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AN EXAMINATION OF THE PRIVATE DENTAL PRACTICE SYSTEM AND THE ORAL HEALTH SAFETY NET IN OKLAHOMA IN THE CONTEXT OF EXISTING DENTAL DISPARITIES

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A THESIS APPROVED FOR THE
COLLEGE OF PROFESSIONAL AND CONTINUING STUDIES

BY

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This is dedicated to the remarkable people

who work through the oral health safety net

to bring hope and healing to Oklahomans in need.

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Table of Contents

Acknowledgements v

Table of Contents vi

List of Tables viii

List of Figures ix

Abstract x

Chapter 1: Introduction 1
- Statement of Problem 3
- Aim, Scope, and Methods 3
- Overview 4

Chapter 2: The Private Practice System 6
- History and Evolution of Dentistry 6
  - *The Profession of Dentistry* 6
  - *The Business of Dentistry* 9
  - *The Workforce of Dentistry* 12
- History and Evolution of Private Dental Coverage 16

Chapter 3: Oklahoma's Oral Health Safety Net 22
- Medicare and Medicaid 23
- Hospital Emergency Departments 27
- Low-Cost Dental Clinics 28
  - *Federally Qualified Health Centers* 29
  - *Non-FQHC Low-Cost Clinics* 30
  - *Academic Dental Institutions* 31
- Free Clinics and Programs 35
  - *Mobile/Portable Dental Clinics* 36
  - *Free Dental Clinics (Fixed Clinics)* 42
  - *Facilitation Programs (Non-Clinical)* 44
  - *Dental Professionals* 47
  - *Health Departments* 48

Chapter 4: Dental Disparities 50
- Oral Health and Social Justice 53
- Barriers to Dental Care 56
- How Dental Disparities Impact Underserved Populations 60

Chapter 5: Conclusion 67

References 69

APPENDIX A: Oral Health Defined 85
APPENDIX B: Oral Health Conditions 87
APPENDIX C: Dental Treatment and Costs 89
APPENDIX D: Fee Comparisons 92
APPENDIX E: Dental Health Professional Shortage Areas 93
APPENDIX F: Federally Qualified Health Centers and Satellite Sites 94
APPENDIX G: Areas within a 30-minute Drive Time of an FQHC 95
APPENDIX H: Images of Mobile and Portable Clinics 96
Endnotes 97

List of Tables

Table 1. Components of the oral health safety net in Oklahoma 23

Table 2. Oklahoma Mission of Mercy Statistics 39

Table 3. MobileSmiles Oklahoma Statistics - Past 5 years 42

Table 4. Free Dental Clinics in Oklahoma 43

List of Figures

Figure 1. Equality vs. equity 51

Figure 2. Relative influence of the five major health determinants 53

Figure 3. Prevalence of total and untreated dental caries among children aged 2-19 years, by race and Hispanic origin: United States, 2015-16 62

Figure 4. Prevalence of total and untreated dental caries among children aged 2-19 years, by federal poverty level: United States, 2015-16 63

Abstract

The health care system in America does not work for everyone. Specifically, the oral health care system has inherent historical, economic, and scientific aspects which combined, result in a fragmented system that disenfranchises many population groups. In Oklahoma, the existing safety net of underfunded public dental health benefits augmented by charitable, volunteer-driven endeavors is not enough to meet the needs of these underserved and vulnerable populations, as evidenced by persistent dental disparities. However, a shift in societal attitudes regarding oral health care as a social justice issue instead of a luxury may provide the catalyst needed to improve the system and increase access to dental care in Oklahoma.

Keywords: oral health safety net, dental disparities, social justice, oral health equity, access to dental care

Chapter 1: Introduction

In the early twentieth century, American adults were resigned to losing their natural teeth by middle age. Just a generation later, attitudes had evolved, and Americans began to not only expect to keep most of their teeth for a lifetime, but also to experience oral health[1] and wellbeing (U.S. Department of Health and Human Services [USDHHS], 2000, p. vii). Remarkable advancements in biomedical research and technology following World War II had resulted in a better understanding of dental disease, widespread community water fluoridation, and effective new approaches to prevention and treatment (USDHHS, 2000, p. 3).

In 2000, the U.S. Surgeon General, David Satcher, M.D., brought oral health to the forefront of the health care discussion with the release of "Oral Health in America: A Report of the Surgeon General." It was the first ever Surgeon General's report on oral health (Satcher & Nottingham, 2017) and, at the time of this writing, remains the only such report on the topic[2]. In the report, Dr. Satcher acknowledged the improvement in the overall oral health of Americans, but also asserted that significant oral health disparities existed correlating with income, age, sex, race, ethnicity, and medical status (USDHHS, 2000, p. 10). Consequently, Dr. Satcher coined the phrase "silent epidemic" to describe the disproportionate impact of dental diseases on underserved and vulnerable populations[3] (USDHHS, 2000, p. vii). The report became a catalyst for oral health education, research, and advocacy efforts (Otto, 2017, p. 184).

Nearly two decades later, what Dr. Satcher referred to as "profound and consequential oral health disparities" (USDHHS, 2000, p. 283) persist significantly in Oklahoma and variably throughout the nation (Satcher & Nottingham, 2017). For

example, eighteen percent of low-income adults in Oklahoma self-report their overall oral health as poor, compared to four percent of middle-income adults and three percent of high-income adults (American Dental Association [ADA], n.d.-e). Forty percent of low-income Oklahomans report they avoid smiling due to the condition of their mouths and teeth, compared to 19 percent of middle-income adults and 15 percent of high-income adults (ADA, n.d.-e.). Regardless of age and income-level, minority racial/ethnic populations experience significant oral health disparities (Dye, Thornton-Evans, Li, & Iafolla, 2015; Fleming & Afful, 2018; Pew Charitable Trusts, 2016).

Dental disparities exist because members of certain population groups cannot access the dental care they need through the traditional, private practice-based delivery system due to financial, geographic, and demographic barriers to care (Bravemen & Gruskin, 2003; Centers for Disease Control and Prevention [CDC], 2011; Patrick et al., 2006). Public and private programs were created in an effort to meet the needs of disenfranchised individuals and, collectively, these components are referred to as the oral health safety net (Edelstein, 2010). The size and composition of oral health safety nets vary significantly between states, and even within the regions of a state, depending upon many factors, such as private and public funding, public policy (e.g., Medicaid qualifications, dental practice law), existence of academic dental institutions (i.e., dental schools), Medicaid participation and volunteerism levels among dental professionals, culture, and the number of access enhancement programs. In Oklahoma, the existing safety net of underfunded public dental health programs augmented by charitable, volunteer-driven endeavors is not enough to meet the needs of underserved and vulnerable populations, as evidenced by persistent dental disparities (Mouradian, 2006;

Smith, 2006). Fortunately, societal attitudes are changing. Historically, society viewed dental care as a commodity or luxury to be consumed by those able to afford it. But since the publication of the landmark U.S. Surgeon General's report, an increasing number of ethicists, dental and public health professionals, health care advocates, and members of the public are contemplating the individual and societal ramifications of dental disparities in terms of fairness, ethics, and social justice (Gostin & Powers, 2006). This shift in attitudes may provide a catalyst to advance systemic change.

Statement of Problem

The private dental practice system is inaccessible to various population segments, resulting in dental disparities which present ethical concerns in terms of social justice and the public good. An oral health safety net exists in Oklahoma to provide access to dental care for underserved populations, but in its current form it is not adequate to remedy these dental disparities. Oklahomans are doing without the dental treatment they need. Others are spending the night in line for free clinic events or months on waiting lists. Policymakers and other stakeholders must find a way to improve access to dental care in Oklahoma.

Aim, Scope, and Methods

The purpose of this study is to create a document of foundational background on the private dental practice system, the oral health safety net, and persistent dental disparities. This paper addresses two overarching questions. First, why is the oral health safety net necessary? Second, what is the composition and condition of the oral health safety net in Oklahoma? Analysis of solutions proposed to fix the broken oral health care delivery system is beyond the scope of this paper but could be addressed in future

research. This paper is intended to aid safety net components, nonprofits, funders, and policymakers as they work to improve access to dental care for underserved populations.

This study is supported in part by the Delta Dental of Oklahoma Foundation, via its employee tuition reimbursement program utilized by the author. I am the director of the Foundation, which is a major funder of many of the organizations that comprise the oral health safety net in Oklahoma. For this reason, I did not conduct interviews with individuals associated with the oral health safety net for the purposes of this thesis, but instead relied upon published sources. Because no research with human subjects was conducted, no Institutional Review Board approval was necessary.

An initial literature search was conducted using the following keywords: oral health safety net, dental safety net, access to dental care, barriers to dental care, dental disparities, oral health and social justice, and oral health inequity. Because the composition of the specific oral health safety net in Oklahoma is not currently documented in literature, I conducted Internet research to gather online resources from organizations and agencies associated with the safety net, including the Oklahoma State Department of Health, the Oklahoma Primary Care Association, the Delta Dental of Oklahoma Foundation, and the various safety net component organizations among others.

Overview

Chapter two provides a foundational background for understanding the private dental practice system parallel to which the oral health safety net operates. A basic understanding of the dental professional workforce, dental disease, treatments and costs,

as well as the dental profession, dental insurance, and public policy, is required to comprehend the complexity of the challenges intrinsic to the delivery of oral health care. Chapter three documents the composition of the oral health safety net in Oklahoma and explains how a lack of Medicaid funding places an insurmountable burden on charitable dental programs. Chapter four explores the dental disparities that result from an oral health delivery system that fails to meet the needs of all citizens. Chapter five presents possible solutions that could be addressed in future research.

Chapter 2: The Private Practice System

In effect, there are two separate oral health care systems in the United States, the private practice system and the oral health safety net (Institute of Medicine, 2011). To participate in the private practice system, a patient must have the ability to pay for treatment outright or dental insurance plus the ability to pay for out-of-pocket costs; proximity to a dentist and a means of transportation; the ability to take off from work during dental office hours; and, paid time off or the ability to afford lost wages. Patients who lack one or more of those resources are dependent upon the safety net for any possibility of treatment. This chapter will review the origins and development of the private practice system, including the dental profession and the interlinked dental insurance industry. Supplemental information, including oral health definitions, conditions, treatments, and costs, is found in Appendices A, B, C, and D.

History and Evolution of Dentistry

The Profession of Dentistry

References to tooth decay are found in ancient history. Hippocrates and Aristotle offered tooth extraction tips dating from 300 to 500 B.C. and a Sumerian text from 5000 B.C. named "tooth worms" as the underlying cause of dental decay (American Dental Association [ADA], n.d.-d.), a notion that would endure until proven false with the advent of microscopes in the 18th century (Otto, 2017). In the Middle Ages, the seed of dentistry as a profession was planted when the "Guild of Barbers" was established in France. Eventually, the organization bifurcated into two groups, surgeons trained to perform complex oral surgeries and lay barbers who were limited to routine hygiene services, shaving, bleeding, and dental extractions (ADA, n.d.-d.). The apprentice

system established by the Guild conveyed the mechanical aspects of dentistry from generation to generation (Otto, 2017).

In the 18th century, French and British practitioners advanced dentistry by integrating scientific principals and ethical concepts. Joseph Fox, a dental surgeon at Guy's Hospital in London, cautioned that "the sheer awfulness" of toothache pain "made sufferers uniquely vulnerable to exploitation" by charlatans who would seek to profit from that pain (Otto, 2017, p. 97). In 1723, Pierre Fauchard, a French surgeon, published *A Treatise on Teeth*, which established a comprehensive scientific and foundational system for the practice of dentistry. Fauchard, who had earlier used a microscope to disprove the ancient concept of worms causing tooth decay, is considered the Father of Modern Dentistry due to his significant contributions (ADA, n.d.-d.; Otto, 2017).

While the first medically-trained dentist immigrated from England to America in 1760, in the 18th century most American dentists (a self-proclaimed title at the time) traveled the land with tools in hand for scraping, drilling, and extracting, setting up temporary office in factories and taverns (Otto, 2017). From this group, which ranged from honest tooth extractors to outright charlatans, emerged Chapin Harris. Harris was born in New York just after the turn of the 19th century and was practicing the "dental arts" by the time he was twenty years old (Otto, 2017). Earnest and dedicated, Harris traveled the countryside, increasing his skills by gaining hands-on experience and reading the books of Fauchard, Fox, and other prominent European practitioners. Eventually settling down in Baltimore, Maryland, Harris would go on to edit and publish an American edition of Foxes' lectures, publish his own book (*The Dental Art)*,

establish dentistry's first scientific journal (the *American Journal of Dental Science)*, and serve as the journal's Baltimore editor for years (Otto, 2017). Most notably, Harris teamed up with Horace Hadyn, another well-established, medically-educated dentist of the time, and founded the world's first dental school, the Baltimore College of Dental Surgery (ADA, n.d.-d.; Otto, 2017). Originally, they sought to add dental instruction to the existing College of Medicine at the University of Maryland but were turned down by the physicians there. Known as "the historic rebuff," it is considered the genesis of the separation between the medical and dental sciences (Otto, 2017). Some have questioned the accuracy of the enduring story, but it is a matter of fact that dentistry evolved as a "separate and independent health service" (Otto, 2017, p. 105) as opposed to a specialty of medicine. Harris also attempted and failed to establish a "chair of dentistry" at a New York medical school before resorting to collecting financial contributions from colleagues and starting the independent dental school in 1840 (Otto, 2017).

With rare exceptions, such as the establishment of a dental department within the medical school at Harvard University in 1867, dental education and the dental field continue to be separate from medical education and practice to this day (Otto, 2017). This divergence is particularly consequential in terms of public health. According to Otto (2017),

> the profession would remain focused upon the surgical procedures needed to treat tooth decay and other symptoms of oral disease. Unlike physicians, who would maintain hospital affiliations, most dentists would build private practices for the delivery of their services…. Far fewer dentists would concern themselves with social medicine, researching wider patterns of disease, or the delivery of oral health care across populations. Far fewer would work in laboratories, researching the microscopic causes and conditions underlying health and disease. (p. 108)

Also, with a separate industry came a separate financing system, including the omission of dental treatment from public and private medical insurance plans (Otto, 2017). With the formation of the American Dental Association in 1859, dentists began defending "the standards and licensing of their profession as well as their professional autonomy" (Otto, 2017, p. 108). Near the close of the 19th century, the discovery that dental decay is caused by bacteria ushered in a world-wide interest in oral hygiene and the new concept of daily toothbrushing and flossing. At the turn of the century, dental x-rays and orthodontics were established (ADA, n.d.-d.). The 20th century brought rapid and dynamic innovation in terms of both techniques and technology. Dental treatment became more comfortable with the advent of Novocain local anesthesia, fully reclining dental chairs, the four-handed dentistry technique, lasers for soft-tissue work, improved instruments and materials, and much more (ADA, n.d.-d.). The focus of dentistry expanded from dental disease treatment (fillings, crowns, extractions) to dental disease prevention with the establishment of the role of the dental hygienist, the invention of the nylon toothbrush and fluoride toothpaste, and the introduction of community water fluoridation. Mid-century, Congress established National Institute of Dental Research (later renamed the National Institute of Dental and Craniofacial Research) (ADA, n.d.-d.). Before the turn of the 21st century, the era of dental aesthetics was in full force with increasing demand for expensive cosmetic treatments like veneers, implants, gum contouring, orthodontics, and teeth bleaching (Otto, 2017).

The Business of Dentistry

In the United States, the practice of dentistry is both profession and business. Like all businesses, dentistry is subject to the advantages and disadvantages of free

market principles (Wendling, 2010). The free market system affords dentists the ability to establish a dental practice wherever they choose and in the way they choose. For example, a dentist can locate near and accommodate lower socio-economic status populations by keeping overhead expenses low or locate in an upper-class area and cater to higher socio-economic patients by utilizing the latest technology (Cole et al., 2015; Wendling, 2010). The independence of being one's own boss, the flexibility of setting one's own hours, and the entrepreneurial challenge and opportunity are factors that draw the interest of some to dentistry (Cole et al., 2015). The dentist/owner can reap the reward of profits, though that comes with the financial risk inherent to any business venture (Wendling, 2010).

