Evaluating the costs and benefits of funding North Carolina's adult Medicaid dental benefits for non-elderly Medicaid recipients.

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Research Objective

The objective of this paper is to compare the costs and benefits of funding North Carolina's adult Medicaid dental benefits. First, a literature review was conducted on the scope of adult Medicaid dental benefits and dental-related emergency department(ED) visits. Second, the costs of dental care in the ED was compared to the cost of care at a private dental office. A decision tree was used to model North Carolina's Medicaid cohort's utilization of dental benefits. The primary outcome of interest was the change in costs associated with an ED visit for dental-related conditions when the dental benefits are funded and not funded. The results can inform North Carolina General Assembly's decision about whether to continue to fund adults' Medicaid dental benefits. The results can further inform the shortcomings in current dental care access across North Carolina.

Introduction

Oral health touches every aspect of our lives but is often taken for granted. It affects our ability to speak, eat, smile and show emotions. It also affects our performance and attendance at work and school. Oral diseases – which range from cavities to gum disease to oral cancer – cause pain and disability for millions of Americans.[1] Whether an 8-year old or an 80-year old, oral health affects everyone.

The release of the Surgeon General's report on the state of Oral Health in the United States on May 25, 2000, spurred national conversations on oral diseases that cause dental pain, diminished function, and reduced quality of life.[2] One of the important highlights of the report was that oral health and its related diseases and conditions can affect a person's overall health and well-being, including, but not limited to physical, psychological, social, and economic well-

being.[2] Unfortunately, much of this still rings true today. Poor oral health disproportionately affects low-income adults, who typically have limited access to dental providers and receive fewer oral health care services than high-income adults.[1]

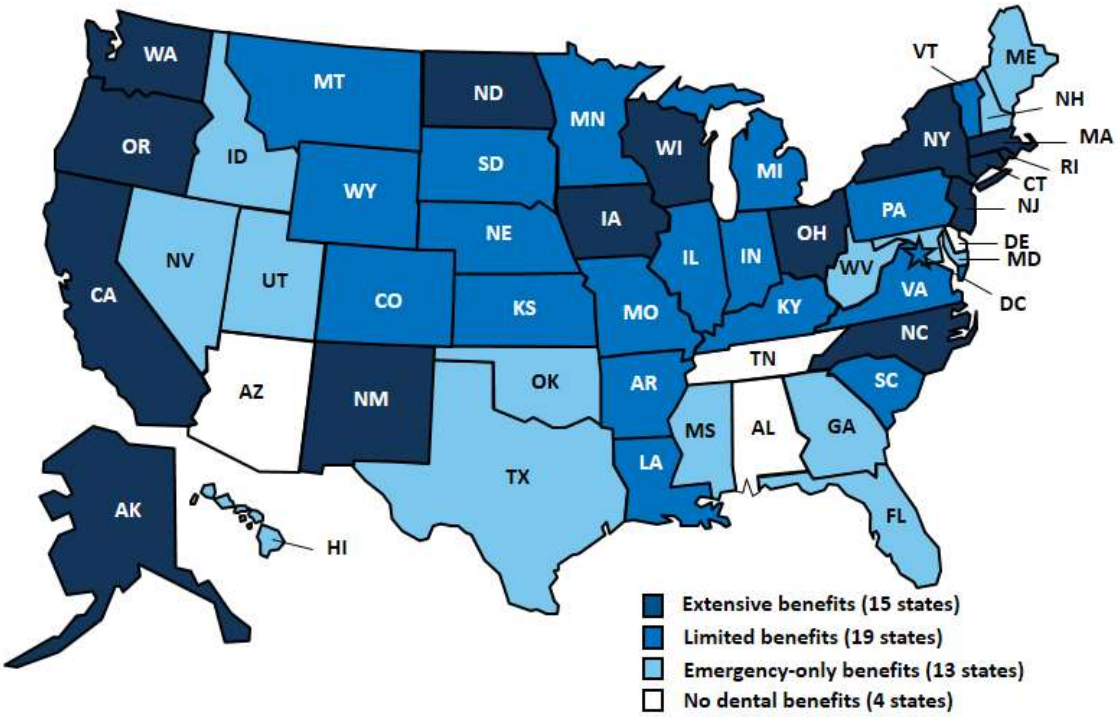
Research over the last 17 years has clarified even stronger relationships between oral health and other health conditions such as cardiovascular disease, adverse birth outcomes, diabetes, oral human papillomavirus infections, and oropharyngeal cancer.[3] Individual states have taken action – to varying degrees – to address oral health inequities through community water fluoridation, school-based dental sealant programs, oral health and primary care integration, rural clinics and attention to the dental workforce demands. Despite these efforts, access to dental providers – more so in rural areas – still remains a challenge today.

