Challenges in Improving Child Dental Health in Florida: Did Pediatric Dental Emergency Visits Decline Following the 2011 State Medicaid Managed Care (SMMC) Expansion?

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CHALLENGES IN IMPROVING CHILD DENTAL HEALTH IN FLORIDA: DID PEDIATRIC DENTAL EMERGENCY VISITS DECLINE FOLLOWING THE 2011 STATE MEDICAID MANAGED CARE (SMMC) EXPANSION?

BY

Chad Thursby

A doctoral project submitted to the faculty of the Medical University of South Carolina in partial fulfillment of the requirements for the degree Doctor of Health Administration in the College of Health Professions

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CHALLENGES IN IMPROVING CHILD DENTAL HEALTH IN FLORIDA: DID PEDIATRIC DENTAL EMERGENCY VISITS DECLINE FOLLOWING THE 2011 STATE MEDICAID MANAGED CARE (SMMC) EXPANSION?

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ABSTRACT

Abstract of Doctoral Project Presented to the Executive Doctoral Program in Health Administration & Leadership Medical University of South Carolina In Partial Fulfillment of the Requirements for the Degree of Doctor of Health Administration

CHALLENGES IN IMPROVING CHILD DENTAL HEALTH IN FLORIDA: DID PEDIATRIC DENTAL EMERGENCY VISITS DECLINE FOLLOWING THE 2011 STATE MEDICAID MANAGED CARE (SMMC) EXPANSION?

By

Chad Thursby

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Committee: Kit N. Simpson, DrPH; Amy Brock Martin, DRPH

Poor oral health and periodontal disease are related to diabetes, cardiovascular disease, immune disorders, and oral cancer – all of which are ultimately related to premature mortality. In 2008, Florida was ranked as one of the worst state for dental care in the United States. Given the lack of accessibility to dental care, the emergency department (ED) has evolved to serve as a “catch basin” to provide pediatric patients with routine dental treatment. As a result, to enable the provision of dental care and improve pediatric dental health outcomes, Florida introduced a Statewide Medicaid managed care system (SMMC) in 2011.

This thesis aimed to describe emergency department usage trends that may serve as an indicator of whether the SMMC program introduced in 2011 positively affected pediatric dental ED use. A retrospective analysis was performed from 2011-2014 to identify trends in pediatric ED usage for the treatment of dental caries, pulp and periodontal disease in the state of Florida. Study findings demonstrated that there were trends for increased utilization of the ED following the introduction of the SMMC program, suggesting that the SMMC did not provide a solution to curb ED usage for the provision of dental care.
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Chapter 1: Introduction

According to the World Health Organization Oral Health Programme, oral health is essential to the general health of an individual (Petersen, 2003), as well as the overall health of a population. Poor oral health, such as periodontal disease, has been associated with diabetes, which in turn has a profound impact on cardiovascular disease and mortality (Grossi & Genco, 1998). Poor oral health is also related to microbial infections, immune disorders, injuries and oral cancer – all of which are related to premature mortality (Petersen, 2003).

Despite the importance of proper oral health, dental health coverage and benefit plans have largely overlooked a large proportion of Americans who cannot afford comprehensive nor basic dental care. States across America have thus undertaken Medicaid initiatives to promote accessibility to oral healthcare, such as the Early and Periodic Screening Diagnostic and Treatment (EPSDT) benefit. As the child health component of Medicaid, EPSDT, enacted in 1967, covers complete dental and preventive health care services for enrolled children. EPSDT is fundamental to ensuring children and adolescents receive appropriate preventive, dental, mental health, and developmental, and specialty services (Federal Medicaid EPSDT, 2012).

However, despite this comprehensive coverage, a very low percentage of covered children use preventive dental health services. Inadequate use of preventive dental care
and primary care dentistry leaves children at risk for dental emergencies that require hospital emergency department (ED) services. Thus, changes in children’s use of ED services for dental emergencies may indicate the improvement or worsening of children’s use of primary care dental services. To explore this possibility, the current project measures changes in ED dental use, for children, after a Medicaid Managed Care program was implemented in Florida.

1.1 Medicaid Coverage of Dental Healthcare in Florida
Medicaid is a publicly funded comprehensive health insurance program that was established by the Social Security Act of 1965, intended to provide specific underserved population groups with access to medical care and preventive services. Medicaid serves more than 45 million people who belong to underserved population groups including children, expectant mothers and physically challenged individuals (Williams & SpringerLink (Service en ligne), 2007). Enactment of the Affordable Care Act (ACA) in 2010 has increased Medicaid coverage in many U.S. states. However, Medicaid programs have not had consistent success in reaching their goal of providing high quality comprehensive services to their clients.

Indeed, the implementation of Medicaid programs has been undermined by numerous deficiencies. Some of these deficiencies relate to insufficient cost provisions, poor budgetary allocation strategies, and implementation of strategies that were not clearly defined or stipulated. Other deficiencies relate to ineffective management and leadership strategies, resulting in poorly organized emergency personnel, nurses, and other caregivers. As a result, the administrative costs for implementing Medicaid have increased substantially and are difficult for hospitals and other healthcare organizations to
absorb (Kominski, 2013). In addition, some patients have lost hope in the U.S. healthcare system (Rice et al., 2014). In consequence, attempts to improve Medicaid programs are abundant, and one example is changes made over the last decade in the state of Florida.

Healthcare providers in Florida have been burdened by a perpetually increasing demand for healthcare services. Florida has a growing population with an increasing aging and elderly demographic who require medical care. It also has a large uninsured population, a physician shortage, and a large group of vulnerable patients covered by Medicaid. The growing uninsured population has nearly crippled rural clinics, hospitals, health departments, and private practices. Added to this stress on the system is a very low level of payment for services provided to Medicaid patients. Thus, the statutory requirement to delivery comprehensive service to Medicaid patients at low reimbursement rates, combined with the needs of uninsured patients and the elderly, is increasing stressors on Florida from all patient healthcare delivery systems (Brooks, Menachemi, Clawson, & Beitsch, 2005).

In 2006, Florida implemented a pilot study to determine the efficacy, viability and feasibility of using a managed care approach to deliver Medicaid services in two counties. With the pilot study’s success, another three counties were included 2007, and the implementation of this service delivery approach was initiated to cover the whole state. In 2011, the program was formalized by the Florida state legislature, and managed care contraction for Medicaid services was expanded statewide as the State Medicaid Managed Care (SMMC) program (Kinney, 2015). The SMMC program did change eligibility and service for some adults. However, Medicaid services for children are federally mandated, so the implementation of the SMMC affected only the Florida
Medicaid delivery system, not children’s eligibility or the type of services covered. Thus, changes in care for children observed after the SMMC implementation are associated with changes in delivery system structure, not with individual eligibility.

Despite the success of SMMC, problems persist in the delivery of care, especially dental care. Florida’s children have a high prevalence of oral health disorders including tooth decay, which is the most common oral health disorder for children aged 2 to 10 (Austin & Wetle, 2012). However, socioeconomic and health insurance factors have negatively impacted access to dental care; as a result, uninsured children are less likely to receive consistent preventative dental care and tend to have unmet dental care needs. Black children, both U.S.- and foreign-born, have increased odds of a lack of preventative dental services than U.S.-born white children.

