet their physical, behavioral, and oral health needs, families are required to navigate separate insurance programs. When care is split across multiple systems, that limits patients' ability to access and use the services.

Solutions & Recommendations

Low use of the Medicaid for Pregnant Women program's dental benefit and disparities in children's access to oral health care across race, ethnicity, and geography present systemic challenges. The authors present solutions and policy recommendations on page 7. Adopting a more holistic approach to children's health can help ensure that North Carolina's children do not lose developmental ground due to preventable dental health problems. The state's policy makers can do more to ensure that care coordination and care management include a stronger focus on oral health.

Explore Dynamic Data Online

This report examines the trends above in more detail. Readers can explore the data in the appendices, or through the interactive data dashboard on our website at ***ncchild.org/oralhealth***.



Oral Health

as an Essential Part of Prenatal and Postpartum Care

Oral health care is important throughout pregnancy, as pregnant individuals may be more prone to gum disease and cavities. For many pregnant individuals who get oral health care through Medicaid for Pregnant Women (also known as the Baby Love Program in North Carolina), pregnancy is the first time they ever have a dentist visit. Failing to ensure that people get oral health care during pregnancy is a missed opportunity to treat and prevent potentially threatening oral health disease, dispel patient fears and misconceptions about dental care, and to build a foundation for oral health for both mother and baby going forward.

Consistent Under-Use of Medicaid Dental Benefit for Pregnant Individuals

Long before the pandemic began, the Medicaid dental benefit for pregnant individuals was already severely under-used. This signals the need for improved access and patient education. In 2019, a mere 7 percent of pregnant individuals enrolled in the program received one or more dental service, a figure that has remained largely the same since 2017 (See Appendix B).

In 2020, the first year of the pandemic, the data show a significant drop in use of the dental benefit across racial groups, with Black (6.5%) and American Indian (6.7%) pregnant individuals slightly more likely to receive one or more dental services compared to white (5.3%), Asian (5%), and Hispanic/Latino (3%) pregnant individuals (See Appendix A). Research on maternal and infant health has found that people of color are more likely to encounter barriers in receiving health care including accessing care, navigating systems and receiving culturally-attuned care.[1] This remains true for oral health care, and work is needed to improve access across racial and ethnic groups.

Across the state, in 67 out of the 73 counties for which data were available, fewer than 10% of pregnant individuals received one or more dental service under the program in 2019. Rates were lowest in Surry, Moore, Henderson, Lenoir, and Hoke Counties, where approximately 3 to 4% of pregnant Medicaid beneficiaries received at least one dental service.

only **7%** of Pregnant People ***enrolled in Medicaid used their dental care benefit in 2019.***

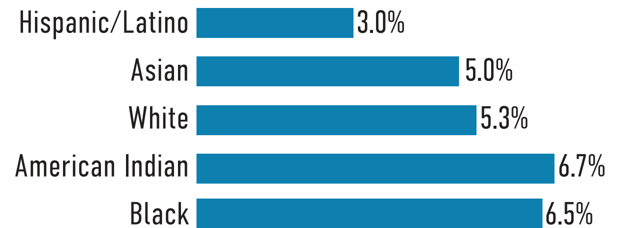
Barriers to Dental Care During & After Pregnancy

This low rate of utilization may have a variety of contributing factors. While some people may be familiar and comfortable with oral health care, many others are anxious about dental care – particularly during pregnancy.[2] Patient education about oral health care management during pregnancy is key. In addition to personal
reservations, patients often face external barriers such as a shortage of providers in their area. Some may have difficulty finding a dentist who accepts Medicaid and is willing to treat during pregnancy.

Unfortunately in North Carolina, currently the window to access Medicaid oral health benefits during pregnancy is arbitrarily cut short at birth—leaving birthing parents without the necessary follow-up and treatments during the postpartum period. This is just one of the reasons that NC Child, along with many health organizations, support extending post-partum Medicaid coverage from 60 days to 12 months after the birth of a child (as of this writing, legislation to extend Medicaid postpartum was still pending in North Carolina).

Racial & Ethnic Disparities in Care During Pregnancy

Black and American Indian people were more likely to use Medicaid for Pregnant Women's Dental Benefit than white, Asian, and Hispanic/Latino people in 2020.



Solutions for Ensuring Long-Term Family Dental Health

Ensuring coverage through the prenatal and postpartum periods is a strong first step. However time-limited solutions fall short of the necessary care and treatment that sets families up for good long-term health. Policies like Medicaid expansion that provide continuous coverage can ensure that parents have access to oral health services from pre-conception through early childhood.

Access to adult dental benefits through Medicaid has been shown to increase the use of dental care among parents, while also increasing care coordination and referrals. In turn, access to dental coverage for parents is associated with an increase in dental visits for children.[3] This "spillover" effect means that both parent and infant are more likely to get the services and treatments they need and move towards preventive care aimed at establishing healthy practices across the lifespan.

Healthy Teeth, Healthy Children

The American Dental Association (ADA) and the American Academy of Pediatrics (AAP) recommend that children should receive their first dental visit within six months of their first tooth, or no later than 12 months of age. Early childhood is a critical period for establishing a dental home and lifelong oral health. Early dental care can also reduce care costs throughout childhood.