Background (Rationale) and Significance

Since 1965, Medicaid has been the major payer of health care for low-income Americans. Since its enactment, the program has provided a comprehensive mandatory benefit package for children that includes oral health screening, diagnosis, and treatment services.[1] Furthermore, in the last decade, the leadership of federal and state officials have made important progress through Medicaid and the Children's Health Insurance Program (CHIP) to address gaps in low-income children's access to dental care. Notably in North Carolina, programs such as *Into the Mouths of Babes* increased children's use of preventive and primary dental services and contributed to a statewide decline in dental caries rates since 2004.[4] The program also helped reduce the gap in tooth decay between children from low- and other-income families at the community level.[4] However, even with robust dental benefits, securing access to dental providers and services remains a challenge.

The situation for low-income Medicaid adults is more complex than that of children. Unlike children, dental benefits for Medicaid adults are not required by federal law. Rather, individual states have the option to provide dental benefits. Over the years, a majority of states have opted not to provide comprehensive adult dental benefits and have restricted services to extractions or emergency services.[1] The reason being that when states face budget pressures, adult dental services have been among the first optional services to be cut. As shown in Figure 1., North Carolina is one of the 15 states that currently provides comprehensive dental benefits. Four states – Arizona, Alabama, Delaware, and Tennessee – have no dental benefits.[1]

Figure 1. Medicaid Coverage of Adult Dental benefits, February 2016



SOURCE: *Medicaid Adult Dental Benefits: An Overview*, Center for Health Care Strategies, Inc., February 2016, http://www.chcs.org/resource/medicaid-adult-dental-benefits-overview/

Studies have shown that when states decrease or eliminate adult Medicaid dental benefits, the number of visits to the emergency room for dental-related conditions increase.[5-7]

For many years, hospital emergency departments (EDs) have been the safety net providers for patients with varying insurance statuses. Nearly 115.3 million patients make a visit to the ED in a given year, of which only 12 percent of documented visits were a serious enough condition to prompt hospital admissions.[8] With an increase in influx of patient visits, the ED has experienced overcrowding in many settings, with extended wait times for patients and insufficient staff to meet demand.[8]

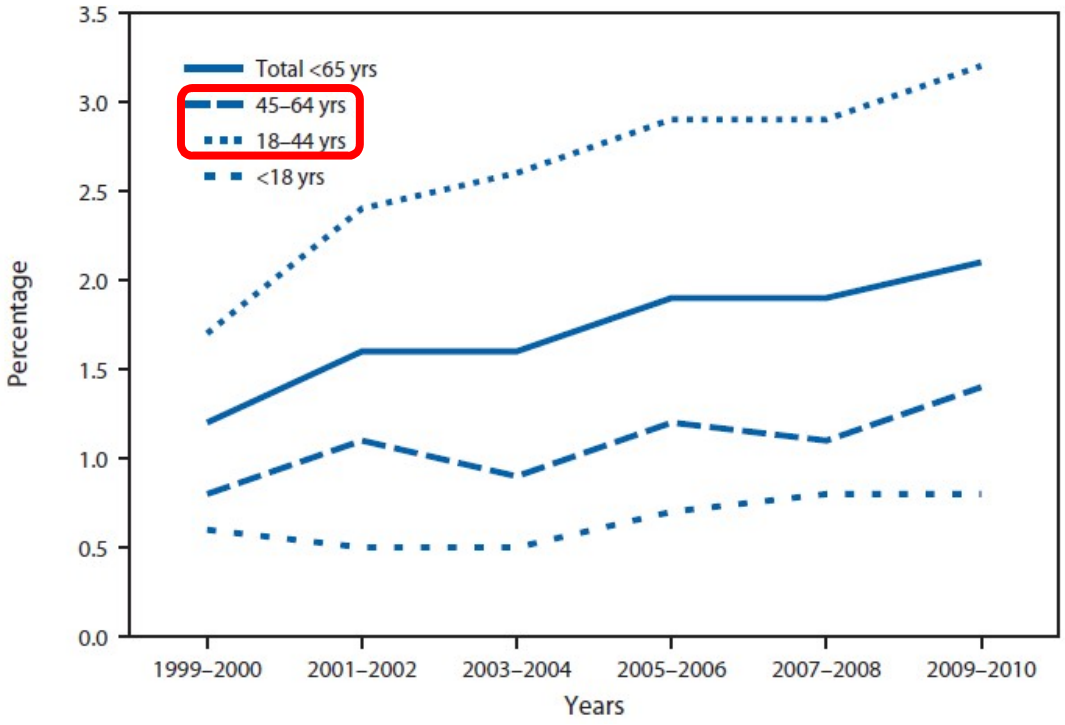
Adding to the ED's resource scarcity are visits for non-traumatic dental-related conditions. Patients presenting at the ED have a chief complaint of oral pain for conditions such as dental caries, pulpal lesions, and gingival or periodontal conditions - many of which can be routinely monitored, prevented and treated during periodic preventive oral health care, maintenance of good oral hygiene, and adoption of healthy dietary habits.[8] Additionally, the lack of access to oral health care and proper oral health education among low-income patients has made the ED an alternative site for dental care.[9] Studies have shown that EDs across the nation have continued to observe an increasing number of dental patients; from 1997 to 2007, non-traumatic dental-related ED visits increased 4 percent annually.[8-11] This concerning trend is a problem for two major reasons: first, the cost of an ED visit it expensive, and second, dental-related ED visits do not result in a proper dental diagnosis or treatment.[8,9]