Complicating matters, the distressing state of Florida’s dental system has ranked as number 8 for the worst state for dental care in the U.S. (Koppelman, 2015; "National Summary of State Medicaid Managed Care Programs as of July 1, 2011,"). One-third of Florida dentists are over the age of 55 (Duncan et al., 2005), and 33% of dentists in Florida will retire over the next decade. These statistics suggest a possible collapse of the dental system. They also suggest that Florida’s current dental council has provided very little incentive provided for the recruitment and establishment of newly graduated dentists. Further devastating is that only 30 percent of Florida’s dentists accept Medicaid (Sohn, Ismail, Amaya, & Lepkowski, 2007). As a result, Medicaid patients receiving dental care in Florida report receiving poor care consistent with long waiting periods, less restorative treatments and more tooth extractions. Furthermore, there is a long period of delay between acceptance into the Medicaid program and receiving an actual visit dental
appointment. Under the current system, therefore, it is very difficult for Medicaid recipients to receive adequate forms of dental care (Hyde, Satariano, & Weintraub, 2006).

1.2 Dental Health Outcomes as Benchmarks of the Efficacy of Medicaid

Over the past two decades, there is significant increase in the number of pediatric patients presenting to the ED for treatment of dental-related concerns (Ladrillo, Hobdell, & Caviness, 2006). For example, between 1997 and 2001, the Texas Children’s Hospital in Houston reported a 121% increase in emergency room visits for dental care, which the authors attributed to poor and lack of accessibility to oral healthcare coverage (Ladrillo et al., 2006). More than 60% of these patients required treatment of dental caries (Ladrillo et al., 2006).

In the U.S., 50% of children between the ages of 6 and 8 years have dental caries, nearly 85% of adults have at least one tooth that has decayed or required fillings; 48% of adults between 35 and 44 years have had gingivitis; and more than 15% of adults older than 30 years have periodontitis (Laudenbach & Simon, 2014). Together, the cost of these dental services culminated to costing more than $86.6 billion in 2005 alone (Laudenbach & Simon, 2014). Savage and colleagues have suggested that preventative dental care can significantly reduce the future costs of dental care (Savage, Lee, Kotch, & Vann, 2004).

Given the trends of increased utilization of ED resources for dental care, ED usage may serve as an important benchmark to evaluate the accessibility of the dental safety net. By the same token, the longitudinal costs of dental care following the
implementation of Medicaid programs can provide insight into how successful the program is at targeting and improving oral health outcomes.

Consequently, in this investigation the following endpoints that can serve as surrogate markers of dental health outcomes will be evaluated:

I) Dental Caries

Dental caries are a form of tooth decay in which the tooth becomes softened, porous and discoloured. The process is caused by enzymatic destruction of tooth enamel and dentin, which left untreated, can reach the pulp. Dental caries are synonymous with dental cavities and tooth decay. The tooth decay may result from bacterial production of acids that lead to decalcification, or microorganisms that destroy the enamel or produce chelates that lead to decalcification. In children, dental caries have also been associated with bottle-feeding and radiation exposure.

II) Dental Pulp

Dental pulp refers to the center of a tooth that contains living connective tissue and cells called odontoblasts. The pulp serves a sensory role that mediates the response to temperature extremes and elicits the sensation of pain. In addition, the pulp protects the tooth by supporting odontoblasts that produce dentin. Tooth decay that causes breakdown and exposure of the pulp, such as due to trauma or dental caries, results in increased tooth sensitivity and pain. To circumvent dental pulp decay, a pulp cap procedure is
performed whereby exposed pulp is covered with a dressing or cement to protect the pulp and initiate healing and repair.

III) Periodontal Disease

Periodontal disease refers to infection of the structures that surround teeth, including gums, periodontal ligament and the alveolar bone. The earliest or initial form of periodontal disease includes gingivitis or inflamed gums. Later forms of gum disease lead to periodontitis. Early in the disease process, a plaque forms around teeth causing inflammation of gums, which bleed easily during tooth brushing. Eventually, the infection spreads and causes the gum to pull away from the tooth and create pockets where bacteria, debris and other matter collect. These pockets eventually lead to inflammation that causes degradation of teeth and bone.

1.3 Problem Statement

Medicaid’s ambitious goals and vow to provide children with access to dentists and quality dental care is floundering. In 2011, more than 76% of children enrolled in Florida’s Medicaid program did not receive dental care (Koppelman, 2015). The 24% of children who did receive dental services reported low-quality care, long waiting times and delayed services. In fact, during a yearlong U.S. study, only 1 in 5 (< 20%) Medicaid-covered children actually received a single preventative dental visit. Therefore, 75% of U.S. states provided preventative dental services to less than 30% of eligible Medicaid children ("National Summary of State Medicaid Managed Care Programs as of July 1, 2011"). No U.S. state provided preventative dental care to at least 50% of
Medicaid eligible children ("National Summary of State Medicaid Managed Care Programs as of July 1, 2011,")(CMS, 2011). What’s more, the cost of Medicaid dental visits in Florida has also increased by more than 68% (Rice et al., 2014). Increased costs of dental care are unaffordable for some families who are eligible for Medicaid. According to recommendations, children should receive at least 2 preventative dental visits per year. The one dental visit that is supported by Medicaid is certainly not enough to ensure oral health.

Herein, we present recurrent themes regarding Medicaid from health and dental access surveys conducted in 15 different U.S. states:

- States show similar dental care issues for Medicaid-enrolled children: high disease prevalence, low provider participation and insufficient funding.
- Children at the greatest risk of having dental caries are the least likely to receive access to regular dental care.
- Barriers to provider participation include low reimbursement rates in a healthcare environment with high practice overhead costs, perception of administrative problems with Medicaid programs and patients who do not “fit the expectations” of the dentist.
- Medicaid payments for dental care account for less than 3% of total state Medicaid child health expenditures.
- Limited access to dental services for Medicaid’s children is acknowledged as the “greatest pediatric healthcare concern” in many states.
• Untreated dental problems progressively worsen, ultimately requiring more expensive interventions that are often performed in hospital ER or operating room.

1.4 Research Objectives
This study has two research objectives:


II) To provide recommendations and initiatives that can be implemented to complement the existing Florida Medicaid program, as well enhance the overall quality of dental care delivered to children receiving Medicaid.

1.5 Research Hypotheses
Related to the two research objects are three research hypotheses:

I) The change in the Medicaid program structure led to improved dental health outcomes for Florida children, as defined by a reduction in the number of patients requiring urgent dental care for dental caries, dental pulp, and periodontal disease between 2011 and 2014.

II) For first year of Medicaid implementation (2011), children with private health insurance will have better dental health outcomes, defined as a reduction in the number of patients requiring urgent dental care for dental caries, dental pulp and periodontal disease, than children receiving Medicaid.

III) By 2014, children receiving Medicaid will have the same dental health outcomes, defined as a reduction in the number of patients requiring urgent
dental care for dental caries, dental pulp and periodontal disease, as privately insured children.

1.6 Population
The research population consists of children from low-income families currently receiving Medicaid or another form of dental insurance as their sole means of attaining comprehensive, high-quality dental care.

This study will review Florida’s 2011, 2012, 2013 and 2014 ED dental data to quantify initiative-driven changes over each of the four years. A four-year period of evaluation will provide sufficient data to determine the impact of the SMMC program on ED usage.

1.7 Research Significance
This research is significant in at least two ways:

I) This research will demonstrate that narrowing the dental care disparity gap among Florida children from low-income families is attainable, but a re-structuring of the general Medicaid delivery system is not enough to make a difference. It will require complementary and comprehensive efforts from health policy makers and medical practitioners to alleviate the child dental health problem.