In early childhood, dental problems can interrupt developmentally crucial processes including communication and socialization. Additionally, dental disease in childhood can lead to lost sleep, poor growth, behavioral problems, and poor learning.[4] Research shows that early dental visits are effective for protecting children's long-term dental health, and they reduce costs of subsequent visits for families.[5] Prevention is key, and it begins early in life.

Contributing Factors to Children's Under-Use of Dental Care

Even when families have insurance coverage for oral health care, that doesn't necessarily mean there is a local dentist who will serve their needs. Across the state, many parents and caregivers struggle to find dentists that will care for kids on Medicaid. Moreover, it can be extremely difficult to find dentists who are comfortable treating young children, children with special health care needs, or English language learners.

Unfortunately, the data show that preventive oral health and dental services are very under-used among young children enrolled in Medicaid. In 2019, the latest year for which data are available, just one in four infants ages 1 to 2 enrolled in Medicaid received at least one preventive dental service, while a little over half (56%) of children ages 3 to 5 received at least one preventive dental service (see Appendix C).

Disparities in the Use of Oral and Dental Health Care

There are significant differences in the use of oral health or dental service across race and ethnicity. As of 2019, Hispanic/Latino (74.1%), White (62.9%) and Asian (63.5%) children enrolled in Medicaid were more likely to receive at least one oral health or dental service compared to Black (55.6%), American Indian (53%) and Hawaiian or Pacific Islander (54.7%) children (See Appendix D).

Place also matters when it comes to oral and dental health care. Families who live in more rural counties have a harder time finding dental health providers compared to families in urban or suburban areas. In 2019, children enrolled in Medicaid were least likely to have received at least one oral health or dental service in eight eastern rural NC counties: Camden, Washington, Gates, Vance, Tyrell, Edgecombe, Chowan, Onslow. Cherokee and Swain counties in the mountains round out the bottom ten counties for children's access to dental health care in North Carolina (See Appendix F).

Racial & Ethnic Disparities in Children's Care

Hispanic/Latino, white and Asian children enrolled in Medicaid more likely to receive at least one oral health or dental service compared to Black, American Indian and Hawaiian or Pacific Islander children were in 2019.

Strategies to Remove Barriers to Children's Preventive Care

Sealants

Dental caries, or tooth decay, is the most common chronic disease experienced in childhood, four times more prevalent than asthma.[6] Dental caries can have lasting impacts on a child's overall health.[7] The good news is that we can prevent tooth decay among children before it starts.
Dental sealants are a low cost, evidence-based strategy to prevent tooth decay and protect children against cavities.

Sealants provide a protective barrier on children's teeth for the purpose of sealing out food and bacteria that can result in cavities. According to the American Academy of Pediatric Dentistry (AAPD), sealant placement in children and adolescents has shown a reduction of cavities' incidence by 86 percent after one year.[8] Children without sealants experience three times as many cavities as those who have sealants.[9]

Despite the effectiveness of dental sealants, 60 percent of school-age children nationwide fail to receive treatment each year.[10] Children without sealants experience three times as many cavities as those who have sealants.[11] Children often can't take advantage of such highly-effective preventive treatments.

Strategies that can remove barriers for children include:

- Locating oral health services in spaces children frequent, such as schools; and
- Expanding the types of providers that can provide preventive care like sealants.

Fluoride varnish

Fluoride varnish is a dental treatment that can help prevent tooth decay, slow it down, or stop it from getting worse. Over the years, North Carolina's Into the Mouth of Babes program has proven to be an effective model for providing preventive care to our youngest children. Into the Mouths of Babes provides training for medical providers to deliver preventive oral health services, including the application of fluoride varnish, to young children insured by NC Medicaid.

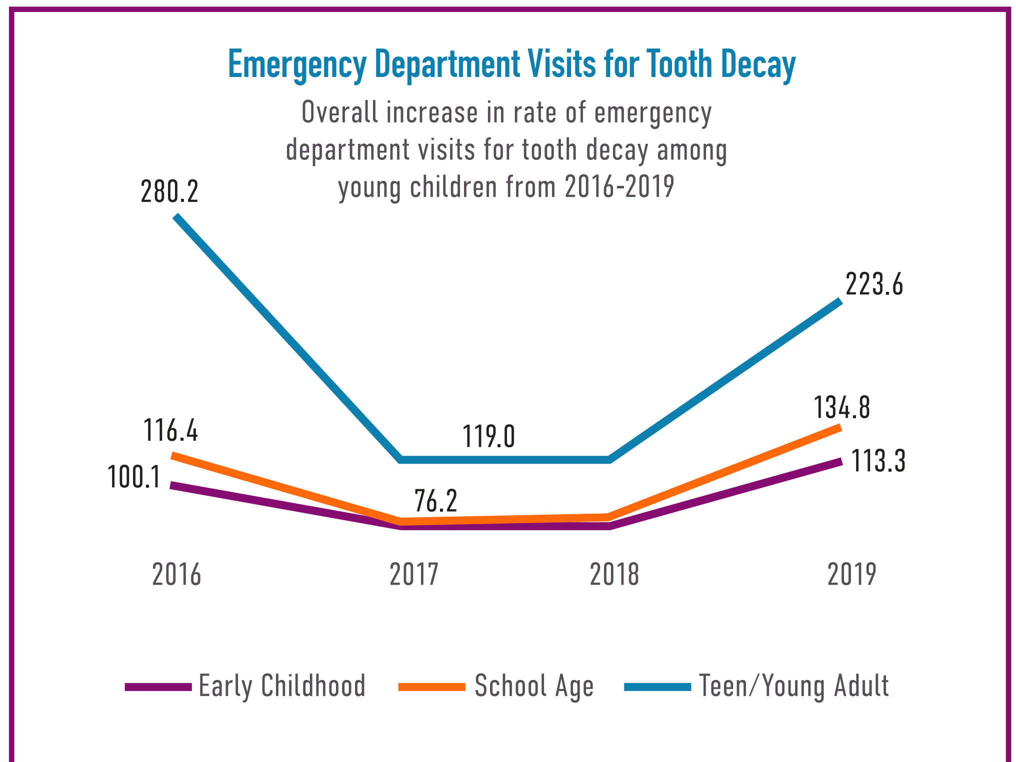
However, the Division of Health Benefits has never made data publicly available about how many children receive this highly effective service. As the state transitions to Medicaid managed care, it will be important to track utilization data and make it available to help providers understand and address gaps and issues of access.