In 2012, dental-related ED visits cost our health care system $1.6 billion.[12] Of the total costs, $520 million was billed to Medicaid and the average cost per patient visit was $749.[12] A North Carolina study by Hocker et al., showed the uninsured and Medicaid beneficiaries make up 83% of patients presenting at the ED for dental-related conditions.[3] As shown in Figure 2, the percentage of dental-related ED visits among persons aged less than 65 years has been

increasing. Specifically, non-elderly adults, between 18-64-years of age, make up the greatest proportion of patients, in comparison to children under the age of 18.[12]

In addition to the high cost of dental care in the ED, ED providers are not well-equipped or knowledgeable in the subtleties of diagnosis for a definitive treatment of dental-related conditions.[21] Research shows that 90 percent of dental-related ED visits do not result in dental procedures.[8] Simply, patients are provided symptom management through a prescription drug for pain relief or an antibiotic to temporarily control bacterial growth.[9,21] Because symptom management is the primary treatment provided in the ED, patients are also likely to return to the ED for the same dental problem.[8] Therefore, dental care provided in the ED is less effective in managing oral health complaints and represents a high inefficient use of limited hospital resources.[8]

Figure 2. Percentage of Emergency Department (ED) Visits That Were Dental-Related* Among Persons Aged <65 Years, by Age Group



Source: National Hospital Ambulatory Care Survey. Available at http://www.cdc.gov/nchs/ahcd.htm.

Methods

Model Structure

A decision tree model (Figure 3) was used to simulate the North Carolina adult Medicaid cohort' progression through probabilistic chance nodes following the state's decision to fund or not fund adult Medicaid dental benefits. The square represents the decision policymakers can make to fund or not fund the adult Medicaid dental benefits. The circles represent the sequence of probabilistic events that end in the triangles, which represent terminal nodes or outcomes.