II) This research will provide support for increasing access to preventive and primary care dental services in order to decrease dental ED use, and also support awareness efforts targeting low-income Medicaid families for improving preventive dentistry. This population will gain an appreciation of
the importance of quality dental care and personal actions that can be taken to promote long-term oral health.
Chapter 2: Literature Review

According to the World Health Organization (WHO), oral health is defined as the state of being free from chronic mouth and facial pain; throat and oral cancer; cleft palate and cleft lip; periodontal gum disease; tooth decay; loss of teeth and other disorders that involve the oral cavity ("Oral Health"). Globally, between 60-90% of school aged children have dental cavities, while severe gum disease or periodontal gum disease is found among 15-20% of middle-aged adults ("Oral Health"). Moreover, the WHO reports that there are 10 cases of oral cancer per 100,000 people ("Oral Health"). Given the prevalence of oral disease globally, the WHO is actively developing oral health policies toward mitigating the risks associated with poor dental health. In the United States, there are significant healthcare disparities that preclude the availability of essential dental care. The aim of this chapter is to provide an in depth appraisal of the emergence, need and current state of Medicare in Florida, as well as identifying gaps in the provision of current dental care policies.

2.0 The Nature of Oral Disease

In the United States, assessment of the 2008 Nationwide Emergency Department Sample identified more than 215,000 ED visits for the treatment and evaluation of dental disease in children (Allareddy et al., 2014). The most prevalent conditions that required assessment and treatment were dental caries, dental pulp lesions, and periodontal lesions (Allareddy et al., 2014).
Originally, “dental caries” referred to holes in teeth without much reference to etiology, stage of disease, and pathogenesis (Bowen, 2016). Since the 1600’s, the term dental caries has evolved to reflect a pathogenic disease process that leads to dental cavitation (Bowen, 2016). The disease process begins with the formation of a dental plaque or biofilm on the surface of a tooth. The biofilm results in the generation of an acidic environment, within which surface bacteria such as Streptococcus mutans can thrive (Bowen, 2016). The etiology of dental caries in children is thought to be based upon the complex interaction of factors such as microbial environment, genetic predisposition, biochemical environment as well as social and physical environments (Albino & Tiwari, 2016). Streptococcus mutans is thought to be the main cause of developing dental caries, although behaviors such as smoking and consuming sugar-rich foods can propel the development of dental caries (Albino & Tiwari, 2016).

Periodontitis refers to the inflammation of the tissue that surrounds teeth and leads to the shrinkage and recession of the gumline, resulting in loosening teeth. The condition itself is chronic and can be propelled by systemic stressors (Borrell & Crawford, 2012). It is also thought to originate from bacterial infection that is exacerbated by genetics, host responses, and environmental conditions. A concern of longterm and chornic periodontitis is loss of alveolar bone (Cobb, Williams, & Gerkovitch, 2009). Interestingly, the prevalence of the disease in the United States was identified as more than 87% in 1955, compared to 43% between 1985-1986, and finally reaching approximatly 4.2% by 2004 (Cobb et al., 2009). Researchers have suggested that improved personal oral hygiene and reduction in the prevalence of smoking may be
related to the overall decrease in the prevalence of periodontitis (Cobb et al., 2009). However, the occurrence of periodontitis is still related to a significant social and economic impact (Cobb et al., 2009).

Pulpitis refers to inflammatory disease of dental pulp, which also originates from a bacterial infection (Hui et al., 2016). It is thought to be the precise balance between inflammation and reparative processes that determine the severity and impact of pulp inflammation and whether a tooth may remain viable (Hui et al., 2016). In some cases, the inflammation of dental pulp may go unnoticed for long periods of time, during which the immune system attempts to destroy the invading bacteria (Zehnder & Belibasakis, 2015).

2.1 Inadequacy of Dental Care Accessibility in the United States
According to the Nationwide Emergency Department Sample, in 2008 the ED served as a “catch basin” to provide emergent dental care for more than 215,000 dental emergencies in children (Allareddy et al., 2014). Provision of dental care provided by the ED cost the United States more than $162 million and of the children treated, 32% were uninsured and 43% were covered by Medicaid (Allareddy et al., 2014). Over the same year, more than 74 million ED dental visits were dedicated to treating adults with dental caries. Medicaid funded more than 43% of dental visits (Walker, Probst, Martin, Bellinger, & Merchant, 2014). Dental evaluation and treatment accounted for between 0.2-1% of all ED visits in the United States (Walker et al., 2014). These findings suggest that there are concerns with the accessibility to dental care, and that Americans are forced to visit the ED to seek urgent treatment. These concerns are coupled with
even greater disparities observed between children residing in urban and rural America: compared to children living in urban America, children living in rural America do not have access to sufficient dental care and preventative oral care (Martin, Vyawaharkar, Veschusio, & Kirby, 2012). Given the importance of oral health (Section 2.1), these findings suggest that Americans suffering from dental caries, dental pulp, and periodontitis are at risk of developing chronic systemic diseases from the lack of accessibility to adequate dental care.

2.2 Healthcare Disparities in Florida

Florida is the 4\textsuperscript{th} most populated U.S. state with demographics consisting of 59\% Caucasians, 15\% African-Americans, and 22\% Hispanics (Kovner, Knickman, & Weisfeld, 2011). Health disparity in Florida is influenced by age and race (Austin & Wetle, 2012). Florida has a large elderly population composed of individuals over the age of 65-years old, where approximately 1 in 7 elderly residents or 15\% are residing below state poverty levels. Health disparity is also related to race whereby 21\% of Caucasian residents below the age of 64 do not have a healthcare provider, compared to 43\% of Hispanic and 25\% of African American residents (Koppelman, 2015; Kovner et al., 2011; Niles, 2015). Despite being densely populated, Florida’s economic development and growth are lagging due to so many individuals living below the state’s poverty level. Approximately 20\% of those living in poverty are children, and 15\% are residents above 65 years old, which directly influences the healthcare system. In fact, in response to the needs of the population, the healthcare system and policies have remodelled considerably (Kominski, 2013).
In comparison to other U.S. states, the population-health of Florida is below average. Kinney (2015) notes the population-health of Florida ranks below the national average population index—ranked 34th of the fifty states recorded in the American Health Rankings of 2012 (Kovner et al., 2011; Nowak et al., 2013). Moreover, the infant mortality rate in Florida is greater than the national average.

Population-health indices may be related to availability and accessibility of healthcare. As Kinney (2015) notes, the cost of health insurance in Florida decreased in 2011. However, these reduced rates were still unaffordable for a significant population group. In fact, the cost of health insurance introduced additional health disparities in Florida, where 20% of the population was uninsured (Niles, 2015). The 20% uninsured population of Florida translates into more than 3.9 million residents, far exceeding the national average of 16% (Powers, 2015). Although the vast majority of Florida’s population is supported by employer-based health insurance coverage programs, Medicaid provides coverage for 18% of the population (Niles, 2015).

Florida is composed of rural and urban counties, and the availability of healthcare services and facilities in rural counties is relatively scarce. It has been observed that rural counties fare worse than urban counties, based upon indices such as suicide, mortality, fertility and morbidity rates. Despite the enactment of healthcare policies, with a lack of available resources including financial and lack of facilities and infrastructure, it is virtually impossible for rural counties to provide healthcare that meets the state’s guidelines. Therefore, Florida’s healthcare disparity has geographical elements.

Significant healthcare disparity also exists in both accessibility and affordability. As a result, the Florida state government is tasked with the provision of dental care to the
most vulnerable populations, including children. The following sections overview Florida’s initiatives and other endeavours to provide accessible healthcare and dental care to residents.