Emergency Treatment for Preventable Dental Disease

When kids don't have meaningful access to care, they can end up in hospital emergency rooms for treatment of otherwise preventable issues like caries. Emergency treatment is an expensive temporary solution that often only addresses children's presenting symptoms rather than root causes. In addition, uncompensated care increases the financial burden borne by both hospitals and taxpayers. Emergency treatment is not a sustainable alternative to dental homes.

Data on children enrolled in Medicaid and NC Health Choice who receive emergency treatment at a hospital for untreated tooth decay suggest a growing shortage of preventive oral health care. From 2016 to 2019, the annual rate of early childhood and school age children enrolled in Medicaid who received emergency treatment for dental caries saw an overall increase (See Appendix H).

Importantly, these are emergency visits that did not result in inpatient admission – signaling that patients are showing up in the emergency department because they do not have access to a dentist who can provide regular care. Emergency care at hospitals is an expensive, painful, and preventable outcome when children and families can't get the preventive treatments they need.



Policy Recommendations

COVID-19 has exposed many holes in North Carolina's health care delivery system, and oral health care is no exception. The communities who have been hit hardest by the economic impacts of the pandemic are also most likely to struggle with access to vital testing, treatment, and care. This builds on pre-existing inequities in access to dental and oral health services for children and pregnant individuals. Communities of color are often disproportionately impacted because of deeply-embedded systemic racism, and economic barriers to the health care we all need.[12]

By addressing the points where the system is failing, we can benefit all of North Carolina's children and families in the long term. ***The following recommendations can help strengthen North Carolina's delivery of vital oral health and dental care services for children and families:***

1. **Expand NC Medicaid.** State legislators can accept the federal funding available to expand NC Medicaid coverage to more low-income North Carolinians, ensuring parents' access to oral health services from pre-conception through early childhood. Expanding Medicaid coverage provides more people with the health services and supports they need. It can improve long-term health through care coordination and referrals to additional services. Better-coordinated care supports sustainable healthy habits that foster well-being for children and parents.[13] Research has shown that when parents have access to health care, including oral health, they are more likely to seek care for their children regardless of insurance status.[14]

2. **Boost access to effective prevention programs like Into the Mouth of Babes.** State legislators can appropriate additional funding to grow these high-impact programs, delivering cost-saving preventive services to families of young children.

   2.1 **Track and Make Publicly Available Annual Rates of Preventive Services.** NC Division of Health Benefits can support increased access by regularly publishing rates of use by geography, race, and age for preventive programs like Into the Mouth of Babes. This would allow researchers, and community members to better identify the most effective strategies to increase access to care.

   2.2 **Co-locating Preventative Oral Health Care.** The CDC recommends school-based sealant programs (SBSPs) to prevent dental caries among children and protect children at risk for poor oral health.[15] State & local officials and care providers can pursue strategies to locate these programs within schools, early childhood programs, and other community locations frequented by children. These programs can reduce disparities in access, and link children to dental homes in their community for more extensive treatment needs. children to dental homes in their community for more extensive treatment needs.

3. **Expand the use of teledentistry to remove barriers to access.** Patients can consult with a dentist through video or phone to determine what their options are to solve oral health issues and make decisions about treatment. The use of teledentistry can open up access in rural, under-served areas of the state. There are two important policy changes that state legislators can pursue to make teledentistry a more viable solution:

   3.1 **Improve access to broadband.** Currently, access to reliable broadband and technology remains limited in our most rural areas. In addition, many low-income families find broadband too costly, even where it is widely available. While state legislators continue to support increased broadband infrastructure, North Carolina will need continued investments to ensure that families can connect to affordable, reliable broadband service.

   3.2 **Make teledentistry reimbursement permanent.** Additionally, public and private insurers will need to make reimbursement for teledentistry permanent to ensure this new avenue to increased access remains after the COVID-19 public health emergency ends.

4. **Building in more workforce flexibility in North Carolina's Dental Practice Act.** State legislators could use this tool to enable dental hygienists to operate at the top of their training, increasing access to services for children across the state.

State leaders can take advantage of several new pathways to remake the oral health system to better serve North Carolina. Armed with these new data, we should pursue opportunities surfaced by both the pandemic and the transition to Medicaid managed care. These include making permanent some of the flexibilities in service provisions allowed during the pandemic, as well as the opportunities to better coordinate care. These strategies can help break down long-established barriers to oral health care.