Proponents of the free market aspect of the business of dentistry claim that competition for customers, in this case patients, requires dental practices to provide excellent customer service to succeed. It also drives innovation. Detractors point out that this system only works for the portion of the population with the resources (i.e., dental insurance, out-of-pocket cash, and available time off during dental office hours) required to participate. Those who live in geographic areas without enough demand to support a dental practice are also left unserved (Wendling, 2010).

The traditional model of dentist-owned private practice has dramatically shifted from dominantly solo practice (in which an individual dentist owns and operates the practice and sees all patients) to group practice (in which dentists still own and operate the business but do so in a legal partnership, sharing a building, expenses, and risks). In 1985, 75 percent of dentists were solo practitioners and by 2010, only 60 percent were in solo practice (Wendling, 2010). By 2016 the national average was less than 30

percent with 30.6 percent of Oklahoma dentists in solo practice (American Dental Association, 2018a). Reasons that more and more dentists opt to participate in group practice include cost-efficiency and the ability to offer extended office hours (Wendling, 2010). In any case, the key is that the practices are completely owned, operated, and controlled by dentists.

Practice ownership is a major and contentious issue in the business of dentistry today. In recent years, dental support organizations (DSOs) have emerged in the industry. These companies (also known as dental service organizations, dental management service organizations, group dental organizations, franchises, and corporate dentistry) own dental practices and employ dentists. Laws in many states (including Oklahoma) prohibit the ownership of dental practices by non-dentists, so DSOs enter into a contractual agreement with dentists wherein the practice is divided into two parts: A professional corporation comprised of the dentists controls all clinical aspects, and a management corporation controls all major non-professional aspects (Guay, Warren, Starkel, & Vujicic, 2014). Even in this configuration, the dentists answer to the management company to a varying degree, depending upon the contract. Examples of DSO-managed group practices in Oklahoma include Aspen Dental, Gentle Dental, and Heartland Dental (Association of Dental Support Organizations, n.d.).

Some consider DSOs an existential threat to the traditional private practice and an intrusion into the dentist-patient relationship. They claim the profit motive of DSOs can result in incentivized over-treatment of patients, particularly those on Medicaid, to maximize profits (Cole, 2015). However, proponents of DSOs claim they are good for dentists because they remove the business management burden, allowing dentists to

concentrate on patients. DSOs also provide an alternative to purchasing a private practice, which costs on average $300,000 to $500,000, a feat made more difficult by enormous student loan debt (Cole, 2015). Proponents claim DSOs are also good for patients because DSO-managed practices are more cost-efficient and productive, which, by extension, decreases costs and increases the number of patients served (Gesko & Bailit, 2017). Currently, the percentage of dentists affiliated with a DSO-affiliated practice is only 8.3 percent nationally (8.8 percent in Oklahoma), meaning more than 90 percent of dentists own their practices (ADA, 2018a). In contrast, 2016 marked the first year in which less than half of medical doctors own all or part of their practices (Kane, 2017). At the current trend, it would take until 2090 for dentistry to pass the 50 percent mark, but most experts agree that the rate at which dentists opt for DSO arrangements is likely to increase (Vujicic, 2017; Cole, 2015). Some experts point to debt load (the average student loan debt for 2017 dental school graduates was $287,331), increasing administrative burden, and lifestyle priorities as drivers toward corporate dentistry (American Dental Education Association, n.d.; Vujicic, 2017).

The Workforce of Dentistry

The dental professional workforce is comprised of dentists, specialists, and *dental auxiliaries* (also known as *allied dental professionals*), which includes dental assistants, dental hygienists, dental therapists, and community dental health coordinators. It is universally held that dentists are the head of the dental team, but the degree to which dental auxiliary must be supervised by dentists varies among states. The American Dental Association defines dentists as doctors of oral health (ADA, n.d.-b.). In addition to the teeth and gums, the dentist's realm includes the tongue, salivary

glands, and the muscles and nervous system of the head, neck, and jaw (ADA, n.d.-b.). Dentists may receive a Doctor of Dental Medicine (D.M.D.) degree or a Doctor of Dental Surgery (D.D.S.) degree, the only difference being what the educational institution chooses to call the degree. Some dentists continue their educations to become specialists. The ADA recognizes nine specialties, including dental public health, endodontics, oral and maxillofacial pathology, oral and maxillofacial radiology, oral and maxillofacial surgery, orthodontics and dentofacial orthopedics, pediatric dentistry, periodontics, and prosthodontics (ADA, n.d.-b.).

Dental assisting professional education ranges from on the job training to formal accredited associate degree programs. Many states, including Oklahoma, offer the designation of Expanded Duty Dental Assistant to assistants who complete extra training (Baker, Langelier, Moore, & Daman, 2015). In addition to assisting dentists during treatment, dental assistants may also do a wide range of activities depending on training, certification, and the scope of practice defined by state dental law. Tasks may include sterilizing instruments and equipment, serving as infection control officer, taking radiographs, and making teeth impressions among other clinical and administrative activities (ADA, n.d.-a; Baker, Langelier, Moore, & Daman, 2015). Nationwide, dental assistants are more racially and ethnically diverse than dentists (Baker, Langelier, Moore, & Daman, 2015).

A dental hygienist is an oral health professional who has graduated from an accredited dental hygiene program and is licensed to "provide education, assessment, research, administrative, diagnostic, preventive, and therapeutic services that support overall health through the promotion of optimal oral health" (American Dental

Hygienists' Association, 2017, p. 34). Dental hygienists are the primary providers of preventive care, such as cleaning and polishing teeth, scaling and root planing, placing sealants, and applying fluoride treatments, allowing the dentists' time to be reserved for treatment only they can provide. Dental hygienists are well-positioned to impact the oral health literacy and preventive treatment needs of underserved and vulnerable populations because of the dental hygiene skill set and the lower cost of labor, relative to dentist labor cost (Langelier, Baker, & Continelli, 2016). However, scope of practice law significantly impacts the degree to which hygienists can be used in public health settings (e.g., school-based oral health programs, free dental clinics, county and state health departments, long-term care facilities) in which utilizing the most cost-efficient labor is vital (Otto, 2017). The legal scope of practice for dental hygienists varies by state. In Oklahoma, dental hygienists must work under the *general supervision* of a dentist. That means a dentist must examine a patient prior to a hygienist performing cleanings or other preventive treatment, though the dentist does not have to be present during the cleaning. While this works in a private practice setting, it is not practical for a public health setting, such as a school-based sealant program, because of the additional cost incurred by having a dentist examine the students before sealants can be applied. Oklahoma dental law has a very narrow exception to this "prior exam" rule that allows hygienists to apply dental sealants and fluoride varnish in certain public health settings, such as school-based sealant programs (State Dental Act, 2017).

Dental therapists are midlevel practitioners that are analogous with physician assistants in medicine. They are a standard part of the dental team in other countries, such as Australia, Canada, and the United Kingdom, but the United States has been

slow to adopt the position (Phillips, Shaefer, Aksu, & Lapidos, 2016). In 2004, Alaska was the first state to adopt a midlevel provider model, followed by Minnesota, Maine, Vermont, Arizona, and Native American tribes in Washington and Oregon (Larkin, 2017). Dental therapists require less training and receive lower salaries than dentists but, unlike dental hygienists, are allowed to perform irreversible procedures such as fillings, simple extractions, and temporary crowns. Proponents like the Pew Charitable Trusts and the Kellogg Foundation promote dental therapists as a way to safely and effectively increase access to dental care for underserved populations (Pew Charitable Trusts, 2014). The American Dental Association (2017) opposes the dental therapist model and asserts that data do not support the claims that "new models that replicate what dentists already do well have increased access to care at a lower cost" (para. 1). The ADA believes underserved patients need to be connected to and treated by dentists. In an effort to improve access to dental care for underserved populations the ADA created and launched the Community Dental Health Coordinator (CDHC) program in 2012 (ADA, n.d.-f.). CDHCs are community health workers who serve their communities with oral health education, prevention, care coordination, and patient navigation, to help connect people to the best dental resource for their needs (ADA, n.d.-a.). CDHCs, often members of the underserved communities or populations they serve, are trained to be culturally competent as they address barriers that go beyond financial means, including language, geographic, educational, and cultural barriers (ADA, 2012b). While Oklahoma does not license dental therapists, it is one of 21 states with practicing CDHCs (ADA, n.d.-f.).

History and Evolution of Private Dental Coverage

In the mid-1930s, the Franklin Delano Roosevelt administration put forward the concept of a national system of health care benefits, referred to by some as *state medicine*, which was opposed by both organized medicine and dentistry (Otto, 2016, p. 188). While the anti-communism and anti-socialism sentiments that followed World War II ended talks of state-sponsored health care, the concept of private medical insurance emerged (Otto, 2016). However, the fringe benefit subsequently offered by private employers did not include dental coverage. In the early 1950s, a young California dentist named Max Schoen was dreaming of a way to make dental care accessible to more people, particularly low-income and minority populations, and in a manner free of stigma (Otto, 2016; Schoen, 1991). Though he had served his country in World War II, involvement with a civil rights organization resulted in him being called to appear before the House Committee on Un-American Activities. As one of the questioning Congressmen put it:

> …I am glad to see you are anxious to protect the rights of the minority, in other words, the Negroes and the Jewish people and the poor whites. But of course, that is the communist line, to appeal to that group, and we understand that. Now give us your thoughts on investigating the Communist Party, please. (Otto, 2016, p. 186)

Schoen repeatedly declined to answer based on his Fifth Amendment rights and was eventually excused and allowed to return to his private practice. Three years later he pioneered a third-party payment system – the early form of dental benefits – which would serve as a "democratizing agent, bringing quality-control measures and fee schedules to dentistry and making services more accessible to millions" (Otto, 2016, p. 194).

It was 1954 when serendipity connected Schoen to the organization that had the vehicle to transport his dental benefits concept to reality, as he recalled in his 1991 acceptance speech for the John W. Knutson Distinguished Service Award:

> …Through one of my lab technicians, who lived next door to a labor attorney, I learned that the UCLA Institute of Industrial Relations has a subcommittee which was considering the feasibility of dental care as an addition to fringe benefits. Apparently, the committee had been told by insurance company and dental society representatives that it couldn't be done. I arranged to get invited to one of the meetings and said I was sure it could be done….Several representatives of the West Coast longshoremen were present and, immediately after the meeting, told me they thought they might be ready to introduce the idea. (Schoen, 1991, p.181)

The West Coast branch of the International Longshoremen's and Warehousemen's Union was looking for a way to use a surplus of $750,000 to establish a dental plan. After weeks of research and analysis, Schoen emerged with a plan that provided comprehensive dental benefits to all children of union members up to age 15. The Union enthusiastically adopted the plan and launched a pilot program that called for the establishment of a "prepaid group practice," a concept that did not exist at the time, in the Los Angeles harbor area to provide the services (Otto, 2016, p. 188). Upon winning the bid process, Dr. Schoen created a practice that also accomplished another long-standing personal goal and another first in dentistry: In December 1954, he opened a ten-chair dental office with a single, non-segregated waiting room manned by a racially diverse team of salaried/partner dentists (Schoeb, 1991).

Schoen experimented with fee schedules, capitated fees, and team approaches, in what amounted to a radical revisioning of the traditional fee-for-service model, with hopes of developing a model that could be expanded to serve adults and underserved populations (Otto, 2016, p. 189). There was a significant push back against the concept from the conservative side of organized dentistry. Dental association publications

carried editorials characterized Schoen's endeavors as communist and threatening to the livelihoods of dentists (Otto, 2016). But the delivery of services was only half of the equation. Some entity had to serve as the administrator and third-party payer. Schoen credits Goldie Krantz of the ILWU-PMA Welfare Fund with convincing "the reluctant dental associations to establish service organizations for the fee-for-service portion of the program as an alternative to the traditional insurance companies who said they couldn't or wouldn't handle dentistry" (Schoen, 1991, p. 182). The original dental service organizations became Delta Dental of California, Delta Dental of Oregon, and Delta Dental of Washington. These organizations developed dental insurance programs for other employers to offer to their employees and, in 1966, the Delta Dental Plans Association (DDPA) was created to "coordinate dental insurance for companies with employees in multiple states" (Delta Dental Plans Association [DDPA], n.d.). Today, the Association is an umbrella for 39 independent Delta Dental member companies which operate in all 50 states and Puerto Rico (DDPA, n.d.). Delta Dental member companies provide dental benefits exclusively, whereas other insurance companies, such as Blue Cross Blue Shield, MetLife, and Aetna, offer dental as an option alongside their health insurance (Delta Dental of Oklahoma, n.d.).

Though there are currently dozens of dental benefits companies, Delta Dental dominates the industry. For example, Delta Dental of California covers 40 percent of all dentally insured individuals in California, Metropolitan Life Insurance Company has the second highest market share at only eight percent, and the remaining market share is fragmented among the 50 other dental insurers in the state (Vujicic, Gupta, & Nasseh, 2018). Some experts question whether the moderate concentration could "result in

higher premiums for consumers or lower reimbursement for providers" (Vujicic et al., 2018, p. 75), but published research does not support that hypothesis (Vujicic et al., 2018). Even when a medical insurance company offers dental benefits, the policies are completely segregated and differently structured. While some experts claim it would be more affordable if medical insurance included basic dentistry (Spector, 2017), others claim that dental coverage must be handled separately from medical because the "nature of risk" and the "deferability of care" are fundamentally different from medical care (Spector, 2017, para. 10) and that if dental benefits were more inclusive, the cost of premiums would be unaffordable (Spector, 2017). With a few exceptions, Delta Dental member companies are 501(c)(4) not-for-profit corporations. This means the companies are tax-exempt because they are not organized for the purpose of profit but are instead operated to "promote social welfare" (Internal Revenue Service, 2018). In 2016, Delta Dental member companies contributed more than $69 million to dental care and oral health education programs nationwide (DDPA, n.d.). In Oklahoma, Delta Dental of Oklahoma achieves its not-for-profit mission in a two-pronged approach: by providing dental benefits plans and services to employers and individuals and by donating 50 percent of its annual net contribution to reserves (on a three-year rolling average) to its Foundation (Delta Dental of Oklahoma Foundation, n.d.-b.). The Delta Dental of Oklahoma Foundation then uses the funding to support dental education and dental care clinics and programs that serve the public, with an emphasis on underserved and vulnerable populations (Delta Dental of Oklahoma Foundation, n.d.-b.).

The term dental *insurance* is widely used, but inaccurate. Traditional insurance, such as home or auto, is intended to protect the consumer from large or catastrophic loss

and is not used unless an incident occurs. With traditional insurance, the consumer pays an annual premium regardless of whether the insurance policy is used. If there is an incident, the consumer pays a deductible (i.e., the amount that must be paid before the insurance company will pay anything), which, depending on the policy, ranges from a few hundred dollars to several thousand dollars. The insurance company then covers the balance of the loss (Amadeo, 2018; "Do you need dental," 2012; Spector, 2017). Similarly, health insurance is intended to protect the consumer from catastrophic loss, but it is also designed to allow people to get medical treatment when they need it. As with traditional insurance, the consumer pays a premium and a deductible, but after the deductible is met, the patient pays co-payments for office visits and prescriptions (e.g., $20) and co-insurance for treatment (e.g., 20 percent of the cost of services). These expenses are called *out-of-pocket costs* and are designed to provide access to necessary treatment while deterring overutilization of health care services. However, the Affordable Care Act limits the annual maximum out-of-pocket cost for individuals to $6,600 for individuals and $13,200 for families (Amadeo, 2018). Once the patient has paid the maximum out-of-pocket costs, the health insurer covers treatment costs at 100 percent for the remainder of the year (Amadeo, 2018; "Do you need dental," 2012; Spector, 2017).