2.3 Evolving Healthcare Policies in Florida

Further reforms to improve healthcare in Florida included the ACA’s provisions to enhance Medicaid. Medicaid in Florida is not a “static” constructed program. Rather, it evolves with the needs of the recipients and is also guided by available healthcare plans that influence participation rates among various communities. Essentially, the participation of Medicaid users in policies and coverage translates into the provision of high quality managed care systems and healthcare delivery. Thus, it is estimated that 47% of Florida’s Medicaid recipients participate in managed care arrangements (Niles, 2015). Under these parameters, Florida’s Medicaid program is tasked with providing coverage for more than 2.8 million residents (Kominski, 2013). Of those receiving coverage within Florida’s Medicaid system, 51% are children (Niles, 2015), and 28% are elderly and disabled (Kongstvedt, 2013).

The accessibility of healthcare services in rural and urban counties has greatly improved by strategies employed by Florida (Kominski, 2013; Nowak et al., 2013). However, the vast majority of the policies and programs instituted in Florida have been directed towards providing citizens with medical care rather than dental care. In particular, policies and programs have overlooked the treatment of conditions such as dental caries, dental pulp and periodontitis, even though these conditions are related to a patient’s long-term health outcomes and future costs associated with chronic diseases propagated by dental disease.
2.4 Dental Healthcare Provision by Medicaid

Many states provide coverage for dental health services using the Medicaid program. Each state varies in its mode of delivery, principles of application, and mode of implementation—as a function of the state’s economic and geographical context. However, across the states that do provide dental health coverage, the vast majority are more likely to only provide coverage for children. According to Niles (Niles, 2015), only 16 states offered all dental care services. These states included California, New York, North Carolina, and New Jersey. On the other hand, states such as Colorado, Alabama, Tennessee and Arizona did not provide any dental health services within their Medicaid program. Florida, Nevada, Texas, South Carolina, and Oregon provided limited dental health services (Nowak et al., 2013).

Dental health services provided for children under Medicaid were designed to help children attain and maintain oral health. (Medicaid programs consider dental services for individuals under the age of 21 as being vital to their oral health.) To enhance healthcare services for children, the Medicaid program was integrated with the Children’s Health Insurance Program (CHIP) (Austin & Wettle, 2012; Healey & Evans, 2015; Goodman, 1993). Medicaid and CHIP served over 40 million children in 2013 (Kinney, 2015; Kovner et al., 2011), and CHIP has served approximately 1 in 3 children (Koppelman, 2015).

The primary aim of the Medicaid and CHIP integration was to ensure that all children in the U.S. have access to comprehensive healthcare services, including dental care. Indeed, one of the most important sectors that the Medicaid programs aimed to provide coverage for was oral health. Coverage was thus extended to include preventive
dental care services, dental services treatment, and oral health consultations. The National Academy for State Health Policy reports that 49 states across the U.S. have included provisions for dental health services within their health mandates. Dental health was included in the Child Core Set targets, through which children could obtain services such as screening, treatments, and consultation on oral health concerns. Across the 49 states, it was reported that 48% of children received preventive dental healthcare, while 20% of children received dental treatment and consultations service options. Finally, it was also reported that in nearly half of the 49 states, children required various dental health services between 2007 and 2011. By the end of 2013, more than 66% of children insured with Medicaid obtained dental care and other oral health services.

2.5 Dental Healthcare Services Provisioned by Medicaid in Florida
Dental health services have become increasingly important for children due to the prevalence of dental disease and disparity in the dental health system across the country. Tooth decay is one of the most prevalent condition affecting children (Koppelman, 2015) between the ages of 2 and 5. Untreated tooth decay (dental carries) affects 20% of children between the ages of 2 and 5. Furthermore, nearly 25% of children between the ages of 6 to 10 are also affected by dental carries (Sohn et al., 2007). Teenagers require oral dental care with the most prevalent concerns being tooth extractions, fillings and braces.

Previously, many states had supported and funded programs that were aimed to prevent dental disease through education and awareness campaigns. Ultimately, these programs were unsuccessful. According to Hyde, Satariano and Weintraub (2006), most dental problems can be prevented through lifestyle and healthy diets. Good habits
supporting oral hygiene are also important and need to be taught to children. However, these are concepts that healthcare givers, parents and guardians have failed to relay, given that children across the country are more affected by dental carries than 10 years ago (Hyde et al., 2006).

In Florida, dental health has continued to deteriorate annually. Florida is ranked as the eighth worst in the country for its lack of provision of effective and quality dental care service to children and adults. Failure of the Florida dental healthcare system is evidenced by the annually increasing prevalence of oral health disease among children. Furthermore, more than 33% of dentists in Florida are over the age of 55. The system has therefore failed to recruit and train young dentists. In 2011, it was reported that approximately 76% of the children who were enrolled in Medicaid in Florida did not receive any dental care. Of the 24% of children who did receive dental care services, most complained of low quality service, long waiting times, and delayed services (Koppelman, 2015).

Another bottleneck to the accessibility of adequate dental care is that only 30% of dentists in Florida are enrolled with the Medicaid program ("National Summary of State Medicaid Managed Care Programs as of July 1, 2011"). That is, patients can only receive dental care from 30% of the already limited number of dentists in Florida. Thus, not only is there a need for young dentists in Florida; there also is a need to recruit dentists to enroll with the Medicaid program.

2.6 Inefficiency of Medicaid in supporting Different Populations in Florida
Cubanski et al. (2015) has proposed that the inadequacies observed in the Medicaid program may have resulted from a need to control expenditures and costs.
During times of economic downturn, the costs and expenses of the Medicaid soar because a greater proportion of residents have a low income. To continue programs such as Medicaid, the budget allocated subsequently has to be controlled and regulated. Fund allocation also has to take into consideration factors such as declining tax revenues and recession periods. Therefore, Medicaid programs are tasked with providing high quality care within set budgets. In order to do so, Florida and other states have taken measures such as controlling payment rates of doctors, nurses, and other healthcare providers (Kovner et al., 2011). Despite cost-saving algorithms, some populations enrolled within the Medicaid program continue to receive inefficient healthcare service (Austin & Wetle, 2012; Kovner et al., 2011).

Inefficiencies of Medicaid have also been reported across other aspects of the healthcare landscape in Florida. However, it appears that the Medicaid program’s greatest impact has been on the delivery of dental care. Compared to patients who are privately insured, those receiving Medicaid have reported receiving poorer healthcare. This is evidenced in Koppelman’s (2015) data, which showed that patients insured with Medicaid received less restorative treatment procedures than patients funded by private insurance (Koppelman, 2015). Additionally, as aforementioned, patients receiving Medicaid experienced longer waiting times, delayed services, and limited coverage that did not extend to costlier procedures such as root canals, tooth crowning and surgical extractions. As a result, patients have failed to receive required treatment due to the limited range of dental services that are insured by the Medicaid program.

Unfortunately, the Medicaid program in Florida has greatly impacted children. Children under the age of 21 were enrolled into the program to facilitate the delivery of
quality healthcare. However, of the children enrolled within the Medicaid program, sufficient dental care had been provided to only 1 in 5 (Koppelman, 2015). This means that only 1 in 5 children are able to receive treatment for dental caries, dental pulp, and periodontitis. One reason is that according to Rice et al. (2014), children insured by Medicaid received only one preventative dental care visit. Another reason is that, again, only 30% of dentists in Florida accept children on Medicaid for dental care. Finally, the Medicaid program in Florida has also impacted healthcare providers. The Medicaid program has suffered setbacks given a lack of management and leadership strategies in implementing managed care (Rice et al., 2014).