Every child deserves the opportunity to grow up healthy and thrive. Oral health is a vital component of children's lifelong health and well-being.

Acknowledgments

Thank you to the Oral Health Section of the NC Division of Public Health (NC DHHS) for providing the data used throughout this report.

Glossary

Dental Health Services, and Oral Health Services – Both of these terms refer to medical care and hygiene services related to the teeth and mouth.

Dental Caries – Dental caries or cavities, also known as tooth decay, are caused by a breakdown of the tooth enamel. Tooth decay can be very painful and disruptive to child development. Caries are highly preventable, and are the most common chronic disease of childhood.

Dental Sealant - Sealants are a thin, protective coating made from plastic or other dental materials. Sealants adhere to the chewing surface of your back teeth. Together with flossing, brushing, and regular cleanings by an oral health professional, sealants can be highly effective at preventing tooth decay.

Flouride Varnish - Fluoride varnish is a dental treatment that can help prevent tooth decay, slow it down, or stop it from getting worse. Flouride varnish treatments consist of a highly-concentrated form of fluoride, which can be applied to the tooth's surface by a dental hygienist.

NC Health Choice – The North Carolina Health Choice (NCHC) Health Insurance Program for Children, also known as CHIP, is a comprehensive health coverage program for low-income children.

Into the Mouth of Babes – The Into the Mouth of Babes Program trains medical providers to deliver preventive oral health services to young children insured by NC Medicaid. Services are provided from the time of tooth eruption until age three and a half (42 months), including oral evaluation and risk assessment, parent/caregiver counseling, fluoride varnish application, and referral to a dental home.

Medicaid – Medicaid is a health insurance program for low-income individuals and families who cannot afford health care costs. Medicaid covers dental services for all children enrollees as part of a comprehensive set of benefits, referred to as the Early and Periodic Screening, Diagnostic and Treatment (EPSDT) benefit.

Pregnant Medicaid Individuals or Beneficiaries – Refers to people enrolled in the Medicaid for Pregnant Women program, also called Baby Love. The report authors understand that pregnant and birthing individuals may identify outside the cisgender binary.

Teledentistry - Teledentistry refers to the use of telehealth systems in dentistry. Telehealth includes technologies and tactics used to deliver virtual medical, health, and education services. Telehealth is not a specific service, but a collection of means to enhance care and education delivery.

Footnotes

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15. Centers for Disease Control and Prevention, “Dental Sealants,” Jul. 2021.

Appendix

Appendix A: Pregnant Medicaid Beneficiaries Utilization of One or More Dental Service by Race and Ethnicity (2016-2019)

Race/Ethnicity	2016	2017	2018	2019	2020
	Percent	Percent	Percent	Percent	Percent
American Indian	7.9%	10.2%	9.4%	6.5%	6.7%
Asian	7.8%	9.2%	8.5%	7.3%	5.0%
Black	10.0%	10.7%	9.0%	8.0%	6.5%
Hawaiian or Pacific Islander	NA	NA	NA	NA	NA
White	7.3%	7.7%	7.2%	6.3%	5.3%
Hispanic/Latino	2.9%	3.5%	3.5%	3.7%	3.0%
Total	**8.0%**	**8.6%**	**7.8%**	**6.8%**	**5.7%**

Source: NC Department of Health and Human Services, Division of Public Health. Oral Health Section.

Appendix B: Pregnant Medicaid Beneficiaries Utilization of One or More Dental Service by County (2017-2019)

County	Percentage of Beneficiaries Receiving at Least One Dental Service		
	2017	2018	2019
Alamance	5.9%	5.8%	6.6%
Alexander	8.3%	6.4%	6.2%
Alleghany	NA	NA	NA
Anson	10.5 %	5.7%	12.1%
Ashe	NA	NA	9.7%
Avery	NA	NA	NA
Beaufort	5.8%	4.8%	6.2%
Bertie	NA	NA	NA
Bladen	5.1%	5.2%	3.9%
Brunswick	4.2%	4.8%	5.3%
Buncombe	9.3%	8.5%	9.3%
Burke	7.6%	4.3%	6.1%
Cabarrus	7.4%	7.3%	7.7%
Caldwell	5.4%	7.5%	12.4%
Camden	NA	NA	NA
Carteret	8.5%	10.4 %	12.2%
Caswell	7.3%	6.0%	9.9%
Catawba	9.0%	11.0 %	9.1%
Chatham	5.8%	5.8%	5.2%
Cherokee	14.2 %	7.9%	6.6%
Chowan	NA	NA	NA
Clay	20.0 %	15.9 %	18.8%
Cleveland	15.5 %	12.2 %	9.2%

County	Percentage of Beneficiaries Receiving at Least One Dental Service		
	2017	2018	2019
Columbus	3.0%	5.4%	4.0%
Craven	9.5%	9.0%	10.4%
Cumberland	7.3%	5.7%	5.6%
Currituck	NA	NA	NA
Dare	4.5%	NA	3.8%
Davidson	6.4%	6.2%	6.5%
Davie	NA	4.3%	4.8%
Duplin	6.5%	6.3%	5.1%
Durham	4.8%	4.1%	5.3%
Edgecombe	4.8%	6.6%	6.4%
Forsyth	4.4%	4.1%	4.0%
Franklin	6.6%	4.9%	6.3%
Gaston	9.2%	7.3%	10.6%
Gates	NA	NA	NA
Graham	NA	NA	NA
Granville	7.4%	5.7%	4.8%
Greene	NA	NA	8.4%
Guilford	5.9%	5.4%	5.3%
Halifax	8.4%	6.2%	6.3%
Harnett	6.1%	6.8%	4.3%
Haywood	6.6%	6.5%	5.9%
Henderson	5.3%	3.6%	3.6%
Hertford	NA	NA	NA
Hoke	4.2%	5.0%	3.7%
Hyde	NA	NA	NA
Iredell	7.3%	7.0%	5.9%
Jackson	NA	NA	NA

County chart continues on next page.