Dental coverage is different. Instead of an out-of-pocket maximum the patient pays, dental plans have an annual maximum that the dental benefits company pays, which is generally $1,000 to $2,500 ("Do you need dental," 2012; Spector, 2017). Typical plans pay 80 percent of the costs of basic procedures (extractions, fillings, root canals) and 50 percent of the costs of major procedures (crowns, bridges), leaving the

balance of the cost as an out-of-pocket expense for the patient (Walton, 2018). Once the annual maximum has been paid by the benefits company, the patient is then responsible for 100 percent of the cost of treatment until the start of the next benefit year. To encourage patients to get preventive care (such as teeth cleaning), many plans cover it at 100 percent and do not apply the cost toward the patient's maximum (Walton, 2018). Industry professionals say this structure is necessary because more extensive coverage would require higher premiums than consumers are willing to pay ("Do you need dental," 2012; Spector, 2017). Therefore, a more accurate term is dental *benefits* because the coverage is designed to help patients afford dental care by sharing the cost ("Do you need dental," 2012; Spector, 2017; Vujicic, 2016).

Dental coverage makes a significant difference in dental care-seeking behavior. In 2015, 52 percent of the U.S. community (civilian, noninstitutionalized) population had private dental coverage, 19 percent had public dental coverage, and 29 percent had no dental coverage (Manski & Rohde, 2017, p. 1). Of those with private dental coverage, 56 percent had a dental visit in 2015, but only 26 of dentally-uninsured individuals visited the dentist that year (Manski & Rohde, 2017, p. 1). However, it should also be noted that even individuals with private dental coverage name cost as the top reason for avoiding or delaying dental care (Vujicic, 2016), and that people with insurance, even if they are unable to afford the co-payment, do not qualify for assistance from most free dental clinics and programs.

Chapter 3: Oklahoma's Oral Health Safety Net

The oral health safety net is not a formally organized system, but instead a collection of highly diverse components, including charitable, community, and faith-based programs, government programs and policies, and academic institutions, as well as the dental professionals who donate their services through those programs and in the anonymity of their private practices. The one thing the components have in common is the mission to help meet the oral health needs of underserved and vulnerable populations. The components that comprise the oral health safety net in Oklahoma can be organized in a variety of ways. This paper classifies resources based on the cost to the patient, therefore they are primarily divided into two groups, *low-cost* and *free*. The range of treatment available varies significantly between safety net components. The types of services offered by programs and clinics are determined by mission, model, funding, type of equipment and tools, and volunteer/paid providers available. (See Appendix C for definitions and costs of dental treatments.) Also, the demand for programs offering free services far exceeds its supply (Delta Dental of Oklahoma Foundation, 2018). Therefore, it is not uncommon for a patient to have to utilize more than one safety net component to get his or her dental needs met. For example, a patient may receive extractions in a free clinic and then be referred to a low-cost clinic or a dental care facilitation program for dentures.

Table 1. Components of the oral health safety net in Oklahoma

- Medicare and Medicaid (SoonerCare)
- Hospital Emergency Departments (EDs)
- Low-Cost Dental Clinics
    - Federally Qualified Health Centers (FQHCs)/Community Health Centers (CHCs)
    - Non-FQHC Charitable Clinics
    - Academic Dental Institutions (ADIs)
- Free Dental Clinics and Programs
    - Mobile/Portable Dental Clinics
    - Free Dental Clinics (Fixed Clinics)
    - Facilitation Programs (Non-clinical)
    - Dental Practices
    - Health Departments

Note. Adapted from "Improving Access to Oral Health Care for Vulnerable and Underserved Populations," by the Institute of Medicine, 2011, pp. 162-172. Copyright National Academy of Sciences.

Medicare and Medicaid

Medicare is the federal health insurance program for people age 65 or older, people under age 65 with certain disabilities, and people with End-Stage Renal Disease, who are either U.S. citizens or permanent legal residents for at least five years (American Association of Retired Persons [AARP], 2016). Regardless of income, individuals are eligible to enroll in Medicare Part A (Hospital Insurance) and Medicare Part B (Medical Insurance) upon turning 65 (AARP, 2016). Medicare is funded with federal dollars and is generally the same throughout the U.S. (Oklahoma Health Care Authority [OHCA], 2017). Dental care was specifically and completely excluded from Medicare coverage by statute from the beginning, but in 1980, Congress amended the dental exclusion to make an exception for "inpatient hospital services when the dental procedure itself made hospitalization necessary" (Centers for Medicare & Medicaid Services, 2013, para. 2 and 5). Furthermore, unless a dental procedure is a necessary and integral part of treating a non-dental condition (e.g., jaw reconstruction following accidental injury, teeth extractions in preparation for radiation treatment, or dental

examination before renal or heart valve transplants), it is not covered by Medicare. Low-income Medicare recipients may also qualify to enroll in Medicaid, and Medicaid may cover some or all of the recipients' Medicare premiums and cost sharing expenses (OHCA, n.d.-b.).

Medicaid was created as Title XIX of the Social Security Act in 1965 and is a public health coverage program for qualifying low-income individuals of every age (OHCA, 2017). The Children's Health Insurance Program (CHIP) was established in 1997 and provides federal matching funds to states to provide health coverage to children from households with income too high to qualify for Medicaid but too low to afford private coverage (OHCA, 2017). Both programs are jointly funded by the federal and state governments and are optional, but currently all 50 states participate.

Federal matching funds are not uniform, but instead are calculated on a state by state basis using a statutory formula called the Federal Medical Assistance Percentage (FMAP). The FMAP is based on the average per capita income of each state compared to the national average (with a minimum of 50 percent) and is adjusted on a three-year cycle (OHCA, 2017). This means the amount of matching funds is based on the status of the state economy, so that states with stronger economies receive less federal funding than states with weaker economies. The concept being, a state with a stronger economy can afford to cover more of its residents' health costs. According to the Oklahoma Health Care Authority (2017), since Oklahoma's economy has been "doing well comparatively" in recent years, the state's FMAP has been on a steady decline, resulting in "another reduction in federal matching funds" in fiscal year 2017 (p. 17). OHCA (2017) cites this as a "major factor in OHCA's budget woes" (p. 17) because the

Oklahoma Legislature did not increase SoonerCare state funding to offset the federal reductions. The average FMAP is 57 percent; Oklahoma's FMAP was 59.9 percent for fiscal year 2017. During FY 2017, the federal government matched each dollar spent by SoonerCare with $1.51 (OHCA, 2017, p. 17).

To qualify for federal matching funds, states must cover the following groups: pregnant women; children 18 and younger with qualifying family income (at a minimum, those below 100 percent of the Federal Poverty Level); parents below cash-assistance eligibility levels; and individuals who are aged, blind, or disabled and receive Supplemental Security Income (SSI) (OHCA, 2016, p. 29). Beyond the federal mandates, states have the latitude to determine eligibility income limits and any additional coverage or services offered, so depth of coverage varies significantly between states.

In Oklahoma, Medicaid and CHIP operate as a combined program called SoonerCare, which is administered by the Oklahoma Health Care Authority (OHCA, 2018b). SoonerCare served 356,477 adults and 631,531 children in FY 2017 (approximately 25 percent of the state's population) with dental services valued at more than $117 million (OHCA, 2017, p. 27), making it the single largest component of the oral health safety net. To qualify for SoonerCare, an individual must meet certain residency and citizenship, income, and categorical requirements. The person must be an Oklahoma resident and either a U.S. citizen or a "qualified alien." Legal immigrants are "barred from the program for five years" upon becoming Oklahoma residents (OHCA, n.d.-a.). For children (up to 21 years of age) to qualify for SoonerCare, their household income (based on a family of four) cannot exceed $52,716. Individuals with disabilities

of all ages who qualify for Supplemental Security Income also qualify for SoonerCare. The only other adults who qualify for SoonerCare are pregnant women with household incomes (based on a family of four) under $33,384 and adult caretakers (parents or legal guardians) of minor children with household incomes under $11,292 (OHCA, 2018a). Initially, the Affordable Care Act (ACA) required states to expand Medicaid to make it available to people with incomes too high to qualify for Medicaid but too low to qualify for the ACA subsidies to assist them to purchase a plan through a health insurance Marketplace. However, a 2012 U.S. Supreme Court decision held that the ACA could not compel states to expand Medicaid (Berliner, 2013). Once this requirement was blocked by the Supreme Court, states could choose not to expand Medicaid, leaving these individuals in a coverage gap. As of this writing, Oklahoma is one of seventeen states that have not expanded Medicaid (Antonisse, Garfield, Rudowitz, & Artiga, 2018). Accordingly, children and adults from households with income higher than the SoonerCare/CHIP eligibility income requirements and children and adults who are not U.S. citizens or qualified aliens, do not qualify for SoonerCare and must rely on other components of the oral health safety net for dental care.

For children under 21, SoonerCare covers two cleanings per year, x-rays, fillings, crowns, and other treatment deemed "medically necessary" with no out-of-pocket costs (i.e., premiums, co-payments) for parents (OHCA, 2018c). Even when SoonerCare removes the financial barrier, the lack of access to a SoonerCare dentist can still prevent children from receiving care, as discussed in the Barriers to Dental Care section in chapter four. The child utilization rate for SoonerCare dental benefits in 2017 was 47 percent, up from 44 percent in 2011 (OHCA, 2012). While a positive trend,

considering the American Academy of Pediatric Dentistry (n.d.) recommends dental check-ups every six months for children, a majority of SoonerCare eligible children remain underserved.

Emergency extraction is the only dental benefit available for adults on SoonerCare. That means SoonerCare adults must rely on the charitable components of the safety net for preventive treatment, restorative care, and dentures (see Appendix C for definitions of treatments). Charitable free clinics and programs cannot meet the high demand for services, resulting in long lines, waiting lists, and lack of treatment.

Hospital Emergency Departments

Another component that stands apart in the safety net is hospital emergency departments (EDs), primarily because in Oklahoma (as in most states) there are no hospital-based dental clinics. According to an analysis of data from the 2015 Nationwide Emergency Department Sample of the Healthcare Cost and Utilization Project, the number of emergency department (ED) visits for non-traumatic dental conditions was 2.2 million and the amount spent on those visits was $2 billion (American Dental Association, 2018c). That makes EDs a de facto, but very ineffective and very expensive, component of the oral health safety net. EDs are not equipped to treat dental conditions. The most they can offer are anti-biotics and pain medication intended to tide the patient over until he or she can visit a dentist (Wall & Vujicic, 2015). Often the patient returns in a week or so, in the same condition, due to being unable to access dental treatment.

Yet over the past decade, visits to EDs for "dental conditions have doubled, with young adults (of all income levels) and low-income adults having the highest visit rates" (Vijicic, Buchmueller, & Klein, 2016). A study comparing Oklahoma, a state with minimal Medicaid dental benefit, and New York, a state with comprehensive Medicaid benefit, showed that Oklahomans were more than four times more likely than New Yorkers to visit an ED for dental needs (Surdu, Langelier, & Moore, 2016). Patients know that they must have payment on hand when they visit a dental office, but they can be seen in emergency departments without expectation of immediate payment. However, when the patient is unable to pay the hospital bill, it impacts the hospital as bad debt uncompensated care which is ultimately "cost shifted to insurance companies, self-insured businesses, and others who pay for health care services" (Oklahoma Hospital Association, n.d.).

Low-Cost Dental Clinics

Low-cost clinics are nonprofit or academic entities that provide services at reduced rates or according to income-based sliding fee scales. Low-cost clinics receive funding from a variety of sources in order to offset the cost of providing services at lower rates. Low-cost clinics rely on paid providers, but some augment their workforce with volunteers. Low-cost clinics give patients with limited means the opportunity to pay for their dental care, which provides the patients with dignity and the clinics with income to help increase sustainability. There are three types of low-cost clinics: Federally Qualified Health Centers (FQHCs), non-FQHC charitable clinics, and academic dental institutions (ADIs).

Federally Qualified Health Centers

Federally Qualified Health Centers (FQHCs), also known as Community Health Centers (CHCs), combine the resources of local communities with federal funding to create sustainable clinics in high need communities or for high-risk populations (National Association of Community Health Centers [NACHC], 2018). FQHCs began more than fifty years ago as a part of President Lyndon B. Johnson's "War on Poverty" with the purpose to "provide affordable, high quality, comprehensive primary care to medically underserved populations, regardless of their insurance status or ability to pay for services" (NACHC, 2018). While FQHCs are private, 501(c)(3) nonprofit health care organizations, they are defined by Medicare and Medicaid statutes and are required to meet strict requirements, including being governed by a patient-majority community board (Health Resources and Services Administration [HRSA], n.d.). Also, the centers must provide primary care, mental and behavioral health care, pharmacy services, and oral health services as well as supportive services, including translation, transportation, education, and case management (HRSA, n.d.). While not free clinics, FQHCs are required to provide care regardless of a patient's ability to pay and charge fees based on a sliding fee scale for patients below 200 percent of the federal poverty level [FPL] (HRSA, n.d.). FQHCs can serve patients above 200 percent FPL at full fee and accept private insurance. However, 92 percent of patients nationwide are at or below 200 percent FPL and 83 percent are publicly insured or uninsured (NACHC, 2018). To help offset the costs of uncompensated care and supporting services, FQHCs receive federal funds through the HRSA (Health Resources and Services Administration) Health Center Program, as authorized under section 330 of the Public Health Service Act (NACHC,

2018). They also receive a higher Medicare and Medicaid reimbursement rate (called the Prospective Payment System), medical malpractice coverage under the Federal Tort Claims Act, and free vaccines for uninsured and underinsured children (HRSA, n.d.). An FQHC organization may have multiple satellite clinic sites. In Oklahoma, there are 20 FQHC organizations and a total of 98 clinic sites (see Appendix F for details). Not all FQHC clinics have dental operatories onsite; some transport patients to the main clinic or contract with local dentists to provide services. Eighty percent of Oklahoma's FQHCs provide dental services on-site, the same as the national average (NACHC, 2018). Eighty-four percent of the population is located within 30 minutes of an FQHC (see Appendix G for map). Oklahoma FQHCs served 220,000 patients in 2016. Ninety-three percent of those patients were at or below 200 percent of the federal poverty level and 31 percent were uninsured (Oklahoma Primary Care Association, 2017).

Non-FQHC Low-Cost Clinics

Good Shepherd Community Clinic of Ardmore and NSO Dental Clinic are non-FQHC low-cost clinics. Good Shepherd Community Clinic was established in Ardmore, Oklahoma, in 1996 as an all-volunteer, free clinic to serve residents of Carter, Love, Marshall, Murray and Johnston counties who lacked access to health care, dental care, vision care, and medications. Today the clinic is a low-cost charitable clinic manned by staff and volunteers. Annually, more than 3,000 underserved patients receive services on a sliding fee scale. The clinic is funded by private donations (Good Shepherd Community Clinic, n.d.). The NSO Dental Clinic in Oklahoma City provides comprehensive dental care at discounted rates (see sample fees in Appendix D). The clinic is one of many programs administered by the Neighborhood Services

Organization, a nonprofit established in 1920 to serve the needs of impoverished families in Oklahoma City (Neighborhood Services Organization, n.d.). The clinic is funded by private donations and is a United Way Partner Agency.

Academic Dental Institutions

Academic Dental Institutions (ADIs) include dental schools, which educate dentists, advanced practitioners, and specialists, and allied dental programs, which educate dental hygienists, assistants, and other dental auxiliary positions. Not only do ADIs provide the foundation of America's oral health field by providing research and education for its future workforce, but they also play a key role in the oral health safety net by providing low-cost and donated dental care for a wide variety of underserved populations ("Addressing Healthcare Workforce Issues," 2008, p. 52).