2.7 Measures to Improve the Medicaid Initiative

As developed in this dissertation, the American healthcare system is constantly evolving, and Medicaid programs are required to stay abreast of the changing landscape. The perspective of the general population has also transitioned from being disinterested and uninsured to actively engaging in healthy living and seeking insurance, following the enactment of the ACA. However, similar changes have yet to occur for dental care and specifically for treating conditions such as dental cavities, dental pulp, and periodontitis.

According to the Kaiser Commission on Medicaid and the Uninsured, it was proposed that dental health plans in Florida could have been carved out from dental health plans in the Medicaid program ("Profile of Medicaid Managed Care Programs in 2010.," September 2011.). However, this approach was not established because it could have hampered the implementation of the ACA. A more viable approach was developed by Koppelman (2015), who included reforming dental care services from within the educational system. According to this approach, the education sector would be exploited
for the provision of adequate dental care in Florida. According to several reports, the number of dentists practicing in Florida is low and most are above 55 years old. Therefore, this approach supports undertaking measures in the education sector to increase the number of students enrolled in dental schools to ensure the viability of dental care in Florida. Secondarily, the state would undertake measures to ensure that human resource allocation in dental services is improved. The state would also be tasked with ensuring the delivery of oral healthcare across the state, including rural counties ("NCQA Medicaid Managed Care Toolkit 2012 Health Plan Accreditation Standards."). With regards to the implementation of Medicaid in Florida, Koppelman (2015) notes that various activists and lobbyists in the state have politicized the dental care program. In fact, some lobbyists were fighting to support prepaid dental health plans carved out from the Medicaid program. Further politicizing included lobbying for the implementation of Medicaid limits with regards to the delivery of dental care services. As can be illustrated from these examples, it is important for the state government to restrict the influence of political lobbyists in decision-making and the implementation of Medicaid. By barring the opinions of those with invested interests in decision-making, policies that support the implementation of Medicaid across all individuals enrolled in the program will promote the viability and delivery of dental health services in Florida.

Florida’s state government should facilitate the implementation of the ACA to increase access options to Medicaid. According to Chang (2013), the state government should be at the forefront of lobbying for securing 100% federal funding for the next three-five years. There are several reasons why. Firstly, these funds would enable the government to reach more Florida residents, irrespective of income. Secondly, the
extended federal budgetary allocation would enable the expansion of Medicaid services to reduce extensive health disparities in the community. Thus, Medicaid could expand its operations and reach rural counties. Thirdly, as opposed to the current 20% of dentists in Florida under the Medicaid program, securing additional funds could promote the recruitment of additional dentists into the Medicaid program.

Chang (2013) has also suggested that insurance reforms could further improve Medicaid. Insurance reforms would include different institutions into the program, such as the Florida Health Alliance (FHA). The FHA would promote the streamlining of state government and healthcare provider activities to improve the implementation of the ACA. The FHA could furthermore develop targets for monitoring and evaluating the implementation of the ACA. Finally, the FHA would oversee that fund allocation is strictly utilized for implementing the ACA and efficient resource utilization under Medicaid programs.

To supplement these approaches, the Florida state government could develop measures for monitoring the efficacy of the Medicaid. Such measures may allow for quantifying, monitoring and determining the growth of the Medicaid program in Florida. With this data, the Florida government may be more likely to gain funding support from the federal government, as the state will be able to quantitatively define the need and provide measures of healthcare delivery improvement achieved with the current Medicaid program.

However, the problem for most Medicaid programs to date has been that there is a lack of available markers of success. Some consider enrollment rates to demonstrate the success of a program, while others consider the accessibility of rural citizens to dental
services as a measure of success. Given the lack of a standardized measure of success, it is extremely difficult to compare the efficacy of the range of initiatives instituted. In terms of positive health outcomes and future risk of chronic disease, the most viable markers of the success of a dental program are treatment rates of dental caries, dental pulp, and periodontitis. Moreover, to determine whether a dental program has been efficacious in providing accessibility to dental care, then the rates of patients treated in the ED is a strong benchmark.

2.8 Dental-Related Emergency Department Visits as a Benchmark of the Efficacy of Medicaid

Dental-related ED visits may serve as a benchmark for the state government. Across the U.S., the numbers of dental ED visits are increasing significantly (Ladrillo et al., 2006). Approximately 42% of all dental ED visits are for dental caries (Seu, Hall, & Moy, 2012). Most often, ED physicians only prescribe painkillers or antibiotics to reduce infections (McCormick, Abubaker, Laskin, Gonzales, & Garland, 2013). Patients are more likely to receive specialized and more appropriate care by dentists rather than ED staff. Moreover, patients waiting to see doctors in ED have to wait in long lineups, as patients who present with life threatening medical emergencies will be treated first. Dental-related ED visits for non-traumatic dental conditions reflect an inappropriate use of the ED, given that patients who have life-threatening urgent medical conditions require immediate assistance. EDs are already burdened with fewer beds and greater patient burden, so allocating a patient bed for a dental infection may not reflect an appropriate use of the ED resources (Okunseri, Okunseri, Thorpe, Xiang, & Szabo, 2012).
Between 2000 and 2010, the number of patients presenting to the ED for dental-related concerns increased from 1.1 million to 2.1 million (Wall & Nasseh, 2013). It is estimated that the dental ED treatment cost in 2010 was between $867 million to $2.1 billion (Wall & Nasseh, 2013). The drastic increase in patient presentation with dental-related conditions is speculated to have arisen from the lack of dental care insurance coverage (Wall, 2012; Wall & Nasseh, 2013). Among those who present with dental concerns at the ED, the majority of patients are young or middle-aged adults who either have Medicaid or no health insurance coverage (Seu et al., 2012).

As has been discussed, in Florida prior to 2011, there was a lack of health insurance coverage for dental-related ED visits. Therefore, many children were left with no dental care during this period. However, since 2011, provisions have been made to provide children with dental-related ED coverage. Therefore, the aim of the present study is to determine whether the oral health outcomes (defined as the treatment of dental caries, dental pulp, and periodontitis), of children in Florida have improved with dental ED insurance coverage. Secondarily, this research will demonstrate the feasibility of utilizing dental ED visits as a benchmark.
**Chapter 3: Methods**

In this chapter, the methodology implemented to address the research hypotheses and objectives is presented. The study design, primary end-points, and statistical analyses employed are also presented. As an overview, a retrospective study design was used where Florida’s medical billing and coding registry was interrogated for the incidence of ED dental visits for treatment of dental caries, dental pulp and periodontitis.

**3.1 Study Design**

In this study, Florida’s medical billing and coding registry was retrospectively assessed. The registry was interrogated for all events that met the following inclusion criteria:

1) Patient was under the 18 years at the time of the ED visit.

2) Patients only of Caucasian, African American and Hispanic descent were included.

3) ED visits performed only in the State of Florida were included.

4) ED visits between January 1, 2011 and December 31, 2014 were included.

5) Primary payers of dental treatment costs assessed include Medicaid, Private Insurance, Self-Pay, No Charge visits as well as other forms of payment.

6) International Statistical Classification of Diseases and Related Health Problems: ICD-9 codes evaluated include those for:
a. Dental Caries (ICD-9 CM codes 521.00, 521.01, 521.02, 521.03, 521.04, 521.05, 521.06, 521.07, 521.08, 521.09).

b. Pulp or Periapical Lesions (522.00, 522.1, 522.2, 522.4, 522.5, 522.6, 522.7, 522.8, 522.9).

c. Gingival or Periodontal Conditions (523.00, 523.01, 523.10, 523.11, 523.20, 523.21, 523.22, 523.23, 523.24, 523.25, 523.3, 523.30, 523.31, 523.32, 523.33, 523.40, 523.41, 523.42, 523.5, 523.6, 523.8, 523.9).