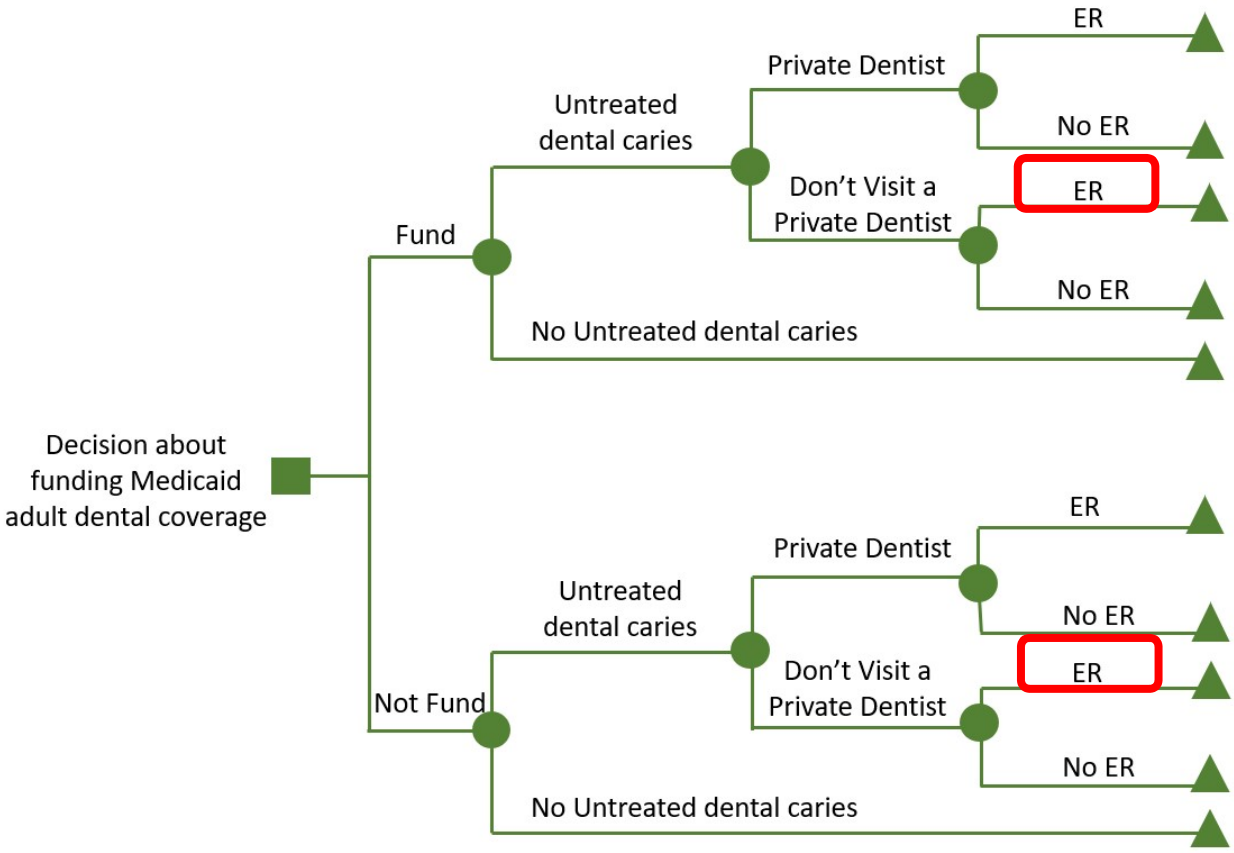
For both decisions, the sequence of probabilistic events is the same. A Medicaid patient may have untreated dental caries or not have untreated dental caries. If the patient does not have untreated dental caries, he or she is assumed to have good oral health. If the patient has untreated dental caries, he or she can use the adult Medicaid dental benefits to visit a private dentist for treatment or not. Whether or not the patient visits the dentist, he or she may make a visit to the ED for dental-related conditions. However, the probability that a patient visits the ED for a dental concern after seeing a private dentist is lower than the probability of a patient who initially seeks dental care from the ED.

The two primary outcomes of interest are the number of patients visiting the ED when adult Medicaid dental benefits are funded and the number of patients visiting the ED when adult Medicaid dental benefits are not funded. The two specific outcomes are highlighted in red boxes in Figure 3.

The decision tree model makes a strong assumption. That is, the only alternative to seeking care from a private dentist is the ED (as opposed to urgent care or primary care). For

each chance node, probabilities were obtained from the literature to subsequently calculate the number of adult Medicaid beneficiaries at each terminal node. Using a weighted average, the total costs associated with an ED visit was calculated. A weighted average was used to account for the number of reoccurring ED visits for dental-related conditions.

Figure 3. A decision tree showing the progression of adult Medicaid dental benefit recipients during a one-year period.



Data Sources

Published peer-reviewed articles and state reports were used to parameterize the decision tree model. The State Fiscal Year (SFY) 2017 Medicaid annual report table was used to obtain the number of non-elderly adult Medicaid enrollees and the total expenditures

associated with the non-elderly adult beneficiaries.[22] When North Carolina state-level probabilities were non-existent, national estimates were used as substitutes.