The University of Oklahoma College of Dentistry (OUCOD) in Oklahoma City is one of the 65 dental schools located in 37 U.S. states. During the 2017-18 academic year, 2,072 new patients were screened, and 24,370 patient visits were conducted at the dental school's various clinics (ADA, 2018d). Because of its value to both the dental workforce and the oral health safety net in Oklahoma, it is worth being cognizant of the tumultuous beginnings and precarious present situation of the College. Dreams of a state dental school precede statehood. In 1906, Oklahoma County Dental Society members began an attempt to raise funds for what would be named the Oklahoma City Dental College. When the financial crisis of 1907 halted the effort, the nascent dental school was handed over to Epworth University, a college founded in 1904 by two Methodist church congregations on land donated by the city. Epworth chartered a college of medicine in 1907 and followed this with a college of dentistry and a

pharmacy program in 1908. But when the state legislature failed to support the medical and dental colleges as a state institution, and in-fighting broke out between the two founding (and funding) churches, the parent university struggled. By 1910, the non-lucrative medical school merged with University of Oklahoma College of Medicine and the unprofitable dental and pharmacy schools were eliminated. Though many would broach the subject, a serious attempt to create a state dental college would not gain traction until the late 1950s, after a U.S. Public Health Survey and other sources began to warn of an impending dentist shortage.

With strong support from the Oklahoma State Dental Association (now the Oklahoma Dental Association), legislation was passed in 1961 that approved the establishment of a dental school to be located on the Oklahoma City campus of the OU College of Medicine. But by the time the regents could present their cost estimate and appropriations request in 1963, support for the dental school was ensnared in debate and the state funding bills were defeated. Critics, including many dentists, questioned the reliability of the federal data that projected a need for more dentists in the near future. They conjectured that fewer dentists would be needed than estimated due to the increasing use of dental auxiliary (such as dental hygienists) and new technologies that improve dentists' efficiency. Other opponents claimed fluoridation, sealants, and other "emerging material technologies" would soon "dramatically reduce dental maladies, rendering an Oklahoma dental school the obsolete equivalent of a buggy whip factory" (Curtis, 2011, p. 56). Proponents pointed to the number of Oklahomans who were leaving the state to be educated in other dental schools and not returning to Oklahoma, and the fact that Oklahoma's gain of new dentists "barely offset" its loss due to attrition.

Some also asserted that a dental school would "relieve our state of the stigma as backward in health education" and would "increase appreciation of dental service" (Curtis, 2011, p. 43).

In his book, *Smile, Oklahoma!: The Story of the University of Oklahoma College of Dentistry*, Curtis (2011) expounds on the long and arduous process required to finally bring about a state dental school, stating: "Progress was terribly slow also because the bureaucratic process had to run its course on three fronts: health science, education, and politics" (p. 40). Finally, in 1972, the University of Oklahoma College of Dentistry accepted its first class. The existing five-story OU College of Dentistry building was dedicated on April 25, 1976, just in time for the first graduating class to take their state licensing exam there. However, that was far from the last of the battles to be faced by the College. In 1987, amidst the state's oil bust and the emergent perception of there being too many dentists, Governor Henry Bellmon called for the closing of the College of Dentistry. House Bill 1325 of the 1988 Legislature called the College of Dentistry "an unprofitable and unnecessary part of this state's higher education system" (Curtis, 2011, p. 107). A report released by the office of the provost in September 1988 presented a compelling multi-faceted argument against closing the College of Dentistry, including financial, contractual, and practical issues (such as the cost of repurposing a specialized dental school building). Also included in the argument was the impact the closure would have on the community. The College provided $1.25 million worth of dental care and 37,000 patient visits through its low-cost and indigent dental clinic. It had also become the main source of treatment for medically compromised patients, particularly those with AIDS. The governor "quietly dropped his plan to close the

school" (Curtis, 2011, p. 109). Many observers credited the majority party Democrats for saving the College because they valued the "low-cost dental care [provided] to the community" and "may have enjoyed thwarting the plans of a Republican governor" (Curtis, 2011, p. 109). As a result of the school's vulnerability related to state funding, in 1988 Dean Russell Stratton helped create the J. Dean Robertson Society, an alumni and fundraising association, to help diversify the school's funding base. Over the years, non-state funding has become vital to the institution. In 2013, Delta Dental of Oklahoma Foundation made the single largest gift in the history of the OU College of Dentistry, donating $3.2 million to the OUCOD Legacy Project for extensive refurbishment of the aging facilities (Delta Dental of Oklahoma Foundation, n.d.-d.).

OUCOD Student Clinics are a crucial part of the oral health safety net. Student Clinics are located at the OU College of Dentistry building in Oklahoma City. At the *OUCOD Adult Clinic*, patients of all income levels receive low-cost comprehensive dental care while supporting the education of dental students. A wide range of quality dental care is delivered by dental students under faculty supervision, including crowns, bridges, root canals, and dentures (The University of Oklahoma College of Dentistry [OUCOD], n.d.-b). Rates are 30 to 70 percent lower than private practice fees (see the Fee Comparisons chart in Appendix D) and the clinic accepts Medicaid and private insurance. There are no income qualifications to receive treatment at the clinic, and charitable funds are available to help supplement the care of those unable to afford even the discounted rates. The *OUCOD Pediatric Clinic* provides care for children ages one through eleven at significant discounts. Medicaid and private insurance are accepted and there are no income qualifications (OUCOD, n.d.-b).

The OUCOD dental hygiene program offers the states only bachelor's degree in dental hygiene. In addition to the student care available at the OUCOD dental hygiene clinic in Oklahoma City, the program has satellite distance-learning locations at Tri County Technology Center (TCTC) in Bartlesville, Southern Oklahoma Technology Center (SOTC) in Ardmore, and Western Technology Center (WTC) in Weatherford (The University of Oklahoma College of Dentistry, n.d.-a.). The satellite clinics offer services at exceptionally low fees. For example, adult cleanings are available for $18.00 and $15.00 at TCTC and WTC, respectively (Tri County Technology Center, n.d.; Western Technology Center, n.d.), compared to $50.00 at a low-cost clinic and $76.00 at a private practice. Scaling and root planing costs $15.00 per quadrant at Southern Oklahoma Technology Center (n.d.), compared to $50.00 at a low-cost clinic and $220.00 at a private practice. Rose State College, located in Midwest City, and Tulsa Community College, offer an Associate in Applied Science degree in dental hygiene and also provide deeply discounted preventive treatment to the general public (Delta Dental of Oklahoma Foundation, 2018a).

Free Clinics and Programs

The importance and value of the charity-based components of the oral health safety net cannot be overstated and the altruism of the individuals who comprise each component should be recognized and appreciated. Volunteer dental professionals significantly expand the reach of charitable programs by donating their services (Dolgrin, 2013). However, free clinics and programs are completely dependent upon donors and volunteers and, as such, are inherently unsustainable. Free dental clinics are volunteer provider-driven, meaning the availability, specialty, and preferences of the

volunteer providers determine when and which patients are served (Mouradian, 2006). Also, efforts to "do good" by providing free care can result in unintended consequences, such as reinforcing misperceptions of the affordability of dental care, increasing demand for free services, and decreasing patients' sense of dignity and personal efficacy (Dolgin, 2013). Even so, benevolent dentistry is a vital part of the oral health safety net today. Free dental care components can be classified by mode: mobile/portable clinics, fixed (brick and mortar) free clinics, non-clinical facilitation programs, and dental practices.

Mobile/Portable Dental Clinics

The origin of mobile and portable dentistry dates to 1914 when the first dental hygienists were trained by Dr. Albert Fones to deliver preventive care to children in schools (Langelier, Baker, & Continelli, 2016). Over the past century, the use of mobile and portable dentistry has diversified and expanded to meet the needs of various underserved populations, including low-income adults and the elderly (Langelier et al, 2016).

The term *dental operatory* refers to the space and equipment required for a dentist or dental auxiliary to provide services to an individual patient, which may be in a permanent structure, like a dental office, or in a temporary setting utilizing portable equipment. Required equipment includes a reclining patient chair, provider stool, dental unit (which provides water, air, and suction), and a light source (which may be a small light attached to the provider's safety glasses or a standing lamp). Other necessary items, such as radiology (x-ray) equipment, sterilization equipment, and generators, may be shared among two or more operatories. The term *mobile* dental clinic or unit

generally refers to a self-contained dental facility custom-built on a recreational vehicle (RV) chassis or a commercial duty coach. A mobile dental unit includes everything required for providing services, including built-in dental operatories, radiology (x-ray) and sterilization equipment, generators, supplies, restrooms, heat and air conditioning, plumbing, and water supply. Units can operate independently but may utilize power and water hookups when available. An RV-style unit contains two to four dental operatories; a commercial coach may contain eight or more operatories (see Figures H1 and H2 in Appendix H for images).

The term *portable* dental clinic generally refers to a temporary clinic comprised of portable operatories, which includes a patient chair, provider stool, dental unit, generator, and lighting. These components have durable transport cases, sometimes with wheels, and can generally be carried by one person. Portable clinics range from a single dental operatory that can be transported in an automobile to 100-operatory dental clinics that are transported by semi-trucks (see Figure H3 in Appendix H for image). Oklahoma Mission of Mercy and Remote Area Medical Oklahoma are two large-scale, volunteer-driven portable dental clinic events held annually.

Mission of Mercy events are conducted across the United States. The events are organized and operated by state dental associations with the assistance of the America's Dentists Care Foundation (ADCF). Headquartered in Wichita, Kansas, ADCF is a nonprofit charitable organization founded in 2008 to provide portable dental equipment needed to host free dental clinic events. The equipment necessary to conduct a 100-operatory free clinic fills one tractor trailer. ADCF has two 100-operatory trailers and one 45-operatory trailer. To cover the costs of purchasing, maintaining, and delivering

the equipment, ADCF charges $45,000 for use of the 100-unit clinic, in addition to accepting cash and in-kind donations. ADCF also provides pre-event guidance, a project manual, and personnel on-site to handle any equipment issues. ADCF provides equipment for about 24 clinics annually (America's Dentists Care Foundation, n.d.).

The Oklahoma Mission of Mercy is a two-day free dental clinic event held the first weekend of each February in various cities. The event is produced annually by the Oklahoma Dental Association, which organizes and operates the event and recruits the hundreds of volunteer dental professionals required; the Delta Dental of Oklahoma Foundation, which provides $100,000 of the $150,000 event budget; and the Oklahoma Dental Foundation, which acts as fiscal sponsor and raises funds for the balance of the budget. (Delta Dental of Oklahoma Foundation, n.d.-c.). An OkMOM clinic is set up by volunteers on Thursday. The clinic doors open at 5:00 AM on Friday and Saturday and an average of 1,600 patients are treated on a first-come, first-served basis. Comprehensive dentistry is offered, including cleanings, extractions, fillings, a limited number of anterior (front teeth) root canals and crowns, and a limited number of dental "flippers" (temporary partial dentures). The clinic does not provide braces, dentures, root canals on back teeth, or extraction of impacted wisdom teeth (Delta Dental of Oklahoma Foundation, n.d.-c.).

OkMOM events attract hundreds of patients, many of whom wait in line for 12 to 48 hours before the event. All patients receive dental directories and exit counseling in an effort to connect them to local clinics for ongoing dental care. Since the first event in 2010, nine OkMOM clinics have been held in seven cities. The event is rotated to various cities to spread the availability of dental treatment across the state. Two events

have been held in each of the state's major metropolitan areas, Oklahoma City and Tulsa. Other events were held in rural cities, including McAlester, Lawton, Enid, Woodward, and Durant. Donated dental treatment valued at $11,230,166 was delivered to 14,454 patients at these events (Oklahoma Mission of Mercy, n.d.). See Table 2 for details.

Table 2. Oklahoma Mission of Mercy Statistics

Year #	Year	City	Number of patients	Value of services	Avg. value per patient	Number of volunteers
1	2010	Tulsa	1,805	$ 859,463	$ 476	1,674
2	2011	Oklahoma City	2,201	1,091,781	496	1,400
3	2012	McAlester	1,733	1,097,691	633	1,702
4	2013	Lawton	1,786	1,107,138	619	1,809
5	2014	Enid	1,465	1,344,540	918	1,717
6	2015	Tulsa	1,609	1,525,657	948	1,827
7	2016	Oklahoma City	1,576	1,716,688	1,089	1,927
8	2017	Woodward	1,322	1,306,907	989	1,462
9	2018	Durant	957	1,180,301	1,233	1,398
		TOTAL	**14,454**	**$ 11,230,166**	**--**	**--**
		AVERAGE	*1,606*	*$1,247,796*	*$ 778*	*1,657*

Note. Adapted from "Past OkMOMs," by Oklahoma Mission of Mercy (n.d.).

Remote Area Medical Volunteer Corps (RAM) is a nonprofit organization that conducts portable clinics providing medical and vision care in addition to dental care. Founded in 1985 by British expatriate Stan Brock, RAM is headquartered in Rockford, Tennessee. Originally established to conduct medical missions to remote, foreign locations, ninety percent of their events are now held in the U.S. (Raskins, 2015).

In contrast to the relationship between the America's Dentist Cares Foundation and the state dental associations that organize Mission of Mercy events, RAM partners with what they refer to as local Community Host Groups (CHGs) and provides turnkey clinic events. The portable dental equipment, provided at no charge to the CHG, is accompanied by a team of RAM staff members and core volunteers who manage the clinic. The CHG is responsible for recruiting local volunteers, local venue planning, and

promotion (Remote Area Medical, n.d.). Since 2016, the Rural Health Network of Oklahoma has acted as the Community Host Group for RAM Oklahoma, hosting RAM expeditions in the rural communities of Durant and Idabel. The size of a RAM expedition is dependent on the number of volunteer dental professionals. In Oklahoma, the RAM event utilizes between 30 and 40 dental operatories.

School-based sealant programs (SBSP), utilizing portable dental equipment to provide treatment on-site at low-income schools, are an effective way to provide dental sealants to at-risk children in a timely manner (see Figure H4 in Appendix H for image). Dental sealants are thin plastic coatings applied to the chewing surfaces of molars (back teeth), where about 90 percent of tooth decay occurs (Centers for Disease Control, 2016a). Dental professionals apply sealants by painting the sealant liquid onto the surface and into the pits and grooves of the tooth and then shining a curing light onto the tooth for about twenty seconds to solidify the sealant. By sealing out food particles and bacteria, sealants reduce the chance of molar caries by 80 percent during the first two years after application and 50 percent for up to four more years (CDC, 2016a). For best results, sealants must be placed as soon as possible after the eruption of the first molars (approximately age six or grade two) and the second molars (approximately age 11 or grade six). Even though sealants are proven to be effective, they are considerably underused. Forty-eight percent of higher-income children receive sealants and only 39 percent of low-income children receive sealants (CDC, 2016a, p. 3). The reasons for this difference are outlined in the children's dental disparities section chapter four.

Oklahoma does not have a statewide school-based sealant program, but the Delta Dental of Oklahoma Foundation launched a regional pilot program in 2015 with

the intention of developing a model SBSP that can be replicated throughout the state (Delta Dental of Oklahoma Foundation, n.d.-e.). The program is offered free of charge to elementary schools with 60 percent or greater participation in the Federal Free and Reduced Meal program, indicating a significant concentration of low-income households. Registered dental hygienists, with working orders from the program's Authorizing Dentist, provide sealants and fluoride varnish treatments for all second and sixth grade children who return a consent and health history form signed by a parent or legal guardian. Hygienists also provide oral health instruction and conduct dental assessments. An assessment and treatment report, which indicates any possible follow-up dental care that may be necessary, is sent home to parents/guardians, along with a list of nearby dental offices. Parents/guardians are instructed to seek follow-up dental care from a dentist and to establish a dental home for their children. The program serves an average of 800 students at 28 schools annually (Delta Dental of Oklahoma Foundation, n.d.-e.).

In 2006, the Oklahoma Dental Foundation (ODF) established the ODF Mobile Dental Care Program. In 2013, the ODF partnered with its major funder, the Delta Dental of Oklahoma Foundation, and renamed the program MobileSmiles Oklahoma. The program utilizes two RV-style mobile dental units to deliver treatment across the state. Services offered include preventive care (cleanings, sealants, fluoride), fillings, and extractions. Individual patients cannot schedule appointments with the program and treatment is not conducted in a "first-come, first-served" manner. Instead, the program partners with a local *site partner*, usually a nonprofit organization or agency, that is responsible for local coordination of patients (MobileSmiles Oklahoma, n.d.-a.).