3.2 Primary End-Points

In this investigation, the primary end-points assessed included:

1) The number of ED dental visits that meet the inclusion criteria.
2) The cost of each ED dental visit.

3.3 Statistical Analysis

All statistical analyses were performed using IBM® SPSS® Statistics package version 23. Data are presented as mean ± standard deviation. A p value of less than 0.05 defined statistical significance. Descriptive statistics were computed for patient demographics. Comparisons between 2 groups were performed with an independent samples t-test. To compare between more than 2 groups, one-way analysis of variance or ANOVA was performed. Chi-square tests were used to evaluate the relationship between categorical variables.
Chapter 4: Results

This chapter of the dissertation presents the outcomes of the research hypotheses and objectives tested in this investigation. General information about the study cohort, participant demographics and incidences of ED dental visits is provided. In addition, the annual number of pediatric patients treated in Florida’s ED for dental caries, dental pulp and periodontitis are presented.

4.1 Study Demographics

In this study, patients under the age of 18-years visiting the ED for urgent dental care in Florida were retrospectively assessed. Eligible patient visits between January 1, 2011 to December 31, 2014 were included for assessment.

During the study period, 16,090 patients met inclusion criteria and thus were recruited into the study cohort. The mean age of the study cohort was 10.2±4.5 years, and 51% of the study cohort was male (n=8213) while 49% was female (n=7877). In terms of race, 39.7% of the cohort was of Caucasian descent (n=6388), 38.7% of African-American descent (n=6231), and 21.6% Hispanic (n=3471).

4.2 Number of Dental Visits

Between January 1, 2011 and December 31, 2014, 16,090 visits to the ED for dental care were registered in the state of Florida. Of these visits, 3530 occurred in 2011, 4056 in 2012, 4165 in 2013 and 4339 in 2014 (Figure 1).
During 2011, 75.3% of visits were paid for by Medicaid (Figure 2). Likewise, Medicaid remunerated 75.1% of visits in 2012. In 2013, visits paid for by Medicaid increased to 78.5% and reached 81.3% in 2014.

![Graph showing annual number of emergency department dental visits in Florida between January 1, 2011 and December 31, 2014. Over the four-year period of evaluation, it was observed that there were trends towards a progressive increase in the annual number of emergency department dental visits.](image)

*Figure 1 The annual number of emergency department dental visits in Florida between January 1, 2011 and December 31, 2014. Over the four-year period of evaluation, it was observed that there were trends towards a progressive increase in the annual number of emergency department dental visits.*
Between January 1, 2011 and December 31, 2014, it was observed that the primary payor for the vast majority of pediatric ED dental visits in Florida was Medicaid. Moreover, there were trends towards an increase in the annual number of Medicaid pediatric patients treated by the ED for emergent dental care.

4.3 Total Charges and Primary Payer

Between January 1, 2011 to December 31, 2014, the total cost for the 16,090 visits to the emergency room for dental care amounted to $17,376,483.00. The average cost for dental care provided by the emergency room was $1081.03±1629.50.
the average charge was $959.00±1553.58. This amount progressively increased to $985.65±1532.13 (2012), $1116.80±1630.38 (2013) and finally to $1235.03±1758.69 in 2014 (p<0.001, Figure 3).

Of the 16,090 emergency room dental care visits, the primary expected payer for the vast majority of cases was Medicaid (p<0.001, Figure 4). In fact, Medicaid assumed costs for 12,052 visits or 77.7% of all visits. Private insurance covered the cost of 1240 or 7.7% of visits. Patients self-paid for 1694 or 10.5% of visits. There was no charge billed for 84 visits (0.5%), and other forms of payment were used for 570 visit (3.5%).

In terms of the average cost billed for an emergency room dental visit, the charges billed to other forms of payment were the costliest ($1245.03±1905.97, p<0.001; Figure 5). This was followed by the charges billed to private insurance ($1227.48±1916.47). Charges billed to Medicaid ranked as the third greatest ($1078.99±1626.23). The least expensive were self-paid emergency room dental visit charges ($937.98±1307.29).
Figure 3 Over the course of this study, the average cost of emergency department dental care visits in Florida increased from $959.00 in 2011, to more than $1,200 in 2014 ($p<0.001).
Figure 4 Medicaid served as the leading primary payer of emergency department dental-related treatment in Florida. Between 2011 and 2014, more than 77% of emergency room dental visits were funded by Medicaid, while the remainder were predominantly self-paid or covered by private insurance (p<0.001).
Between 2011-2014, the average cost of emergency room dental treatment in Florida billed to Medicaid was $1,078.99, which was less than that billed to private insurance ($1,227.48). In fact, the average cost of dental care billed by an emergency department was greatest for private insurance, and least when self-paid (p<0.001).

4. 4 Dental Caries

Over the four-year study period, 8943 dental caries were treated by emergency rooms across Florida, representing 55.6% of the study cohort. In 2011, 2,277 dental caries were treated. A reduction was observed in 2012 (2,193) and 2013 (2,186), followed by an increase in 2014 (2,287) (p<0.001, Figure 6).
Of the dental caries treated by ED, more than 78% were remunerated by Medicaid (p<0.001, Figure 7). Private insurance paid for approximately 7% of dental caries treated, while 11.5% (1,030) were paid by self-paying. The average visit to the ED for the treatment of dental caries amounted to $969.82±1533.57, which was significantly less than the cost of visiting the emergency room for other dental-related care ($1220.29±1732.26, p<0.001).

Figure 6 Over the period of investigation, there was reduction in the number of patients presenting to the emergency department with dental caries in 2012 and 2013. However,
in 2014, the number of patients presenting with dental caries had increased to 2,287 ($p<0.001$).

Figure 7 Of 8,943 dental caries treated in the emergency department, Medicaid financed 7,006, 1,030 were self-paid and private insurance provided funding for 596 cases ($p<0.001$).

4.5 Dental Pulp Restoration Procedures

Emergency departments in Florida treated 7,597 cases (47.2% of the study cohort) of dental pulp between 2011 and 2014. Interestingly, there was a progressive increase in the number of patients treated for pulp (Figure 8). Specifically, 1,799 cases of pulp were treated in 2011, increasing to 1,844 in 2012, 1,942 in 2013 and 2,012 in 2014 ($p<0.001$).
Medicaid provided compensation for more than 77% (5,881, Figure 9) of pulp cases treated by ED. Patients self-paid for approximately 10% of pulp cases, while private insurance provided funding for approximately 8% of pulp treatment protocols. Compared to the cost of treating other dental complications in the ED, the cost of treating pulp was significantly greater as it was $1192.01±1740.72 on average, compared to $981.80±1516.42 for other dental procedures (p<0.001).

Figure 8 Between 2011-2014, there was a progressive increase in the number of patients presenting to the emergency department for urgent dental pulp treatment (p<0.001).
In terms of the primary payer, the vast majority of patients who received emergency department treatment for dental pulp were financed by Medicaid, followed by self-paying and private insurance ($p<0.001$).

### 4.6 Periodontal Conditions

In this study cohort, the number of periodontal conditions that were treated by ED in Florida included 2028, or 12.6% of the study cohort. Interestingly, during 2011 there are no registered cases of treating patients for periodontal disease ($p<0.001$, Figure 10). In 2012, 693 patients were treated for periodontal disease. Similarly, 666 and 669 patients were treated for periodontal disease during 2013 and 2014, respectively (Figure 10).
Of the 2028 periodontal conditions treated, approximately 77% were paid for by Medicaid (1,567, Figure 11). Medicaid was the leading payor of periodontal conditions, followed by self-payment (186 cases) and private insurance (166 cases) (p<0.001, Figure 11). The cost for visiting the emergency with periodontal conditions ($1097.34±1726.46), did not differ from the cost of visiting for all other dental-related concerns ($1078.68±1615.09) (p=0.630).