Specifically, the report by The Kaiser Commission on Medicaid and the Uninsured, 'Access to Dental Care in Medicaid: Spotlight on Nonelderly Adults' was referenced for the national prevalence rate of dental caries and the percentage of Medicaid beneficiaries having made a visit to a private dentist for dental care.[1] A study by Hocker et al., 'Dental Visits to a North Carolina Emergency Department: A Painful Problem' was referenced for the percentage of ED visits that were dental-related.[3]

Studies by Maryland and Tennessee were used to project the percentage increase in the number of ED visits for dental-related conditions.[5,6] Maryland and Tennessee were referenced because they were the only available state studies that observed the effect of removing adult Medicaid dental benefits on dental-related emergency department visits. Maryland currently has emergency only dental benefits in Medicaid.[1] When the state eliminated its dental reimbursement for emergency services, it observed a 12% increase in the number of visits to the ED for dental-related conditions.[5] Similarly, Tennessee currently does not provide any dental benefits for the state's Medicaid beneficiaries.[1] When the state removed reimbursement for dental services in TennCare, the state Medicaid program, it observed a 161% increase in the number of emergency department visit for dental related conditions.[6]

Results

The model projects that if the North Carolina General Assembly discontinues funding the adult Medicaid dental benefit, the state will incur an increase in costs between $400,000 and $2.2 million associated with ED visits for dental-related conditions. Table 1 shows the

projected increase in costs and the number of additional dental-related ED visits using the observed percentage increases in Maryland and Tennessee.

With a 12% increase in ED visits, the state will incur a $400,000 increase in costs associated with ED visits for dental-related conditions. With a 161% increase in ED visits, the state will incur a $2.2 million increase in costs associated with ED visits for dental-related conditions. These dollar amounts are equivalent to 540 and 2,400 additional dental-related ED visits, respectively. The increases are based on the baseline data that 1.3% of ED visits are dental-related in North Carolina.[3]

The cost of care for dental-related conditions at the ED is expensive. While the average cost of dental care in the ED is $749 per visit, the cost of care from a private dentist can be as low as one-tenth of the ED costs. For example, the 2018 Medicaid reimbursement rate for a comprehensive oral exam and cleaning is $78 for an adult and $69 or a child.[13] The costs of $400,000 and $2.2 million associated with seeking care from the ED is equivalent to paying for 5,130 and 28,200 oral exams and cleanings for an adult, respectively.

These estimates shed light on the likely increase in the number of visits to the emergency department in North Carolina when dental benefits are removed from adult Medicaid services. In the past, Maryland and Tennessee have removed dental benefits

Table 1. Projections for dental-related ED visits for North Carolina without adult Medicaid dental benefits

	Using Maryland's Estimate	Using Tennessee's Estimate
Percentage increase in ED visits	12%	161%
Dollar increase in costs	$400,000	$2.2 million
Number of additional ED visits	527	2,400
Number of oral exams and cleanings that can be provided	5,130	28,200

Discussion

Many states are experiencing an increase in the number of visits to the ED for non-traumatic dental-related conditions. The variation in the scope of dental benefits for Medicaid beneficiaries from state-to-state is one of the factors that contribute to increase in ED visits. Specifically, in North Carolina, comprehensive dental benefits are provided to adult Medicaid beneficiaries. However, coverage of dental benefits does not equate to access to dental providers.

Even with adult dental benefits for Medicaid beneficiaries, North Carolina has continued to see an increase in the number of ED visits for dental-related conditions. A study by an urban teaching institution in North Carolina documented approximately 1,000 ED visits for dental-related conditions during one fiscal year.[3] Of these visits, 22% were by Medicaid beneficiaries and 41% were by the uninsured.[3] The situation is likely to be worse in rural areas. Furthermore, North Carolina's dentists are concentrated in roughly one-fifth of the state's counties and

coincides with the urban areas of the state.[14] Three counties – Camden, Hyde, and Tyrell – have been without a dentist for more than 10 years.[15]

Therefore, while the adult Medicaid dental benefits are not sufficient to access dental providers, it is one of the protections that increases the opportunities to access dental providers. In addition to providing coverage, the access barriers must also be jointly addressed to ensure resources are allocated and utilized efficiently. This means that North Carolina should also consider what other states have done to both secure dental coverage and increase access to dental providers.

Increasing Medicaid dental reimbursement rates is politically and financially challenging but such measures have been adopted by several states. The National Academy for State Health Policy (NASHP) studied the effect of Medicaid reimbursement rate increases in six states – Alabama, Michigan, South Carolina, Tennessee, Virginia and Washington.[26] By increasing the Medicaid reimbursement rates, dental providers' participation in Medicaid increased by at least one-third and as much as one-half.[26] The study also found rate increases that meet dental providers' overhead costs were necessary to improve access to care but were not sufficient on its own. Simplified administrative processes, and collaborations with state dental societies, individual dentists, and community groups to identify best practices in oral health access were found to be more effective in increasing dental participation in Medicaid.