On average, the program serves 182 patients and delivers $434,266 worth of dental care annually (MobileSmiles Oklahoma, n.d.-b.). Table 3 lists the program's service statistics for the past five years. While the program utilizes volunteer dentists to expand its reach, most of the treatment is performed by program staff and OU College of Dentistry externs (MobileSmiles Oklahoma, n.d.-c.).

Table 3. MobileSmiles Oklahoma Statistics - Past 5 years

Year	Treatment Days	Patients Served	Value of Services
2017	196	2,114	$537,607
2016	216	2,412	$631,866
2015	173	2,033	$417,554
2014	171	1,843	$311,552
2013	155	1,499	$272,752
Total	**911**	**9,901**	**$2,171,331**
Average	*182*	*1,980*	*$434,266*

Note. Adapted from "Program data," by MobileSmiles Oklahoma (n.d.-b.).

Free Dental Clinics (Fixed Clinics)

Since the 1960s, free clinics have existed to care for underserved, uninsured, working poor, homeless, migrant workers, and other vulnerable populations not being served by the health care system due to a variety of barriers to care. Free clinics provide one or more health care services, such as medical, dental, pharmacy, vision, or behavioral/mental health. While some are all-volunteer, many employ at least some health care staff in addition to relying on volunteer health care providers. To qualify as a free clinic, the organization must have its own 501(c)(3) tax-exempt status or operate as a component or program of a 501(c)(3) organization, cannot receive HRSA 330 funds, and is not a Federally Qualified Health Center or Rural Health Center. A free clinic may charge a nominal fee as long as it provides essential services to patients regardless of their ability to pay (National Association of Free and Charitable Clinics,

n.d.). Free dental clinics that are not mobile or portable are referred to as *fixed* or *brick and mortar*. These clinics are operated by faith-based or community nonprofit organizations, and range widely, from a single operatory installed in a church basement to a custom-built clinic with multiple operatories. It costs approximately $600,000 in start-up costs to establish a new dental clinic, including construction and equipment (Doherty, 2018). However, many organizations are without that level of funding, so they remodel a currently owned building and/or accept dental equipment donated by private practice dentists who are upgrading.

A clinic's hours of operation depend on its budget (to pay dental provider labor costs) and/or the volume of volunteer dental professionals. Clinic hours range from one half-day per month to 40 hours per week. The range of treatment offered is dependent upon the clinic's equipment and tools and the types of dentists or specialists available to the clinic. Table 4 lists free dental clinics in Oklahoma and their attributes. The "hours" column refers to the average number of clinic days the clinic operates. (A clinic day ranges from four to eight hours.) "By appointment" indicates the clinic is open intermittently, when a volunteer dentist is available.

Table 4. Free Dental Clinics in Oklahoma

Clinic	City	Hours	Services
Calvary Baptist Church Clinic	Lawton	1 day/wk.	X
Christian Medical Clinic of Grand Lake	Grove	1 day/mo.	R X
Crossings Community Clinic	Oklahoma City	5 days/wk.	C R X
Good Shepherd Clinic of OKC	Oklahoma City	5 days/wk.	C R X P
Green Country Free Dental Clinic	Bartlesville	3 days/wk.	C R X
Hope Dental Clinic	Elk City	by appt.	R X
King's Klinic	Oklahoma City	1 day/mo.	X
Ministries of Jesus Clinic	Edmond	2-3 days/wk.	C X R
Morton Mid-town Homeless Clinic	Tulsa	5 days/wk.	X R

Mother Teresa of Dental Care Center	Tulsa	5 days/wk.	C R X P
Open Wide Dental Clinic	Oklahoma City	1 day/mo.	C R X

Note. Regarding services column: C = cleanings; R = basic restorative (fillings); X = simple extractions; P = prosthetics (dentures, partials); E = endodontics (root canals, crowns). Adapted from "Resource for Dental Care: A Guide to Free and Low-Cost Care," by Delta Dental of Oklahoma Foundation, 2018a, pp. 1-11.

Facilitation Programs (Non-Clinical)

Facilitation programs are administrative programs (as opposed to clinics) that coordinate dental treatment provided free of charge to qualifying patients. Facilitation programs can be divided into two groups: *donated dental services programs*, in which volunteer dentists provide the care at no charge, and *facilitation components* of larger programs, in which dental services are paid for by the program.

Facilitation programs that coordinate donated dental services have four main tasks. First, they recruit and maintain a large roster of private practice dentists who have agreed to treat patients free of charge in their own dental offices. The dentists choose how many program patients they want to serve (e.g., one per month, quarter, or year). Second, the program receives and processes applications from prospective patients. Third, the program matches patients with volunteer dentists and helps to ensure the patient keeps the appointments. (Usually, more than one dental visit is necessary to complete the patient's treatment). Fourth, the program raises funds in order to cover the cost of dental labs, which are required for crowns and dentures. Because donated dental services programs provide comprehensive dental care, including crowns and dentures, they require proof of income and eligibility and have waiting lists, sometimes years long. The two donated dental services programs in Oklahoma are Dentists for the

Disabled and Elderly in Need of Treatment (D-DENT) and Eastern Oklahoma Donated Dental Services (EODDS).

Established in 1986, D-DENT provides services for individuals with developmental disabilities, veterans, and elderly persons who are low-income and uninsured. Located in Oklahoma City, D-DENT's service area is statewide, except for eastern Oklahoma. D-DENT receives funding from foundations, United Way, Oklahoma City-County Health Department, and private donors (Dentists for the Disabled and Elderly in Need of Treatment, n.d.). EODDS was founded in 2003 and serves residents who live in the 918 and 539 area code regions in eastern Oklahoma. Applicants must be low-income and either over 65 years of age or a Social Security Administration recipient (Social Security, Social Security Disability, Supplemental Security Income). EODDS also accepts formal referrals from their partnering agencies, including programs for veterans, homeless individuals, women in recovery, and others. EODDS is funded by foundations, Tulsa United Way, and private donors (Eastern Oklahoma Donated Dental Services, n.d.).

Another type of facilitation takes the form of a facilitation component of a 501(c)(3) nonprofit program that provides wraparound services for at-risk or recovering individuals. Facilitation components do not rely on volunteer dental professionals because the program pays for the treatment (at a discounted rate). However, the programs are dependent on grants and private donations, and, therefore, lack independent sustainability. City Rescue Mission, Homeless Alliance, and Remerge are examples of this type of program.

City Rescue Mission is a private, faith-based nonprofit organization located in downtown Oklahoma City that provides services for homeless and near-homeless individuals. Each year, the 640-bed shelter serves nearly 5,000 single men, single women, and women with children. More than just a shelter, City Rescue Mission offers a variety of programs designed to help clients find and overcome the root of the problems that led to their homelessness. Each client is aided by a Case Manager who helps him or her navigate the programs and social services. Programs include short-term emergency shelter, special physical and mental needs services, a school program that helps clients finish their GED or get additional training, and a work program that helps clients find living-wage employment. Because addiction is the root cause of instability and homelessness for most clients, the mission offers a holistic recovery program as well (City Rescue Mission, n.d.). Once a client completes initial steps of the recovery program, he or she is eligible to receive restorative dental care, including cleanings, fillings, extractions, and/or dentures or partials. The program receives foundation grants to cover the cost of the dental treatment, which is provided at a low-cost safety net clinic (Delta Dental of Oklahoma Foundation [DDOKF], 2017).

The Homeless Alliance, located in downtown Oklahoma City, operates several housing programs for families with children, veterans, and chronically homeless individuals. It also owns and operates the Westtown Homeless Resource Campus which includes a day shelter and several resources and agencies on-site to help connect homeless individuals to the services they need (Homeless Alliance, n.d.). Homeless Alliance's dental component provides emergency dental care for clients and is funded by foundation grants (DDOKF, 2017).

Remerge is a prison diversion program for pregnant women and women with minor children who face non-violent charges in Oklahoma County. All participants have a substance use disorder, mental disorder, or both and most have a background of trauma, generational poverty, lack of education, unemployment, and/or unmet health care needs. Remerge provides its clients with comprehensive support and treatment based on the individual needs of each in an effort to improve their chances of long-term recovery and retention or reunification with their children. Successful completion of the 18- to 24-month program results in pending legal charges being dismissed. Many clients have teeth that have been damaged by domestic abuse, prior drug use, or lack of access to care; grant funds are used to cover the cost of dental care (DDOKF, 2017), which improves the clients' health and chances for employment.

Dental Professionals

Indisputably, dental professionals are the keystone of the oral health safety net. Most charitable clinics and care facilitation programs are dependent on volunteer dental professionals. Dentists who work for nonprofit clinics make less pay than they would in private practice. Also, dentist participation in the SoonerCare program is vital. Additionally, more than 10,000 dentists and 30,000 other dental team members participate annually in the American Dental Association's Give Kids a Smile program, which rallies dentists nationwide to provide pro bono services to underserved children (ADA, n.d.-c.). Furthermore, many dentists quietly donate dental care to patients in the privacy of their offices and others conduct an annual "free dentistry day" in which they open their dental office to the community (Free Dentistry Day, n.d.). However, while the dentistry profession holds itself to a high standard of community service, even if

dentists were to increase their pro bono work fivefold, it still would not be enough to bridge the access to care gap (Smith, 2006).

Health Departments

State health departments play vital roles in oral health safety nets, though the range of activities and services offered differs significantly between states (Institute of Medicine, 2011). The Oklahoma State Department of Health (OSDH) was established by state statute to serve as Oklahoma's public health authority by protecting and promoting health, preventing disease and injury, and "assuring conditions by which Oklahomans can be healthy" (Oklahoma State Department of Health [OSDH], n.d.-h., para. 1). It is governed by the Oklahoma State Board of Health, which is comprised of eight members who represent specific multi-county regions and one member-at-large (OSDH, n.d.-h.). In 2008, the State Legislature passed a resolution that required the Oklahoma State Board of Health to "prepare and return to the Legislature a health improvement plan for Oklahoma for the general improvement of the physical, social, and mental well-being of all people in Oklahoma through a high functioning public health system (OSDH, n.d.-g., para. 1). A team of 30 representatives from various agencies and organizations, none of which represented oral health, was created to develop and implement the plan (OSDH, n.d.-j.). The resulting Oklahoma Health Improvement Plan (OHIP), initially issued in 2010 and updated in 2015, has no mention of oral health or dental care[4] (OSDH, 2015).

This lack of emphasis on oral health is reflected in the state's funding of the OSDH Dental Health Service, which has decreased over recent years. The OSDH originally established a dental clinic program to provide free dental care to qualifying

underserved children and pregnant women at various county health department dental clinics throughout the state, but the only two dental clinics that remain active are in Cleveland County and the Rogers County (OSDH, n.d.-c.). The OSDH "Friends for Life" Dental Education Program, through which twelve dental health educators traveled throughout the state teaching school children about oral health, was eliminated in 2016 (OSDH, n.d.-d.) due to state budget cuts. However, the OSDH Dental Health Service division still provides valuable services to communities and the oral health safety net. The division administers the Oklahoma Dental Loan Repayment Program, which annually awards $25,000 each to participating new dentists who choose to serve in designated dental health professional shortage areas (see Appendix E for map) and agree that a minimum of 30% of their patient base will be Medicaid patients (OSDH, n.d.-f.). The division also manages the Oklahoma Community Water Fluoridation Plan and assists communities with water fluoridation (OSDH, n.d.-a.). Furthermore, the division publishes Oklahoma Oral Health Needs Assessment reports (OSDH, n.d.-e.) and operates the Dental Health Education and Fluoride Varnish Program, which trains registered nurses to apply fluoride varnish to children's teeth (OSDH, n.d.-i.). In addition to the 68 county health departments that receive oversight, direction, and state funding from the OSDH, there are two independent city-county health departments, Oklahoma City-County Health Department (OCCHD) and Tulsa Health Department (OSDH, n.d.-b.). The OCCHD does not provide dental education or services. The Tulsa Health Department operated a dental clinic for Medicaid patients at its Central Regional location for several years, but it was closed in June of 2018 (Tulsa Health Department, n.d.).

Chapter 4: Dental Disparities

Because the purpose of the oral health safety net is to mitigate the effects of dental disparities experienced by various disadvantaged populations, it is important to understand how social determinants of health impact barriers to dental care. Moreover, by engaging oral health inequity as a social justice issue, it may be possible to increase the public will necessary to make changes and improve the broken system.

The term, *health disparities*, refers to "differences in health outcomes and their determinants between segments of the population, as defined by social, demographic, environmental, and geographic attributes" (CDC, 2011, p. 3). The term, *health inequalities,* is synonymous with health disparities, but is used more often in academic and research literature. Health inequalities that are considered unjust and unfair because they are avoidable and are associated with social disadvantage are called health *inequities* (Braveman & Gruskin, 2003; CDC, 2011). In other words, health inequities are unfair health disparities. Some health disparities are not considered "unfair," such as young people being healthier than elderly people. Their health status is not equal, yet it is not health inequity (i.e., an unjust, unfair, and avoidable difference) (Bravemen & Gruskin, 2003, p. 255). However, when differences occur between groups of people because some have more advantages in life than others (e.g., income, education, environment), health inequity occurs (Bravemen & Gruskin, 2003; Patrick et al., 2006). For example, as a population, adults aged 35-44 years who did not complete high school have three times as much untreated tooth decay as those with at least some college education (Dye, Li, & Thornton-Evans, 2012). Their comparative status is both a health inequality and a health inequity.

According to Braveman and Gruskin (2003), "equity means social justice or fairness; it is an ethical concept, grounded in principals of distributive justice," and health equity can be "defined as the absence of socially unjust or unfair health disparities" (p. 254). It is important to distinguish between *equality* and *equity*. Equality is providing everyone the same thing, regardless of their current situation. Equity is providing each person with what they need to improve their situation. Determining equity involves comparing resources and social determinants of more and less advantaged groups of individuals, that is, populations (Braveman & Gruskin, 2003). Figure 1 illustrates this concept.

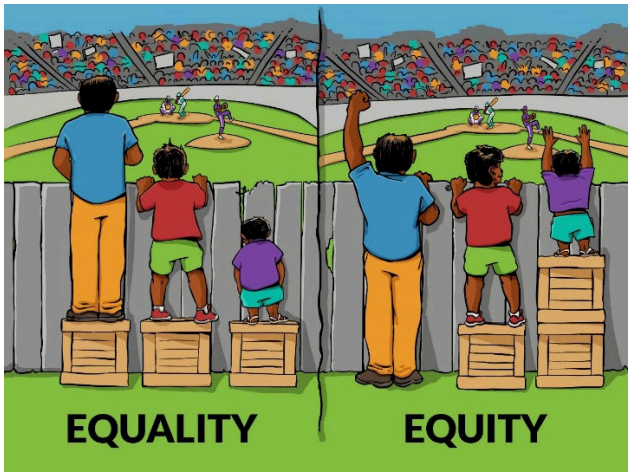


Figure 1. Equality vs. equity. From "Illustrating Equality vs. Equity," by artist Angus Maguire, Interaction Institute for Social Change, 2016. Reprinted with permission.

The tall person represents individuals with many advantages, such as high income, health insurance, employment, a college education, or being a member of the majority population. He does not need a box to stand on to see the ball game, yet, in an equal situation, he has one. The medium height person represents relatively less advantaged individuals. For example, he may be employed, but lives paycheck to paycheck and lacks health insurance. He may live in a geographically isolated area or

be a member of a disenfranchised racial or ethnic population. This person needs only one box to stand on to be able to see the ball game. The shortest person in the illustration represents individuals with a greater combination of underlying social disadvantages. In addition to being unemployed and uninsured, he may also be elderly, disabled, or a non-English speaker. This person needs two boxes to see over the fence. In the illustration, equity means each person has the number of boxes, and only the number of boxes, he needs to improve his situation to the desired outcome (i.e., the ability to view the ball game). Applying this principal to health equity means providing each individual with the number and type of resources he or she needs in order to achieve optimum health (Interaction Institute for Social Change, 2016).