Figure 10 In 2011, there were no registered cases of patients visiting the emergency department for urgent treatment of periodontal disease. However, between 2012-2014, more than 650 patients sought urgent periodontal disease treatment (p<0.001).
More than 77% of patients who received emergency department treatment for periodontal disease were financed by Medicaid, followed by self-paying and private insurance (p<0.001).

4.7 Repeat Dental-Related Emergency Department Visits

In this investigation, there were 2861 repeat dental visits to the ED. These 2861 dental visits translate into the fact that approximately 18% of the visits in this study cohort reflected repeat dental care that was required on an emergent basis. In terms of the study cohort, patients registered as a repeat dental visit were slightly older (repeat: 11.2±4.4 years vs. standalone: 10.0±4.6 years, p<0.001).

Interestingly, the cost of a repeat dental visit ($1093.51±1505.98) did not differ from the cost of a standalone dental visit ($1078.33±1655.03) (p=0.652). Medicaid
funded approximately 81% (2,313) of repeat dental visits. In fact, Medicaid was the leading primary payor of repeat dental visits, followed by self-paying (249) and private insurance (200) (p=0.001, Figure 12).

Of the repeat dental visits, 1723 required treatment for dental caries, 1433 required treatment of pulp, and 222 required treatment for periodontal disease.

Compared to patients presenting as a standalone visit, those presenting for repeat dental visits had a greater proportion of dental caries (p<0.001) and pulp treatment (p<0.001), but had a lower proportion of periodontal disease (p<0.001).

Figure 12 More than 81% of patients who required repeat emergency department dental treatment were funded by Medicaid, followed by self-paying and private insurance (p<0.001).
Chapter 5: Discussion

In 2011, Florida launched the SMMC program with the intention of improving accessibility and health care delivery to the most vulnerable population groups, including children and elderly citizens. One of the objectives of this program was to provide children with accessible dental healthcare. As demonstrated in this project, since the inception of this program in 2011, no significant positive impact on dental health outcomes has been observed. In fact, findings from this study demonstrate that the disparity in health outcomes progressively worsened between 2011 and 2014.

More specifically, it was observed that there was a progressive increase in the annual number of ED visits for treatment of dental-related urgent concerns. In 2011, 3530 children were treated in the ED for dental concerns, which increased to 4339 visits by 2014. Of these visits, approximately 75% of these children were on Medicaid in 2011, further increasing to 81% in 2014. These statistics have several implications. Firstly, in the literature review provided in Chapter 2, it is well established that the population in Florida increases every year. Whether this increase in population growth translates into an increase in the number of patients who visited the ED for urgent dental care is not known, although it certainly may be a component of the growth in emergency-department dental treatment visits.
Secondly, when SMMC was introduced, initiatives were undertaken to increase accessibility to dental health specialists. Despite these initiatives, it was found that in 2009-2010, less than 30% of practicing dentists in Florida accepted patients who were on Medicaid ("Florida Department of Health. Report on the 2009-2010 workforce survey of dentists.," 2011). Furthermore, on January 2, 2015, Federal Judge Adalberto Jordan ruled that children in Florida do not receive the medical or dental care that is required by federal law. Judge Jordan ruled that current state of dental care in Florida violates Federal laws, given that more than 79% of children who were enrolled in Medicaid did not receive any dental services. The judge also highlighted the fact that the vast majority of patients are required to travel great distances to receive dental care and that there is a shortage of available infrastructure (Findings and Conclusions for Case No. 05-23037-CIV-JORDAN/O’SULLIVAN; http://www.drbicuspid.com/user/documents/content_documents/nws_rad/2015_01_02_14_59_17_167_fl_a_medicaid_jordan.pdf). Therefore, even following implementing the Medicaid program, there continues to be a severe shortage of infrastructure available to support the needs of the Medicaid population. As a result, Medicaid recipients may have resorted to using the ED to receive treatment for dental concerns, which could explain the observed findings of a progressive increase in Medicaid-funded ED dental treatment visits between 2011-2014.

In the current study findings, more than $17 million was spent to treat children presenting to ED with urgent dental conditions across Florida from 2011-2014. Medicaid absorbed more than 70% of these costs. On the other hand, less than 8% of this cost was paid for by private insurance. This finding suggests that patients who received private insurance were less likely to seek treatment at an ED. Others have similarly reported that
the Medicaid program increases and fosters ED use (Fingar et al., 2015; Taubman, Allen, Wright, Baicker, & Finkelstein, 2014).

In this project, dental health outcomes were defined in terms of dental caries, dental pulp and periodontal disease. In terms of dental caries, it was observed that the Medicaid program introduced in 2011 led to a very slight reduction in the number of patients presenting at the ED for treatment of dental caries in 2012 and 2013. This decline was, however, short-lived given that the number of patients presenting with dental caries increased in 2014. Moreover, the number of patients requiring dental pulp treatment increased progressively over the study period. Interestingly, although there were no cases of periodontal disease reported in 2011, more than 660 children presented to the ED for treatment of periodontal disease in each consecutive year. Again, Medicaid funded more than 75% of dental visits for each measure of dental health outcomes, suggesting that patients who had private insurance or other means of funding their dental health concerns sought dental treatment elsewhere. As there was slight to no longitudinal reduction in the number of patients presenting with dental caries, dental pulp and periodontal disease, Medicaid did not demonstrate an improvement in dental health outcomes in this cohort. Had an improvement been noticed, there would have been a reduction in the use of the ED for treating dental conditions. Likewise, Fisher and Mascarenhas, report that children who received Medicaid do not have better dental health than uninsured Medicaid-eligible children (Fisher & Mascarenhas, 2009).
5.1 Study Limitations

Although the study findings provided herein are interesting as it provides insight into the incidence of pediatric emergency dental visits following the implementation of the SMMC program, there several limitations. First, the study design is retrospective. Second, in the ideal analysis framework, findings obtained following introduction of the SMCC would be directly compared against baseline findings obtained prior to 2011. Unfortunately, these findings were not accessible in the current registry. Third, the findings obtained in this research may not be generalizable to other states or populations. Florida represents a state with a constantly growing population density and severe shortage of dentists accepting patients on Medicaid. Whether this is also true of other states, cities, and communities is not known. Finally, in future research, a longer period of analysis should be performed. Given that there is a transition period following launching a program, there may be some time required for healthcare providers and patients to acclimitize and gain awareness of the current program. Long-term follow-up will allow a stable state to be reached and to draw further conclusions.

Despite the limitations, this study is novel because it provides insight into the incidence of dental health outcomes observed following the implementation of the SMCC program. Moreover, novel findings are also presented on repeat dental visits to the ED, which are important indicators of the efficacy of preventative dental health measures introduced with the SMCC program. Overall, this study is important for political decisionmakers and policymakers. As presented in the following section, the study findings provide insight into developing customized and tailored reforms to the SMCC program in Florida.
Chapter 6: Conclusions

The objective of this investigation was to extrapolate the impact of Florida’s Statewide Medicaid program on dental health outcomes. The central hypothesis of this study was that Medicaid would improve dental health outcomes, as defined by a reduction in the number of children presenting to the ED for urgent treatment of dental caries, dental pulp and periodontal disease. However, between 2011 and 2014, it was found that the incidence of patients presenting to the emergency room for treatment of dental caries, dental pulp and periodontal disease increased progressively over time. Therefore, this hypothesis could not be supported by the study findings.