Direct access - allowing dental hygienists to provide certain preventive services without the direct supervision of a dentist - has been adopted by 40 states.[17] According to the American Dental Hygiene Association (ADHA), direct access refers to the ability of a dental hygienist to initiate dental treatment based on their assessment of a patient's needs without the specific

authorization of a dentist, treat the patient without the presence of a dentist, and maintain a provider-patient relationship.[16] Direct access provides dental hygienists the flexibility to provide dental care in areas where access to a dentist is limited. However, state laws vary on the scope of independent practice for dental hygienists; including the services they can provide (eg, application of fluoride, sealants, or topical anesthetic), and whether they can own or manage independent dental hygiene practices. North Carolina currently does not allow any form of direct access.[18] US studies on the expanded roles of dental hygienists on costs, quality, and access to care is limited, but international studies show a strong evidence.[20] Furthermore, oral health experts suggest that direct access for dental hygienists has the ability to increase access to care, particularly for low-income populaitons.[20]

Dental therapy is a mid-level dental workforce model that began in New Zealand, Australia and the United Kingdom. In the US, dental therapists provide preventive and restorative care such as oral exams, restorations, simple extractions, x-rays, place crowns and more, but refer complicated services to dentists. In short, dental therapists' scope of practice is beyond that of a dental hygienist, but not to the extent of a dentist. Dental therapy is a relatively new oral health workforce; the first state to license dental therapists in the United States was Alaska in 2003. Alaska licensed dental therapists to provide dental services in remote rural areas for the Alaska Native population. In 2009, Minnesota became the first state government to authorize and license dental therapists statewide. Currently, dental therapists are licensed to practice in Alaska (for Native population), Maine, Minnesota and Vermont. Ten other states also have legislation proposed to license dental therapists.[19] Based on the early findings of Minnesota's dental therapy workforce, there has been an increase in the number of

new patients served, reduction in wait times for needed services, and decreased travel times for patients.[19] However, there are mixed evidence on the dental therapy workforce's impact on rural health; there are not as many dental therapists as there are dental hygienists or dentists currently practicing. According to the early research findings on the impact of dental therapists, the workforce may reduce unnecessary visits to the emergency room for dental-related conditions by expanding capacity at dental clinics serving vulnerable populations.[19] Evidence also shows that rural clinics with dental therapists have increased the volume of Medicaid patients served by twofold.[19]

There is not a one-model solution to securing coverage and increasing access to dental providers for North Carolinians. North Carolina has surpassed other states in securing dental benefits for adult Medicaid beneficiaries, but lags behind the effort to jointly increase access to dental providers. To prevent future increases in the number of ED visits for dental-related conditions and its associated costs, the North Carolina General Assembly should conduct a thorough assessment of the state's oral health care system and adopt appropriate measures to increase access to dental providers.

Limitations

There are two limitations of this paper. First, because dental benefits for non-elderly Medicaid adults is an optional service, there is a lot of variation across states. For examples, although Maryland and Tennessee's data were used to project the potential increase in the number of emergency department visits in North Carolina, the three states' scope of Medicaid dental benefits are different. North Carolina provides comprehensive dental benefits, Maryland provides emergency only benefits, and Tennessee does not provide any dental benefits in

Medicaid. Further, the aspects of research conducted for dental-related ED visits vary widely in the target populations, outcomes of interest, data sources used, and research methods employed. Such limitation makes it challenging to apply and interpret the findings to North Carolina. Second, a strong assumption is made in modeling the decision tree. That is, the only alternative to seeking care from a dentist is the ED. While this assumption serves the purposes of simplifying and modeling the outcomes of interest, this limitation could bias the outcomes (number of ED visits and cost associated with ED visits).

Conclusion

North Carolina currently provides comprehensive dental benefits for adult Medicaid beneficiaries. Studies in other states have observed that when dental benefits are reduced or eliminated, the number of visits to the emergency department for dental-related conditions increase. Nationally, the number of visits to the ED for dental-related conditions has continued to increase, specifically among non-elderly adults. However, the costs associated with a ED visit can be as much as ten times the cost of care from a private dentist. This paper aimed to highlight the current trends in dental-related ED visits and inform the North Carolina General Assembly the importance of securing adult Medicaid dental benefits.

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