Health inequities are mostly caused by the social determinants of health, which include the "conditions in which people are born, grow, live, work, and age" (World Health Organization [WHO], n.d.). In a broad sense, there are five major categories of social determinants: genes and biology, health behaviors, access to health care, social/societal characteristics, and the ecology of all living things (Tarlov, 1999). In Tarlov's (1999) illustration (figure 2), rough approximations of the relative proportional influence of each determinant are indicated by dashed lines and the "absence of a radial line separating total ecology from social/societal characteristics reflects the lack of quantitative knowledge" of those categories (p. 282-283).

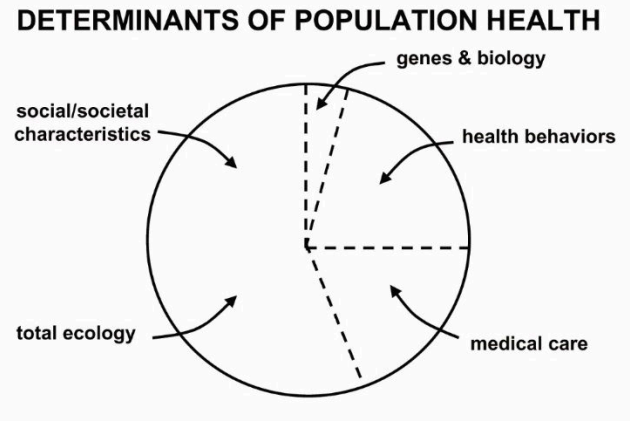


Figure 2. Relative influence of the five major health determinants. From "Public Policy Frameworks for Improving Population Health," by A. Tarlov, 1999, *Annals of the New York Academy of Sciences*, 896(1), p. 283. Copyright 2006 by John Wiley and Sons. Reprinted with permission.

In an oral health context, genes and biology include any genetic predisposition for dental disease and the presence of *mutans streptococci* bacteria in the mouth. Health behaviors include actions that negatively impact oral health (e.g., tobacco use, excessive intake of free sugars) as well as positive behaviors (e.g., effective oral hygiene habits, healthy diets). Medical care refers to access to and utilization of medical and dental health care, as well as community (artificial) water fluoridation. Social/societal characteristics are widely varied, including cultural, educational, socioeconomic, and social environment influences. The total ecology may include natural environmental aspects such as naturally occurring fluoride in water sources, geography, and climate.

Oral Health and Social Justice

There is no universal definition of *social justice*. In fact, the term has become increasingly politically charged[5], as expressed by Michael Novak, Catholic philosopher, journalist, and Ambassador to the United Nations Commission on Human Rights during the Reagan Administration, and his colleague, Paul Adams (2015), in their book, *Social*

Justice Isn't What You Think It Is. They assert that "social justice is a term that can be used as an all-purpose justification for any progressive-sounding government program or newly discovered or invented right" (p. 1) and that "the 'common good' is often yoked to 'social justice,' essentially to furnish an excuse for more government power, spending, and domination" (p. 32).

In contrast, Gostin and Powers (2006), who research public health law and ethics at Georgetown University, claim that a "commitment to social justice lies at the heart of public health" (p. 1060) and "stresses the fair disbursement of common advantages and the sharing of common burdens" (p. 1054). Social justice has also been defined as "the fair distribution of resources and responsibilities among members of a population, with a focus on the relative position of one social group in relationship to others…as well as the root causes of disparities and what can be done to eliminate them" (Canadian Nurses Association, 2010, p. 10).

Some experts consider oral health care to be a human right (Catalonotta, 2006; Smith, 2006) and that justice requires the fortunate in society to ensure some degree of access to the less fortunate (Rule & Welie, 2009; Smith, 2006). Dr. David H. Smith (2006), professor of ethics at DePauw University, claims that "justice requires no less" than for those in society who have power, and who cherish basic goods like health and education for themselves, to "recognize some level of obligation to make sure they are accessible to our fellow citizens" (p. 1171). But, Smith (2006) also acknowledges that for many "charity provision seems to us to be virtuous, whereas thinking of health care as a matter of right–of justice–seems troubling" (p. 1171).

Indeed, others balk at the notion of health care as a right, though they concede assisting the less fortunate is important to society. For example, libertarians believe that "what is merely unfortunate is not unfair" and that "society has no obligation of justice (as opposed to charity) to provide the poor with what they are missing" (Daniels, Kennedy, & Kawachi, 1999, p. 226). Even so, Daniels et al. (1999) contend that "social justice is good for our health" (p. 244). In other words, health inequities are minimized, and overall population health is improved, when a society adheres to principals of justice (Daniels et al., 1999, p. 244), and this is good for the individual and the whole. Likewise, while dental educator and ethicist David Chambers refers to the notion of health care being a right (i.e., being something owed to the individual) as a "bottomless opportunity to consume resources" (Chambers, 2011, p. 71), he asserts that health care should be subsidized for vulnerable and underserved populations, although the extent should be based on consideration of the social good, not a concept of personal rights (Chambers, 2011).

Social justice provides "a counterweight to the prevailing political view of health as primarily a private matter" and a "matter of personal responsibility" (Gostin & Powers, 2006, p. 1054). It is inherently unfair to expect disadvantaged individuals to make informed, healthy choices when their health care choices are eminently constrained, what Raskins (2015) refers to as the "tension between their responsibilization for their oral health and their restriction from achieving it" (p. 39). Smith (2006) acknowledges that "individuals do have responsibility for their own health, but the genetic and social lotteries distribute remarkably inequitably the power to do something about the hand of health cards we have been dealt" (p. 1172).

Furthermore, a social justice stance informs the social determinants of health and acknowledges the "multiple causal pathways to numerous dimensions of disadvantage" (Gostin & Powers, 2006, p. 1054) that destine individuals and families to cycles of poverty and poor health outcomes. As articulated by the World Health Organization's Commission on Social Determinants of Health (CSDH), "social justice is a matter of life and death. It affects the way people live, their consequent chance of illness, and their risk of premature death" (Commission on Social Determinants of Health, 2008, p.ii).

Barriers to Dental Care

Another way to analyze social determinants of health is to view the resulting barriers to dental care. Anything that hinders an individual from receiving adequate dental care services is a barrier to care. Various population groups experience differing numbers and combinations of barriers, including financial, lack of access to a dentist, lack of transportation, dependence on others, and psycho-social factors.

Financial barriers are caused by the inability to pay for services, which may be exacerbated by a lack of dental benefits. Moreover, a person's ability to afford dental treatment is subjective. Studies have shown that "irrespective of age, income level, and type of insurance, more people reported financial barriers to receiving dental care, compared to any other type of health care" (Vijicic, Buchmueller, & Klein, 2016, p. 2176). This perception of unaffordability may prevent insured and uninsured individuals alike from even seeking treatment. Lack of preventive care and delayed restorative treatment end up costing a patient much more in the long run. (See Appendix C for examples.) Opportunity costs also factor into a patient's ability to afford dental

care. Lost wages, bus fare, or childcare costs may make even free or low-cost treatment unaffordable for some patients (Guay, 2004). For nonelderly adults (ages 19-64), financial barriers are the leading cause for untreated dental need (Gupta, Vujicic, & Yarbrough, 2018; Vijicic et al., 2016). This correlates to the fact that most states offer very limited, if any, dental treatment for adults on Medicaid, as discussed in detail in the Medicare/Medicaid section of chapter three. It should be noted that individuals with dental insurance who are unable to afford the deductible or co-payment, even at a low-cost clinic or Federally Qualified Health Center, are not able to access the dental care they need, plus they are not eligible for most free dental care clinics or programs. Low-income older Americans (ages 65 and above) are particularly vulnerable to financial barriers to dental care. Retirees often find the benefits available through their previous employer are no longer an option after age 65 and many are surprised to find Medicare generally does not cover dental treatment. A survey by Oral Health America found that more than 50 percent of people over the age of 50 either did not know or believed that Medicare covers dental care (Oral Health America, 2016). Purchasing a Medicare Advantage Plan or private dental benefits or paying for treatment out-of-pocket is not possible for many on fixed incomes (Oral Health America, 2016).

Non-financial barriers to dental care access are more common in regard to children than are financial barriers, likely due to the fact that all states provide dental coverage for qualifying children through Medicaid (Gupta et al., 2018). Even so, some children do face financial barriers to care. For example, children without legal immigration status, children from households with income slightly higher than

Medicaid/CHIP eligibility, and low-income children with private dental benefits whose families are unable to afford the deductibles or co-payments (Gupta et al., 2018).

Access to a dentist depends on several factors, including the number and geographical distribution of dentists and the type of insurance accepted by the dentists. According to research from the American Dental Association (2018b), in 2017 there were 198,517 dentists in the U.S. (60.95 dentists per 100,000 population) and 1,964 dentists in Oklahoma (49.96 dentists per 100,000 population). The Oklahoma ratio is the lowest in ten years, which peaked in 2015 with 51.4 dentists per 100,000 population. As is common throughout the nation, dentists in Oklahoma are decidedly concentrated in the two major metropolitan areas (Oklahoma City and Tulsa), leaving many rural regions as *dental professional shortage areas,* that is, counties that meet federal criteria for shortages of dentists (Oklahoma State Department of Health, 2018). See Appendix E for a map of dental health professional shortage areas (HPSAs) in Oklahoma.

Finding a provider who accepts Medicaid patients can be difficult even in metropolitan areas where dental offices are concentrated. The number one reason cited by dentists for not accepting Medicaid is the low reimbursement rates paid by the state. (See Appendix D for a comparison of average private practice fees to Medicaid reimbursement rates.) According to the Health Policy Institute, the research affiliate of the American Dental Association, 87 percent of Medicaid insured children in Oklahoma live within fifteen minutes of a dentist who accepts Medicaid (ADA Health Policy, n.d.). However, analysts at the Pew Charitable Trust question the accuracy of the claim because the data used to produce this statistic were taken from the Insure Kids Now website, a national database which counts all dentists who are enrolled to accept

Medicaid, even if they are not serving a meaningful number of Medicaid patients or accepting new Medicaid patients. Because of this, some Medicaid experts adduce the Insure Kids Now data overestimate the availability of Medicaid dentists (Koppelman, 2017). In Oklahoma, there are 1,647 dentists (OHCA, 2017, p. 82) enrolled as SoonerCare providers but it is unknown how many patient slots are available to SoonerCare patients.

A lack of transportation contributes to the high no-show rate of low-income patients for dental appointments (Maxey, Norwood, & Liu, 2016). Even in metropolitan areas where the distance to dental providers is short, reliable transportation can be a barrier to obtaining services for under-resourced individuals. Compared to cities of similar sizes, Oklahoma's two metropolitan areas, Oklahoma City and Tulsa, are less funded and provide less frequent transit service (Oklahoma Health Equity Campaign, 2015).

Some individuals, such as those with disabilities, children, and older adults, must rely on others to take them to dental appointments. This can be a barrier to care when caregivers are unreliable, over-burdened, or uneducated about the importance of dental care. Addiction, mental illness, or the stressors of living in poverty may also hinder the ability of caregivers to fulfill their duties (Kelly, Binkley, Neace, & Gale, 2005). Reasons cited by low-income caregivers for not taking their children to the dentist include difficulty navigating or understanding the Medicaid system and how to locate a provider, negative impressions of Medicaid providers, dissatisfaction with previous dental care they or their children received, school attendance policies, high

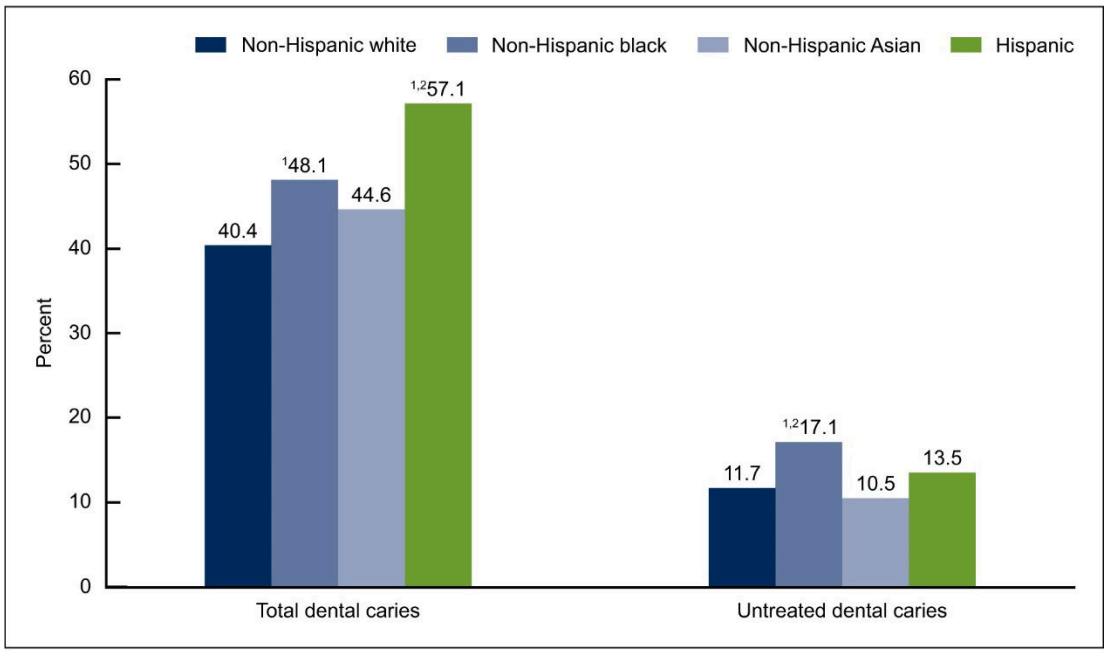
levels of personal dental fear, and the complexity of coordinating dental appointments, particularly for multiple children (Kelly et al., 2005).

Various psycho-social factors can also act as barriers to dental care. Dental anxiety or phobia can cause people to avoid dental treatment until the problem progresses to the point where the pain outweighs the fear. Some people have a lack of perception of need, particularly for preventive services and periodontal treatment. Kelly et al. (2005) found that non-utilization among low-income caregivers of children correlates with cultural and family norms that discount the importance of dental care or propagate a sense of fatalism, that is, the inevitability of tooth loss.

How Dental Disparities Impact Underserved Populations

Dental disease is “disproportionately distributed” (Institute of Medicine, 2011, p. 190), with more disease impacting disadvantaged and vulnerable populations. Furthermore, the dental disease exacerbates and reinforces the very detriments that cause it. Oral health disparity is one of the last tolerated forms of classism in the United States (Dolgin, 2013). According to Dolgin (2013), dental health is a "powerful sign of socioeconomic status at both ends of the nation's class hierarchy" (p. 1397). A single visibly missing tooth leads to an automatic assumption of low socioeconomic status just as straight, pearly whites imply wealth (Dolgin, 2013). At one end of the spectrum, those without the resources for the restoration of a decayed tooth must resort to extraction—sometimes by the patient's own hand out of sheer pain and desperation (Otto, 2017). At the other end, for those with financial resources and insurance "teeth have become consumer goods—more effective markers of class status, even, than clothing, jewelry, and hairstyle" (Dolgin, 2013, p. 1397).