Likewise, the secondary and tertiary hypotheses of this thesis were focused on comparing dental health outcomes of children receiving Medicaid against private insurance. It was hypothesized that during the first-year that the program is implemented (2011), children receiving private insurance would have better dental health outcomes than children on Medicaid. By the fourth year of the program, it was expected that children receiving Medicaid would have the same dental health outcomes as children who had private insurance. These hypotheses were developed to take into account the transition period required to generate awareness about the program and implement the program during its first year, 2011. By 2014, it was expected that the program would be running efficiently and that children would have not only received the required dental care by private dental clinics, but also preventative dental health treatment. However,
these hypotheses were unsupported by the study findings, which demonstrated that Medicaid children fared significantly worse than privately insured children. In fact, the ED primarily provided dental care for a substantial portion of Medicaid recipients. Furthermore, approximately 18% of the urgent dental visits in the ED reflected repeat dental visits. In these cases, the ED served as a primary dental care provider, which was certainly not an aim set forth by the SMCC Medicaid program.

The ED in any community serves to treat patients who require lifesaving and urgent therapy. By allocating staff, beds and resources to treating a dental condition takes away from the resources available to treat patients with urgent life-threatening conditions. The function of an ED is not to serve as a safety net for catching and accommodating Medicaid patients. The fact that the ED served as a primary dental care provider in Florida from 2011-2014 is worrisome and demonstrates that there is a) a need for accessible dental care, and that b) Medicaid has failed to accomplish its ambitious goals of providing adequate dental care, as well as preventative dental care, to children from low-income households.

The lack of efficacy of Medicaid for improving dental health outcomes in Florida heralds from the synergistic impact of various independent factors. These factors include that there is an ever-increasing population growth in Florida, which renders the system incapable of meeting perpetually rising demands. Despite the growing population density, the vast majority of dentists in Florida do not accept patients on Medicaid. This stems from poor and low-levels of reimbursements provided to dental health practitioners. Also relevant is that the current dental health practitioners are aging, and over the next decade or so, will begin to retire, while the state’s dental health colleges have not
recruited emerging dentists to the state. For many Medicaid residents in Florida, there is
a lack of accessible dental health clinics requiring patients to travel great distances to
receive therapy. Yet, the state has done little to provide patient transport options. The
SMCC program had aimed to develop strategies for preventative dental care, yet these
have not been provided to children currently receiving Medicaid. When these factors are
viewed in conjunction with the study findings, it appears that the Florida Medicaid
program is fledgling and does not address the needs of the population. Importantly, what
can be learnt from the implementation of the SMCC program is that a system or program
cannot be created based upon political agendas, but rather has to survey the population
needs and infrastructure in order to be efficacious.

6.1 Recommendations for Improving the Efficacy of Florida’s Medicaid Program

Based upon the study findings and literature review of this thesis,
recommendations are provided to strengthen and address the weaknesses of the current
Medicaid program operating in Florida (Table 1). An in-depth appraisal of Florida’s
current SMMC Medicaid program was performed. From this review, specific reforms to
the infrastructure, dental colleges, dental practitioner and preventative dental care are
presented. An overview of the recommendations is provided here.

In terms of infrastructure, current issues that face the implementation and efficacy
of Florida’s SMMC Medicaid program are the fact that there is a severe lack of
accessibility to dental care. Firstly, it is observed that approximately less than 20% of
dentists accept Medicaid patients. This limitation can be overcome by setting mandatory
quotas whereby dentists practicing in Florida have to include Medicaid patients as
approximately 20% of their patient load. Accessibility to dental care provision is also hampered by the physical distance to dental clinics for rural residents of Florida. This limitation can be mitigated by either providing patients with transport options or developing traveling clinics that physically locate to rural centres to treat patients.

Likewise, dental college reforms are urgently needed in the State of Florida, given that a large proportion of current dentists are nearing retirement age. Despite this, the dental colleges operating in Florida have not increased student training quotas nor made significant effort to retain newly-trained dentists in the state of Florida. Reforms required to overcome these conditions are that the dental colleges need to increase the number of trainees accepted into dental programs annually. Moreover, incentives and mandatory service requirements are needed to retain newly trained dentists in Florida.

Current dentists in Florida have expressed dismay with the reimbursement levels of treating Medicaid patients. To overcome this, federal and state funds have to be allocated to increase reimbursement rates for treating Medicaid patients. In addition, dentists have found the reimbursement system to be difficult to utilize, as well as the manner in which dental care provision is coded. Therefore, the software, policies and procedures for reimbursement have to be made more user-friendly. There should also be staff available to assist dental practitioners with billing and reimbursement procedures.

Finally, preventative dental care strategies have greatly been overlooked in previous dental care provision programs. Therefore, one of the aims of the SMMC Medicaid program was to indeed provide pediatric dental patients with preventative dental care. The provision of preventative dental care can be improved by adding fluoride to the local drinking water supply and mandate that all pediatric patients receive...
a semi-yearly or yearly follow-up dental visit to perform dental cleaning, fluoridation and treat early forms of dental decay.
Table 1 Recommendations and reforms to Florida’s current Statewide Medicaid Managed Care (SMMC) program are presented. In-depth reforms to Florida’s infrastructure, dental colleges, dental health practitioner guidelines and preventative dental care are presented. It is expected that these reforms will improve the provision of pediatric dental care in Florida.

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<th>Recommendations and Reforms Required to Support Florida’s Statewide Medicaid Managed Care (SMMC) Program for Improving Health Outcomes</th>
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<td><strong>INFRASTRUCTURAL REFORMS REQUIRED</strong></td>
</tr>
<tr>
<td>• Create private SMMC dental health clinics to only serve the Medicaid population</td>
</tr>
<tr>
<td>• Establish mandatory quotas whereby each dentist will have to treat Medicaid patients as 20% of their patient load</td>
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<tr>
<td>• Provide Medicaid patients with transportation to their medical appointment, should the distance of the medical clinic be more than 30KM away from the patient</td>
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<tr>
<td>• Develop traveling dental health clinics that drive across Florida’s rural landscape and treat Medicaid patients</td>
</tr>
<tr>
<td><strong>DENTAL COLLEGE REFORMS REQUIRED</strong></td>
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<tr>
<td>• Increase the intake of students applying to become dentists across the state’s dental colleges</td>
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<tr>
<td>• Lower education and training costs for dentists who contractually agree to serving Florida for 5-years following graduation</td>
</tr>
<tr>
<td>• Attract national and international talent to dental colleges in Florida</td>
</tr>
<tr>
<td><strong>DENTAL HEALTH PRACTITIONER REFORMS REQUIRED</strong></td>
</tr>
<tr>
<td>• Develop incentives for dentists to delay their retirement, until such time that the next generation of dentists is able to treat Florida’s Medicaid population</td>
</tr>
<tr>
<td>• Increase the efficiency of the system billing and reimbursements by Medicaid</td>
</tr>
<tr>
<td>• Increase the level of Medicaid reimbursements provided to dentists</td>
</tr>
<tr>
<td>• Create incentives for dentists to include and treat Medicaid patients</td>
</tr>
<tr>
<td><strong>INVEST IN PREVENTATIVE DENTAL CARE</strong></td>
</tr>
<tr>
<td>• Add fluoride to the drinking water supply of Florida</td>
</tr>
<tr>
<td>• Perform a semi-yearly or yearly follow-up in all Medicaid recipients to perform dental cleanings, apply fluoride treatments and repair any dental caries</td>
</tr>
</tbody>
</table>
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