Appendix B: Pregnant Medicaid Beneficiaries Utilization of One or More Dental Service by County (2017-2019) Continued

County	Percentage of Beneficiaries Receiving at Least One Dental Service		
	2017	2018	2019
Johnston	4.0%	3.5%	5.2%
Jones	NA	NA	NA
Lee	8.3%	3.8%	4.3%
Lenoir	9.6%	6.6%	3.6%
Lincoln	4.6%	4.7%	4.6%
Macon	5.8%	3.9%	4.4%
Madison	NA	9.8%	NA
Martin	NA	NA	7.5%
McDowell	8.7%	8.1%	8.2%
Mecklenburg	3.5%	4.1%	4.0%
Mitchell	NA	NA	NA
Montgomery	NA	6.4%	4.8%
Moore	5.0%	4.3%	3.6%
Nash	3.7%	3.4%	5.0%
New Hanover	5.3%	4.7%	5.6%
Northampton	NA	NA	NA
Onslow	8.0%	8.2%	7.3%
Orange	9.8%	9.7%	8.6%
Pamlico	NA	NA	NA
Pasquotank	NA	4.0%	NA
Pender	5.1%	7.9%	6.1%
Perquimans	NA	NA	NA
Person	5.7%	7.9%	5.6%
Pitt	4.6%	6.0%	7.6%
Polk	NA	NA	NA
Randolph	3.7%	3.7%	3.8%

County	Percentage of Beneficiaries Receiving at Least One Dental Service		
	2017	2018	2019
Richmond	2.9%	2.3%	4.1%
Robeson	4.7%	5.1%	4.9%
Rockingham	6.1%	6.0%	4.6%
Rowan	4.4%	4.8%	5.1%
Rutherford	8.0%	7.7%	9.6%
Sampson	4.3%	4.7%	4.4%
Scotland	5.9%	6.4%	4.7%
Stanly	5.0%	5.3%	5.0%
Stokes	10.2 %	5.0%	NA
Surry	4.0%	3.2%	3.0%
Swain	NA	NA	NA
Transylvania	NA	NA	NA
Tyrrell	NA	NA	NA
Union	7.9%	6.7%	5.0%
Vance	5.3%	6.4%	7.4%
Wake	6.6%	6.2%	6.6%
Warren	NA	7.1%	6.8%
Washington	NA	NA	NA
Watauga	6.6%	NA	NA
Wayne	5.0%	6.7%	5.3%
Wilkes	8.0%	6.2%	4.7%
Wilson	3.1%	5.2%	4.7%
Yadkin	4.3%	3.9%	NA
Yancey	NA	NA	NA
North Carolina	8.6%	7.8%	6.8%

Source: NC Department of Health and Human Services, Division of Public Health. Oral Health Section.

Appendix C: Preschool NC Medicaid Beneficiaries Utilization of a Preventive Dental Service (2011-2019)

Year	Percent of Children Ages 1-2 Receiving a Preventive Dental Service	Percent of Children Ages 3-5 Receiving a Preventive Dental Service
2011	19%	50%
2012	22%	53%
2013	23%	53%
2014	23%	52%
2015	23%	52%
2016	23%	54%
2017	24%	54%
2018	24%	54%
2019	25%	56%

Source: NC Department of Health and Human Services, Division of Public Health. Oral Health Section.

Appendix D: Medicaid Children Beneficiaries Utilization of Oral Health or Dental Services by Race and Ethnicity (2016-2019)

Race/Ethnicity	2016	2017	2018	2019
Asian	59.1%	60.6%	61.9%	63.5%
Black	54.1%	54.6%	54.4%	55.6%
American Indian	53.9%	52.9%	52.2%	53.0%
Hawaiian or Pacific Islander	55.7%	56.5%	54.7%	54.7%
White	60.9%	61.8%	61.7%	62.9%
Hispanic/Latino	73.0%	73.7%	73.4%	74.1%
Total	58.2%	58.9%	58.8%	59.9%

Source: NC Department of Health and Human Services, Division of Public Health. Oral Health Section.

Appendix E: Health Choice Children Beneficiaries Utilization of Oral Health or Dental Services by Race and Ethnicity (2016-2019)

Race/Ethnicity	2016	2017	2018	2019
Asian	61.0%	60.9%	61.6%	65.9%
Black	58.8%	57.8%	58.3%	60.2%
American Indian	54.6%	51.3%	50.6%	55.9%
Hawaiian or Pacific Islander	61.5%	63.2%	68.2%	75.0%
White	65.4%	66.4%	67.4%	68.8%
Hispanic/Latino	76.8%	77.0%	78.2%	79.2%
Total	63.4%	63.7%	64.4%	66.1%

Source: NC Department of Health and Human Services, Division of Public Health. Oral Health Section.