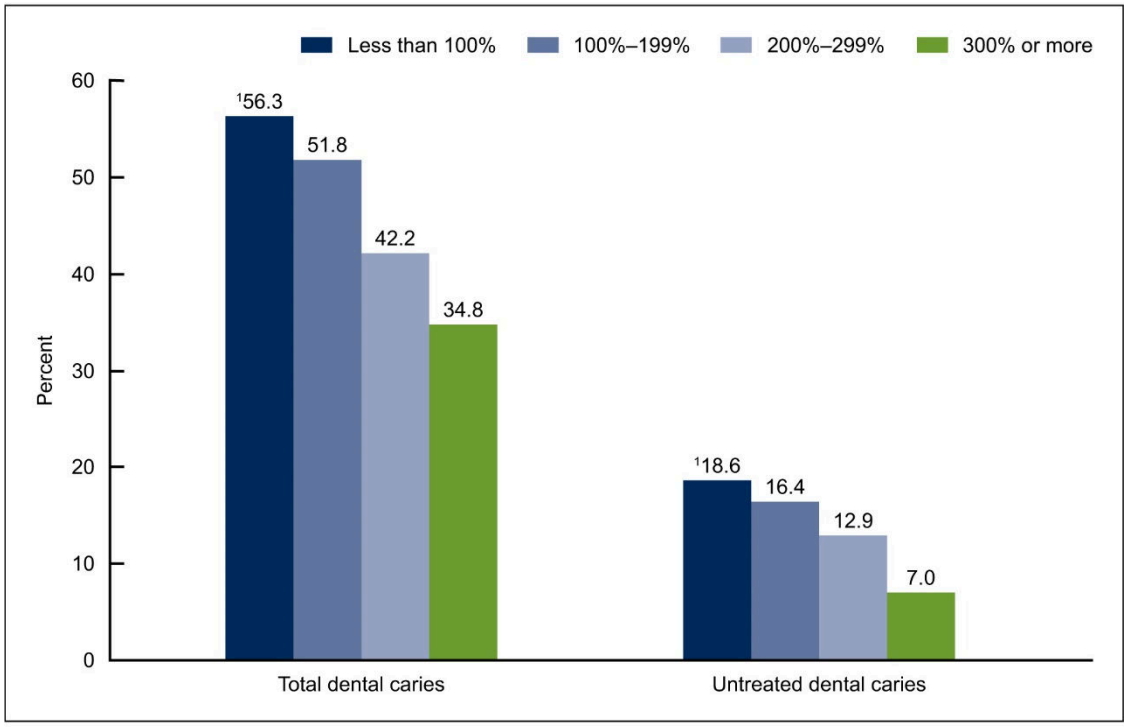
One way to measure dental disparities among children is to examine the prevalence of dental caries (i.e., treated and untreated cavities) in primary and permanent teeth. According to statistics from the National Center for Health, the prevalence of dental caries has decreased overall in recent years. In 2011-12, the prevalence of total dental caries among all children ages 2 to 19 was 50 percent and the prevalence of untreated dental caries was 16.1 percent. In 2015-16, the prevalence of total caries declined to 45.8 percent and untreated dental caries decreased to 13 percent (Fleming & Afful, 2018). However, significant oral health disparities are evident between children of different racial/ethnic backgrounds and income levels. The prevalence of dental caries was highest among Hispanic children (57.1 percent), compared to non-Hispanic white (40.4 percent), non-Hispanic black (48.1 percent), and non-Hispanic Asian (44.6 percent) children. However, non-Hispanic black children had a higher prevalence of *untreated* caries (17.1 percent) compared to non-Hispanic white (11.7 percent), non-Hispanic Asian (10.5 percent), and Hispanic (13.5 percent) children (Fleming & Afful, 2018). (See Figure 3.)



[1]Significantly different from non-Hispanic white youth.
[2]Significantly different from non-Hispanic Asian youth.
NOTES: Total dental caries included untreated and treated caries. Access data table for Figure 2 at: https://www.cdc.gov/nchs/data/databriefs/db307_table.pdf#2.
SOURCE: NCHS, National Health and Nutrition Examination Survey, 2015–2016.

Figure 3. Prevalence of total and untreated dental caries among children aged 2-19 years, by race and Hispanic origin: United States, 2015-16. From "Prevalence of total and untreated dental caries among youth: United States, 2015-16," by E. Fleming & J. Afful, 2018, NCHS Data Brief, no. 307. National Center for Health Statistics. In the public domain.

The prevalence of dental caries is inversely related to income level, that is, as household income level increases the prevalence of dental caries decreases. As shown in Figure 4, the prevalence of dental caries was 56.3 percent among children living in households with income levels below the federal poverty level and 51.8 percent among those in households with incomes up to 199 percent of the poverty level. This compares with a prevalence of 42.2 percent among children living at 200 to 299 percent of the poverty level and 34.8 percent among children in households with incomes exceeding 300 percent of the poverty level (Fleming & Afful, 2018).



[1]Significant decreasing linear trend.
NOTES: Total dental caries included untreated and treated caries. Access data table for Figure 3 at: https://www.cdc.gov/nchs/data/databriefs/db307_table.pdf#3.
SOURCE: NCHS, National Health and Nutrition Examination Survey, 2015–2016.

Figure 4. Prevalence of total and untreated dental caries among children aged 2-19 years, by federal poverty level: United States, 2015-16. From "Prevalence of total and untreated dental caries among youth: United States, 2015-16," by E. Fleming & J. Afful, 2018, NCHS Data Brief, no. 307. National Center for Health Statistics. In the public domain.

Regardless of income, dental disparities are strongly correlated to race and ethnicity among nonelderly adults (ages 19-64). In 2011-12 data, non-Hispanic black adults and Hispanic adults had higher rates of untreated dental decay (42 percent and 36 percent, respectively) than non-Hispanic white adults (22 percent) and non-Hispanic Asian adults (17 percent) (Dye, Thornton-Evans, Li, & Iafolla, 2015). Low-income nonelderly adults (regardless of race/ethnicity) have the highest rate of untreated dental decay of any age group (Vujicic et al., 2016). While the dental care utilization gap between low-income children and high-income children has exhibited a narrowing trend

over the past decade, the utilization gap between low-income and high-income nonelderly adults is widening (Vujicic et al, 2016, p. 2177).

The psychosocial and socioeconomic impact of poor oral health, particularly when it affects appearance, such as missing or decayed front teeth, has far reaching ramifications for low-income, working-age adults. A large body of research indicates that unattractive dental appearance can result in negative social judgments and discrimination (Al-Kharboush, Asimakopoulou, AlJabaa, & Newton, 2017; Ghada et al., 2017; Khalid, Abeer, Quinonez, & Carlos, 2015; Moeller, Singhal, Al-Dajani, Gomaa, & Quinonez, 2015), poor self-esteem (Bedos, Levine, & Brodeur, 2009), and even mental health issues, such as depression and anxiety (MacDougall, 2016). Bedos et al. (2009) found that low-income adults considered poor dental appearance to be more consequential than dental disease because it negatively impacted not only their self-esteem but also their employment prospects. According to the American Dental Association (n.d.-e.), 34 percent of low-income Oklahomans reported the appearance of their mouths and teeth affects their ability to interview for a job. Their employment concerns are not unfounded. Research indicates that visibly poor oral health may negatively affect employability (USDHHS, 2000; Rodd, Barker, Baker, Marshman, & Robinson, 2010) and is highly correlated with the perception of poor intellectual ability (Somani, Newton, Dunne, & Gilbert, 2010). Furthermore, according to Glied and Neidell (2010),

> the economic value of teeth in the labor market provides evidence of a largely overlooked benefit of oral health that can be used in assessing the cost-effectiveness of a wide range of dental interventions that may reduce disparities in dental health and thus improve the economic prospects of low-income individuals. (p. 470)

The improved employability of working-age adults makes an effective argument for states to invest in Medicaid adult dental benefits.

Barriers to dental care increase with age, even for higher income seniors, due to mobility issues. But lower income seniors, especially minorities, are impacted more. For example, 82 percent of seniors with incomes exceeding $45,000 had at least one dental visit in 2014, compared to just 35 percent of those at poverty level (Pew Charitable Trusts, 2016). Also, non-Hispanic black seniors were more than twice as likely to have untreated dental decay (41 percent) than non-Hispanic white seniors (16 percent) (Pew Charitable Trusts, 2016). A State of Decay, Vol. IV is a state-by-state analysis of six factors that impact the oral health of Americans aged 65 and above. Variables analyzed include severe tooth loss, adult Medicaid dental benefits, dental visits, community water fluoridation, state oral health plans, and state basic screening surveys. In the report released in 2018, Oklahoma ranks 47th, down from 42nd in the previous report released in 2016 (Oral Health America, 2016; Oral Health America, 2018).

Another vulnerable population being failed by Oklahoma is special needs patients. Special needs dentistry is the "branch of dentistry that provides oral care services for people with physical, medical, developmental, or cognitive conditions which limit their ability to receive routine care" (Special Care Dentistry Association, n.d.-a.). Special needs dentistry encompasses a broad range of disabilities, which extends beyond the intellectual and developmental disabilities to include debilitating or interfering levels of more common conditions, such as anxiety and asthma (University of Washington Dental Education in the Care of Persons with Disabilities Program,

2010). Children with special health needs are almost twice as likely to have unmet dental care needs than their peers, due to the unique challenges and barriers associated with special needs dentistry (Governor's Task Force on Children and Oral Health, 2009; Leroy & Declerck, 2013). Because many disabilities are life-long, these barriers continue to exist into adulthood. Though SoonerCare covers the cost of dental services for children with disabilities, there is a shortage of dentists with special needs dentistry skills and training (Governor's Task Force, 2009). Also, due to low reimbursement rates and a cumbersome and slow reimbursement process, many qualified dentists must limit the number of special needs patients they accept in order to offset their losses with better paying patients (Sanders et al., 2008).

Chapter 5: Conclusion

This study documented the past and present of the private practice system and oral health safety net in order to find a path forward. The study explored the complexity of dental disparities through a social justice lens to emphasize the importance of access to dental care for all Oklahomans. I found that workforce models used in other states to expand access to care are not embraced by organized dentistry in Oklahoma. I found that due to the failure of the public component of the oral health safety net, SoonerCare, to cover low-income adults, the burden of care for this population falls to charitable dentistry and that demand for free dental treatment far exceeds its supply and always will. Charitable endeavors are to be commended and valued, and there will always be a place for them in American society. However, the term *free dental care* is a misnomer, as there is no such thing as free dental care; the cost is simply shifted from the patient to the programs, providers, and donors who make the care possible. And, experts agree, charitable dentistry is no substitute for the systemic change required to improve the access to dental care problem (Mouradian, 2006; Smith, 2006).

Some proposed solutions which may be addressed in future research include the following:

- Increase SoonerCare funding to provide preventive and restorative dental treatment for adults (Gupta, Vujicic, Yarbrough, & Harrison, 2018). The additional spending could be partly offset by a decrease in unnecessary Emergency Department visits and uncompensated care (Edelstein, 2010; Surdu, Langelier, & Moore, 2016; Vujicic, Buchmueller, & Klein, 2016).

- Expand SoonerCare to provide medical and dental coverage to more low-income Oklahomans. Improving the health and employability of working-age adults could result in better employment and increased income tax revenue (Antonisse, Garfield, Rudowitz, & Artiga, 2018; Glied & Neidell, 2010).
- Increase reimbursement rates for SoonerCare providers in order to increase the number of dental visits available for underserved and vulnerable (Bailit & D'Adamo, 2012; Chalmers & Compton, 2017; Edelstein, 2010; Institute of Medicine, 2010).
- Follow the lead of other states and bolster the dental workforce by licensing midlevel providers and expanding the scope of practice for dental hygienists (Department of Health and Human Services Oral Health Coordinating Committee, 2016; Edelstein, 2010; Institute of Medicine, 2010; U.S.).
- Increase the use of patient navigators, such as Community Dental Health Coordinators, to teach patients how to find and afford the dental care they need (American Dental Association, n.d.-f; Reidy et al., 2015).

No one should have to spend the night in line to receive free dental care or, worse yet, do without the dental treatment they need. Policy makers, health care advocates, and stakeholders must work together to create a more effectual and equitable dental care delivery system that supports the oral health and dignity of all individuals. This paper may serve as a starting place for that work.

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APPENDIX A: Oral Health Defined

According to the American Dental Association (2014a), oral health is "a functional, structural, aesthetic, physiologic and psychosocial state of well-being and is essential to an individual's general health and quality of life."

The World Health Organization (2012) defines oral health with more specificity:

> Oral health is essential to general health and quality of life. It is a state of being free from mouth and facial pain, oral and throat cancer, oral infections and sores, periodontal (gum) disease, tooth decay, tooth loss, and other diseases and disorders that limit an individual's capacity in biting, chewing, smiling, speaking, and psychological wellbeing. (para. 1)

In September of 2016, the FDI World Dental Federation released a comprehensive definition of oral health and accompanying theoretical framework with the goal of establishing a universal definition for the dental profession as well as other stakeholders (Glick et al., 2016). It reads:

> Oral health is multifaceted and includes the ability to speak, smile, smell, taste, touch, chew, swallow, and convey a range of emotions through facial expressions with confidence and without pain, discomfort, and disease of the craniofacial complex. (Glick et al., 2016, p. 916)

The FDI's official definition continues to include the following attributes of oral health:

- It is a fundamental component of health and physical and mental well-being. It exists along a continuum influenced by the values and attitudes of people and communities.
- It reflects the physiological, social, and psychological attributes that are essential to the quality of life.
- It is influenced by the person's changing experiences, perceptions, expectations, and ability to adapt to circumstances. (Glick et at., 2016, p. 916)

The FDI definition has been adopted by the American Dental Association and 200 other dental associations worldwide. Because it mirrors the World Health

Organization's definition, it is said to be evolutionary as opposed to revolutionary (Glick et al., 2016).

APPENDIX B: Oral Health Conditions

According to the Centers of Disease Control and Prevention (2016c), the most common oral health related diseases are dental caries (also known as dental decay), periodontal disease (better known as gum disease), and oral cancer.

Dental Caries

Dental caries is a complex multi-faceted disease, with factors like bacteria and professional care playing as large a role as diet and personal hygiene habits (Otto, 2017). Dental decay is caused when acid breaks down the tooth's outer surface, or enamel. The acid is produced when bacteria, present in the plaque that accumulates on teeth, metabolizes "fermentable carbohydrates" (Wright et al., 2016, p. 673), also known as free sugars. Examples of free sugars include all types of sugars added to food and drinks by manufacturers, cooks, or consumers, as well as the natural sugars present in honey, syrups, and fruit juices (World Health Organization [WHO], 2017, p. 1). Because dental decay cannot happen in the absence of dietary sugar, higher intake of sugar is associated with higher rates of dental caries (WHO, 2017).

The decay process starts as non-cavitated lesions which are "characterized by a change in color, glossiness or surface structure" (Wright et al., 2016, p. 673). Left untreated and continually exposed to free sugars, the demineralization process will eventually breach the surface structure of the tooth, resulting in a hole, commonly referred to as a cavity (Wright et al., 2016). Dental decay is an infectious disease in that the strain of bacteria that causes decay, *mutans streptococci*, can be passed between people. Babies are born without the bacteria in their mouths, but it is often transmitted

to them by their mothers (U.S. Department of Health and Human Services [USDHHS], 2000). This illustrates why education is as important to oral health as dental treatment.

Periodontal Disease

Most people are aware that dental decay leads to the loss of teeth, but many do not realize that periodontal disease (better known as gum disease) is equally as dangerous to oral health. Gingivitis is a mild form of periodontal disease marked by red, swollen, and bleeding gums. Left untreated, gingivitis can advance to periodontitis, in which plaque spreads below the gum line and hardens (forming tartar). Toxins are created by bacteria in plaque and can cause a chronic inflammatory response that can lead to the destruction of gum tissue, causing teeth to loosen (American Academy of Periodontology, n.d.).

Oral Cancer

Oral cancer refers to cancers found in the mouth and the back of the throat. Oral cancers are largely preventable and account for about three percent of all cancer cases. While oral cancer rates have increased by 15 percent over the past four decades, the five-year survival rate has also increased, though early detection is crucial and significant disparities occur among certain population groups (National Institute of Dental and Craniofacial Research, 2018).

APPENDIX C: Dental Treatment and Costs

Preventive Care

Benjamin Franklin is credited with the enduring idiom, "an ounce of prevention is worth a pound of cure," and nowhere is the saying better applicable than in oral health. Dental decay is largely preventable with a combination of individual self-care and regular professional care (USDHHS, 2000). Basic preventive treatment includes cleanings (formally known as prophylaxis), dental sealants, and fluoride treatments. Advanced oral disease requiring intensive and expensive treatment can be averted by preventive care and early treatment of minor problems (Pourat, Choi, & Chen, 2018). Most dental insurance plans cover preventive care completely (with no out-of-pocket cost for the patient) because of the proven long-term cost savings (Walton, 2018).