Appendix F: Medicaid Children Beneficiaries Utilization of Oral Health or Dental Services by County (2016-2019)

	Percentage of Beneficiaries Receiving at Least One Oral Health or Dental Service			
County	2016	2017	2018	2019
Alamance	64.2%	64.5%	64.6%	65.6%
Alexander	64.3%	64.7%	62.9%	65.7%
Alleghany	66.5%	66.1%	63.1%	62.5%
Anson	54.3%	55.7%	55.2%	56.7%
Ashe	59.2%	60.6%	56.0%	61.4%
Avery	55.9%	59.8%	60.3%	59.3%
Beaufort	50.8%	56.2%	59.1%	60.9%
Bertie	50.5%	51.3%	52.3%	51.3%
Bladen	58.7%	59.0%	57.2%	58.3%
Brunswick	53.8%	54.1%	54.3%	57.5%
Buncombe	61.0%	61.7%	62.3%	63.6%
Burke	59.6%	61.5%	63.6%	64.1%
Cabarrus	59.3%	62.0%	60.4%	62.5%
Caldwell	56.8%	57.5%	59.9%	60.2%
Camden	43.3%	51.4%	50.2%	46.5%
Carteret	54.5%	54.2%	55.1%	58.7%
Caswell	56.1%	56.0%	56.7%	56.5%
Catawba	65.1%	66.4%	64.9%	66.3%

	Percentage of Beneficiaries Receiving at Least One Oral Health or Dental Service			
County	2016	2017	2018	2019
Chatham	62.8%	65.8%	65.2%	65.9%
Cherokee	51.7%	51.1%	53.3%	50.5%
Chowan	43.0%	49.6%	51.7%	50.9%
Clay	51.1%	55.4%	60.1%	60.8%
Cleveland	57.6%	58.2%	56.4%	54.9%
Columbus	54.4%	56.3%	52.2%	51.5%
Craven	58.5%	56.0%	57.7%	60.2%
Cumberland	57.6%	57.4%	57.6%	58.6%
Currituck	57.6%	57.1%	59.5%	58.6%
Dare	62.3%	61.6%	58.6%	62.8%
Davidson	59.2%	59.9%	59.5%	60.2%
Davie	60.8%	63.5%	60.5%	61.6%
Duplin	62.6%	64.1%	64.0%	64.3%
Durham	62.3%	63.4%	63.9%	64.7%
Edgecombe	49.5%	49.6%	50.9%	50.7%
Forsyth	62.2%	61.9%	62.1%	63.4%
Franklin	55.1%	57.6%	58.1%	59.3%
Gaston	54.7%	56.1%	55.7%	57.8%
Gates	49.9%	49.8%	51.4%	48.8%

County chart continues on next page.

Appendix F: Medicaid Children Beneficiaries Utilization of Oral Health or Dental Services by County (2016-2019) ***Continued***

County	Percentage of Beneficiaries Receiving at Least One Oral Health or Dental Service			
	2016	2017	2018	2019
Gates	49.9%	49.8%	51.4%	48.8%
Graham	52.4%	53.4%	53.8%	55.6%
Granville	51.3%	51.9%	53.1%	56.9%
Greene	60.8%	59.7%	62.1%	62.9%
Guilford	59.5%	61.1%	61.2%	62.9%
Halifax	59.6%	59.0%	57.7%	58.0%
Harnett	61.8%	63.5%	62.3%	62.3%
Haywood	60.9%	59.4%	60.9%	63.8%
Henderson	61.0%	58.5%	59.6%	62.4%
Hertford	53.7%	53.3%	53.8%	53.3%
Hoke	58.2%	57.4%	56.6%	57.1%
Hyde	54.5%	57.3%	57.7%	65.0%
Iredell	60.0%	60.0%	58.6%	57.9%
Jackson	47.1%	48.8%	50.0%	51.3%
Johnston	60.3%	61.8%	64.0%	65.1%
Jones	57.8%	58.2%	58.1%	57.7%
Lee	66.8%	66.5%	64.8%	66.7%
Lenoir	55.6%	52.8%	53.8%	55.2%
Lincoln	56.5%	56.6%	55.6%	58.6%
Macon	56.3%	56.1%	59.1%	56.6%
Madison	57.8%	59.5%	59.6%	60.0%
Martin	57.1%	53.9%	54.9%	54.5%
McDowell	54.6%	56.1%	56.5%	55.6%
Mecklenburg	56.8%	58.7%	58.1%	59.5%
Mitchell	52.9%	56.1%	52.9%	52.7%
Montgomery	64.2%	63.7%	62.0%	63.1%
Moore	62.5%	61.3%	60.4%	62.1%
Nash	53.8%	53.8%	53.8%	56.0%
New Hanover	56.8%	59.0%	58.5%	60.8%
Northampton	52.5%	51.8%	52.7%	52.5%
Onslow	51.2%	51.6%	50.4%	50.9%
Orange	60.8%	61.9%	63.2%	66.1%
Pamlico	55.9%	61.8%	63.5%	63.8%
Pasquotank	50.4%	50.4%	52.7%	52.8%
Pender	59.0%	58.8%	59.1%	60.0%
Perquimans	51.4%	51.9%	54.8%	53.8%
Person	55.4%	56.8%	56.3%	57.6%

Source: NC Department of Health and Human Services, Division of Public Health. Oral Health Section.

County	Percentage of Beneficiaries Receiving at Least One Oral Health or Dental Service			
	2016	2017	2018	2019
Person	55.4%	56.8%	56.3%	57.6%
Pitt	50.0%	49.6%	51.9%	52.7%
Polk	60.6%	61.7%	52.3%	54.1%
Randolph	59.5%	61.5%	61.0%	62.7%
Richmond	53.0%	51.1%	51.0%	53.1%
Robeson	55.0%	55.0%	54.6%	55.3%
Rockingham	56.0%	56.2%	55.1%	56.8%
Rowan	59.4%	60.4%	59.3%	60.5%
Rutherford	58.9%	60.0%	58.8%	53.4%
Sampson	57.7%	62.8%	63.7%	65.6%
Scotland	61.4%	61.6%	60.8%	60.4%
Stanly	57.9%	56.3%	55.4%	56.8%
Stokes	59.9%	59.1%	61.2%	60.0%
Surry	64.7%	63.6%	62.8%	64.1%
Swain	31.4%	32.8%	33.3%	33.8%
Transylvania	54.3%	56.5%	57.0%	59.3%
Tyrrell	47.3%	56.0%	58.1%	50.6%
Union	62.8%	62.3%	62.6%	62.7%
Vance	47.0%	46.7%	48.2%	50.0%
Wake	60.0%	60.1%	60.2%	61.3%
Warren	54.1%	51.3%	52.7%	53.5%
Washington	52.7%	53.1%	53.2%	48.4%
Watauga	65.0%	64.9%	64.5%	63.7%
Wayne	57.7%	59.2%	59.9%	60.9%
Wilkes	66.0%	66.7%	65.6%	67.1%
Wilson	57.5%	58.3%	57.5%	58.5%
Yadkin	60.4%	61.8%	60.9%	64.6%
Yancey	53.1%	53.4%	52.9%	52.7%
North Carolina	58.2%	58.9%	58.8%	59.9%

Appendix G: Health Choice Children Beneficiaries Receiving Oral Health or Dental Services by County (2016-2019)

County	Percentage of Beneficiaries Receiving at Least One Oral Health or Dental Service			
	2016	2017	2018	2019
Alamance	71.2%	71.5%	72.1%	72.6%
Alexander	71.6%	74.3%	75.3%	72.0%
Alleghany	62.6%	67.2%	66.2%	74.2%
Anson	55.7%	62.2%	54.2%	64.5%
Ashe	62.3%	66.7%	58.6%	65.3%
Avery	62.6%	63.5%	59.2%	64.9%
Beaufort	53.5%	60.1%	63.8%	62.7%
Bertie	51.6%	48.1%	59.4%	50.2%
Bladen	69.4%	68.3%	63.3%	62.6%
Brunswick	56.7%	58.7%	63.2%	65.0%
Buncombe	66.3%	66.9%	69.8%	70.5%
Burke	59.9%	59.6%	64.0%	67.9%
Cabarrus	65.3%	66.4%	66.7%	70.8%
Caldwell	59.6%	56.7%	59.6%	65.6%
Camden	46.3%	37.3%	58.2%	41.6%
Carteret	53.6%	59.9%	58.7%	59.4%
Caswell	66.7%	64.9%	64.1%	63.4%
Catawba	72.1%	70.5%	72.8%	73.1%
Chatham	65.4%	74.0%	71.0%	69.1%
Cherokee	51.3%	56.9%	61.2%	67.4%
Chowan	45.5%	59.3%	56.9%	54.1%
Clay	58.9%	60.3%	68.1%	66.4%
Cleveland	66.9%	66.4%	63.9%	62.1%
Columbus	56.3%	58.1%	54.3%	52.5%
Craven	59.1%	57.5%	61.0%	60.4%
Cumberland	62.8%	63.1%	63.6%	63.8%
Currituck	57.1%	66.3%	65.5%	67.4%
Dare	63.7%	60.3%	63.7%	71.1%
Davidson	61.0%	60.5%	63.0%	64.8%
Davie	67.9%	65.9%	62.8%	63.0%
Duplin	72.1%	75.2%	71.4%	73.9%
Durham	67.8%	65.7%	66.9%	67.8%
Edgecombe	56.5%	55.2%	57.5%	59.0%
Forsyth	62.4%	63.6%	65.4%	66.7%
Franklin	62.2%	68.45%	70.1%	69.8%
Gaston	63.3%	60.2%	59.7%	63.0%
Gates	57.0%	61.5%	68.1%	55.9%
Graham	74.3%	73.8%	54.6%	62.1%
Granville	64.1%	60.3%	62.8%	63.3%
Greene	57.6%	57.6%	63.1%	57.3%
Guilford	60.2%	59.0%	60.2%	63.1%
Halifax	64.5%	65.7%	62.0%	60.7%
Harnett	69.4%	69.5%	69.6%	68.4%
Haywood	65.7%	64.5%	62.0%	66.7%
Henderson	59.7%	60.1%	62.0%	63.4%

County	Percentage of Beneficiaries Receiving at Least One Oral Health or Dental Service			
	2016	2017	2018	2019
Hertford	61.1%	62.3%	56.4%	57.5%
Hoke	59.2%	55.4%	57.6%	63.1%
Hyde	51.8%	60.0%	64.1%	63.5%
Iredell	64.2%	67.8%	67.0%	65.8%
Jackson	54.7%	51.1%	56.3%	59.1%
Johnston	66.6%	68.4%	70.5%	71.9%
Jones	55.1%	48.5%	54.6%	66.1%
Lee	73.8%	71.2%	71.6%	73.3%
Lenoir	59.0%	59.9%	59.2%	61.3%
Lincoln	59.5%	60.8%	65.8%	68.8%
Macon	56.2%	59.1%	60.5%	50.5%
Madison	53.5%	61.3%	63.8%	67.9%
Martin	56.9%	63.7%	58.5%	61.1%
McDowell	64.6%	63.4%	63.0%	61.8%
Mecklenburg	63.5%	63.1%	63.8%	66.4%
Mitchell	51.2%	60.1%	61.3%	58.7%
Montgomery	70.5%	69.5%	70.5%	71.1%
Moore	66.2%	67.6%	70.9%	68.1%
Nash	62.3%	61.8%	62.3%	63.8%
New Hanover	58.0%	59.7%	64.5%	67.2%
Northampton	55.9%	55.8%	66.0%	58.2%
Onslow	54.6%	57.6%	57.8%	55.1%
Orange	67.9%	64.5%	66.6%	72.2%
Pamlico	48.7%	62.3%	61.1%	63.4%
Pasquotank	54.7%	59.5%	58.2%	56.5%
Pender	59.5%	61.4%	59.6%	62.3%
Perquimans	52.4%	61.6%	49.7%	57.6%
Person	63.5%	57.8%	58.8%	64.3%
Pitt	55.2%	52.2%	53.1%	57.5%
Polk	67.1%	62.3%	43.3%	53.4%
Randolph	67.9%	66.8%	68.4%	70.1%
Richmond	58.5%	55.8%	55.4%	60.3%
Robeson	59.8%	57.9%	58.7%	62.1%
Rockingham	62.9%	61.2%	59.4%	61.2%
Rowan	67.0%	64.6%	66.3%	67.7%
Rutherford	67.3%	71.1%	67.2%	63.0%
Sampson	65.4%	67.2%	67.0%	69.2%
Scotland	63.6%	64.4%	59.9%	61.8%
Stanly	60.7%	64.5%	62.7%	67.0%
Stokes	66.1%	61.3%	58.5%	64.9%
Surry	64.9%	63.9%	66.0%	70.3%
Swain	35.2%	37.3%	31.5%	40.9%
Transylvania	59.4%	59.6%	67.5%	65.7%
Tyrrell	53.4%	50.0%	56.5%	53.2%

County chart continues on next page.

Appendix G: Health Choice Children Beneficiaries Receiving Oral Health or Dental Services by County (2016-2019) ***Continued***

County	Percentage of Beneficiaries Receiving at Least One Oral Health or Dental Service			
	2016	2017	2018	2019
Union	67.9%	67.7%	70.8%	72.6%
Vance	60.4%	60.9%	60.2%	60.5%
Wake	64.6%	65.2%	65.9%	67.9%
Warren	67.8%	67.5%	64.5%	64.0%
Washington	60.2%	59.5%	55.1%	62.4%
Watauga	64.2%	70.9%	72.8%	67.4%
Wayne	59.5%	58.1%	63.8%	67.5%
Wilkes	71.7%	75.3%	72.6%	73.7%
Wilson	60.7%	63.3%	60.7%	63.8%
Yadkin	64.2%	69.2%	66.5%	69.4%
Yancey	55.0%	58.8%	53.6%	60.9%
North Carolina	63.4%	63.7%	64.4%	66.1%

Source: NC Department of Health and Human Services, Division of Public Health. Oral Health Section.

Appendix H: Emergency Department Visits Related to Tooth Decay by Medicaid Beneficiaries, by Age Group (2016-2019)

Age	Dental Caries Resulting in Inpatient Admission (Rate per 100,000 Member Months)				Dental Caries Not Resulting in Inpatient Admission (Rate per 100,000 Member Months)			
	2016	2017	2018	2019	2016	2017	2018	2019
Early Childhood	2.4	2.2	2.4	1.6	100.1	76.4	77.8	113.3
School Age	1.6	1.4	2.6	2.4	116.4	75.2	80.3	134.8
Teen/Young Adult	3.2	3.6	4.1	3.2	280.2	119.0	115.0	223.6

Source: NC Department of Health and Human Services, Division of Public Health. Oral Health Section.

Appendix I: Emergency Department Visits Related to Tooth Decay by Health Choice Beneficiaries, by Age Group (2016-2019)

Age	Dental Caries Resulting in Inpatient Admission (Rate per 100,000 Member Months)				Dental Caries Not Resulting in Inpatient Admission (Rate per 100,000 Member Months)			
	2016	2017	2018	2019	2016	2017	2018	2019
Early Childhood	0.0	0.0	0.0	0.0	0.0	0.0	42.5	0.0
School Age	0.0	1.1	2.0	2.9	66.4	33.8	36.2	69.8
Teen/Young Adult	2.3	1.1	1.0	0.0	90.8	27.0	39.4	0.0

Source: NC Department of Health and Human Services, Division of Public Health. Oral Health Section.