Periodontal Disease Treatment

Daily brushing and flossing along with annual dental cleanings can prevent gum disease, but in many cases, patients served by the oral health safety net are unaware of the importance of preventive treatment or are unable to access it. Once a patient's condition has advanced beyond the point that a regular cleaning will suffice, the hygienist must perform scaling (to remove plaque and tartar below the gum line) and root planing (to smooth the tooth root to help gums reattach to the tooth). Scaling and root planing are more invasive than cleaning and may require local anesthetic and more than one visit (American Academy of Periodontology, n.d.). The cost of lack of prevention is high. Whereas the average fee for a cleaning in a private practice is about $89, the fee for scaling and root planing for a *single quadrant* of the mouth is $241. (Delta Dental of Oklahoma Foundation [DDOKF], 2018a).

Restorative Treatment

Fillings, root canals, and crowns are treatments used to restore the health of a tooth. Fillings, in which decay is drilled out and replaced with filling material, are an effective treatment for caries when decay is treated soon enough. The two most common types of filling materials are amalgam and composite. Amalgam fillings, made of a mixture of metals including mercury and silver, are most often used on posterior (back) teeth, and can last more than ten years (Colgate, n.d.). A tooth-colored resin composed of plastic and fine glass particles is used for composite fillings, which are more durable than amalgam fillings and cost about 25 percent more (Colgate, n.d.). The average private practice fees for two-surface amalgam and composite fillings are $176 and $225, respectively (DDOKF, 2018a).

When a tooth is too damaged by injury or decay to be repaired with a filling, a root canal (formally, *endodontic treatment*) is performed by a specialist known as an endodontist. A root canal involves removing inflamed or infected pulp, shaping the inside of the root canal, and sealing the tooth with a permanent crown (also known as a cap) (American Association of Endodontists, n.d.). The average private practice fee for a root canal is $1,026 and the fee for a crown is about $1,136 (DDOKF, 2018a), making this treatment cost prohibitive for many patients, who instead opt for extraction of the tooth. Because only three percent of all dentists are endodontists and root canals must be performed by an endodontist, root canals are not available at all safety net clinics.

Dentures

Full and partial dentures are removable replacements for missing teeth. Produced in dental laboratories by specially trained technicians, dentures are fitted by

dentists and often require multiple visits for adjustments. The average private practice fee for one denture plate (top or bottom) is about $1,293 (DDOKF, 2018a). Some components of the oral health safety net provide free and reduced-cost dentures for qualifying patients. While dental implants are a permanent alternative to dentures, at a cost of $3,000 to $4,000 for a single tooth implant (The Dental Implant Center, n.d.), they are cost prohibitive and are not available through the oral health safety net.

APPENDIX D: Fee Comparisons

Because the financial complexity of dental care is a dominant theme in this paper, a brief list of common dental treatments and fees is provided in Table D1. Column 1 represents private practice fees based on actual claims data analyzed by Delta Dental of Oklahoma (Delta Dental of Oklahoma Foundation, 2018a). Column 2 contains the reimbursement rates dentists receive from SoonerCare, Oklahoma's Medicaid program. It is clear why low reimbursement is a leading reason given by dentists who choose not to take Medicaid patients or who limit the number of Medicaid patients they serve (Otto, 2017, p. 120). Column 3 contains the fees charged by the Student Clinic at the University of Oklahoma College of Dentistry (OUCOD). Column 4 contains the fees charged by the NSO Dental Clinic, a nonprofit low-cost clinic located in Oklahoma City. Details about OUCOD and NSO are found in chapter three.

Table D1. Comparison of dental fees among private practice, Medicaid, and low-cost clinics

Service	1 Private Practice[a]	2 SoonerCare[b]	3 OUCOD[c]	4 NSO[d]
Comprehensive exam	$82.74	$28.20	$39.00	$35.00
Complete series x-ray	$156.42	$56.39	$53.00	$20.00
Prophylaxis (teeth cleaning), adult	$88.63	$42.29	$37.00	$50.00
Filling, amalgam, 2-surface, posterior	$176.29	$87.40	$74.00	$75.00
Filling, composite, 2-surface, posterior	$225.24	$87.40	$94.00	$90.00
Crown, porcelain/ ceramic	$1,136.00	$563.82	$473.00	$600.00
Root canal	$1,025.56	$394.68	$263.00	$500.00
Scaling, root planing, 4+ teeth, 1 quadrant	$241.07	$140.95	$70.00	$50.00
Complete denture - top only	$1,292.62	n/a	$400.00	$250.00
Simple extraction	$155.65	$62.02	$73.00	$60.00

Note. [a]Delta Dental of Oklahoma Foundation (2018a). [b]Oklahoma Health Care Authority (2018). [c]The University of Oklahoma College of Dentistry (n.d.-b.). [d]Neighborhood Services Organization (2016).

APPENDIX E: Dental Health Professional Shortage Areas

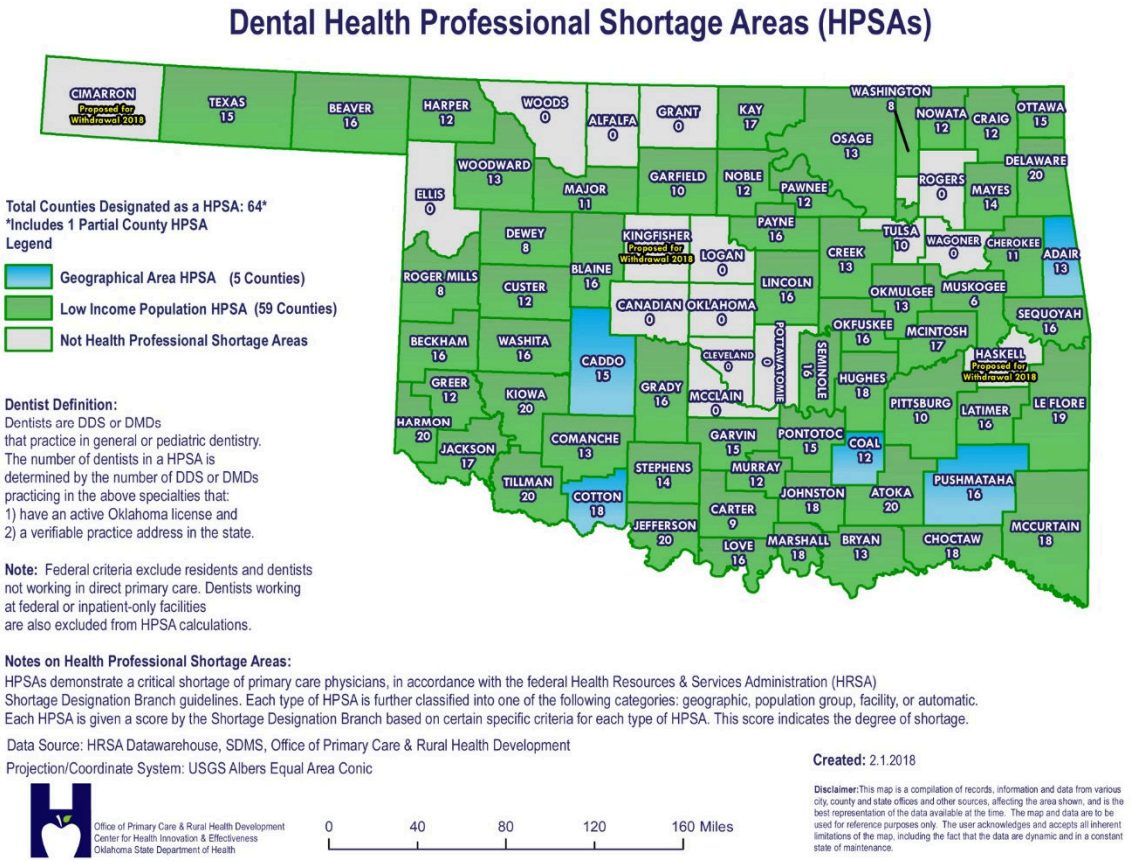

Figure E1. Dental health professional shortages areas in Oklahoma. Green indicates the number of SoonerCare dentists available in the county is not enough to meet the needs of the qualifying low-income population of the county. Blue indicates the ratio of dentists (both private and SoonerCare) to population is too low. Gray indicates the county is not a dental HPSA. The number that appears in each county is the score assigned by the Shortage Designation Branch based on specific criteria. From "Dental Health Professional Shortage Areas," by Oklahoma State Department of Health, 2018. Reprinted with permission.

APPENDIX F: Federally Qualified Health Centers and Satellite Sites

Table F1. List of Federally Qualified Health Centers (also known as Community Health Centers)

Federal Qualified Health Center	Main Clinic Location
Arkansas Verdigris Valley Health Centers, Inc.	Porter
Caring Hands Healthcare Centers, Inc.	McAlester
Central Oklahoma Family Medical Center, Inc.	Konawa
Community Health Centers of Oklahoma	Spencer
Community Health Center of Northeast Oklahoma, Inc.	Afton
Community Health Connection, Inc.	Tulsa
East Central Oklahoma Family Health Center, Inc.	Wetumka
Fairfax Medical Facilities, Inc.	Hominy
Family Health Center of Southern Oklahoma	Tishomingo
Great Salt Plains Health Center	Cherokee
Kiamichi Family Medical Center, Inc.	Battiest
Lawton Community Health Center	Lawton
Morton Comprehensive Health Services, Inc.	Tulsa
Northeastern Oklahoma Community Health Centers, Inc.	Hulbert
Panhandle Counseling & Health Center	Guymon
Pushmataha Family Medical Center, Inc.	Clayton
Shortgrass Community Health Center	Hollis
South Central Medical & Resource Center	Lindsay
The Health and Wellness Center, Inc.	Stigler
Variety Care	Oklahoma City

Note. Adapted from "Community Health Centers 2017 Fact Sheet," by Oklahoma Primary Care Association, 2017.

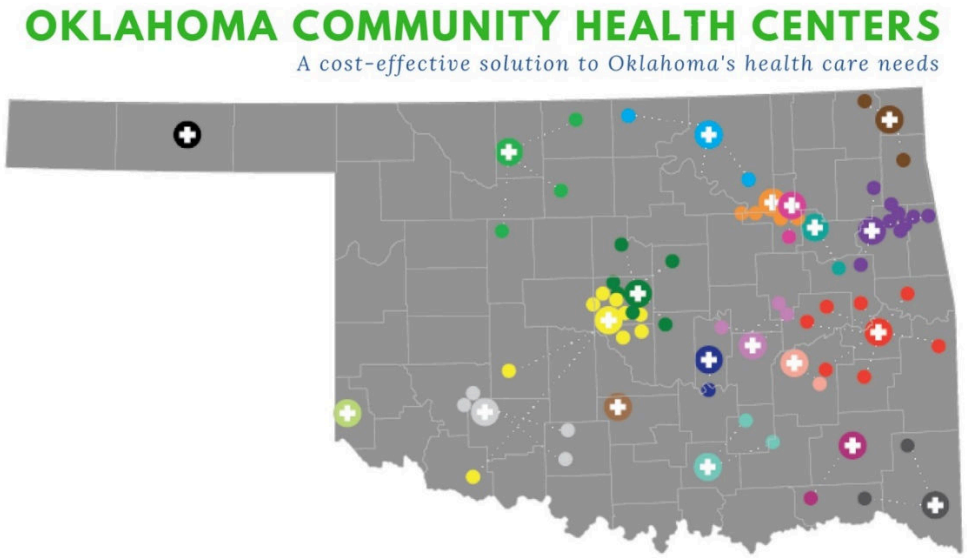

Figure F1. Map of Federally Qualified Health Centers and satellite sites in Oklahoma. Main FQHC clinics are indicated by large dots and their corresponding satellite clinics are indicated by smaller dots joined by dotted lines. From "Fast Facts Advocacy Document," by Oklahoma Primary Care Association, n.d. Reprinted with permission.

APPENDIX G: Areas within a 30-minute Drive Time of an FQHC

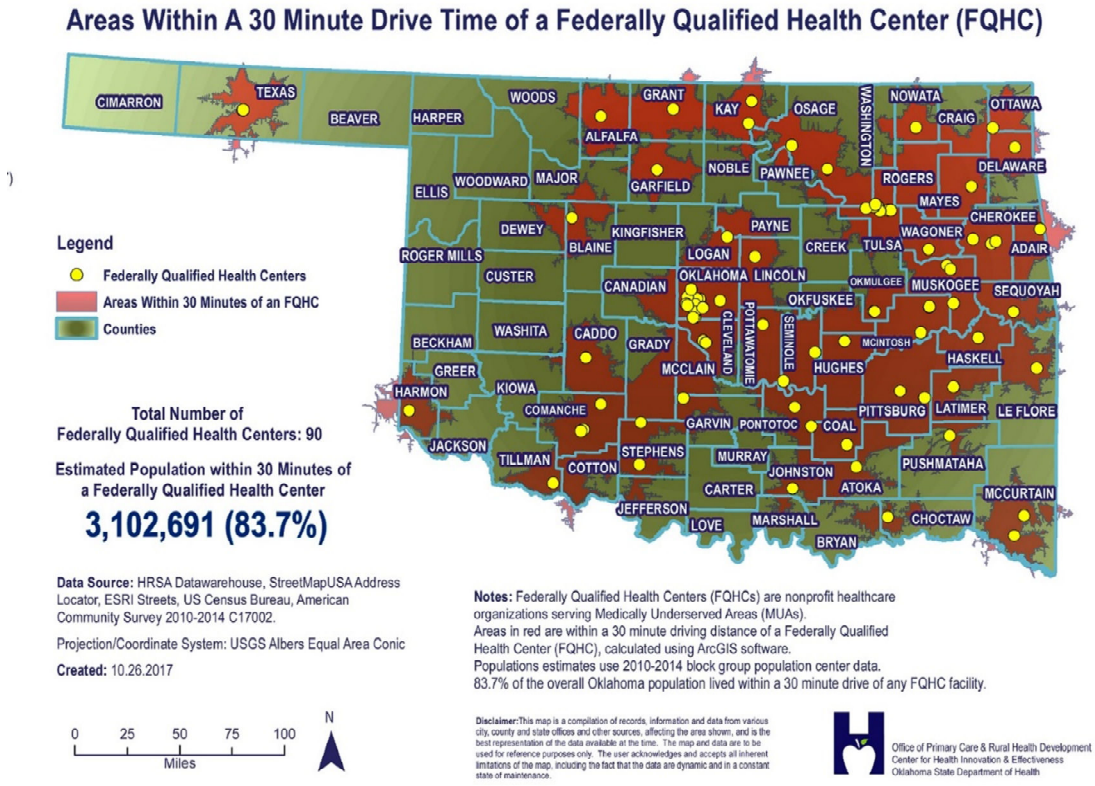

Figure G1. Map of Federally Qualified Health Center locations and drive times. From "Areas within a 30 Minute Drive of a Federally Qualified Health Center," by Oklahoma State Department of Health, 2017. Reprinted with permission.

APPENDIX H: Images of Mobile and Portable Clinics

Figure H1. Example of a mobile dental unit. Copyright 2014 by Oklahoma Dental Foundation. Reprinted with permission.

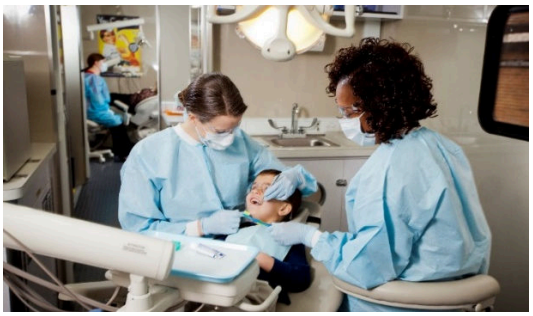

Figure H2. Example of a mobile dental unit operatory. Copyright 2013 by Delta Dental of Oklahoma Foundation. Reprinted with permission.

Figure H3. Oklahoma Mission of Mercy clinic in Tulsa. Copyright 2015 by Delta Dental of Oklahoma Foundation. Reprinted with permission.

Figure H4. Example of portable clinic used by school-based sealant program. Copyright 2017 by Delta Dental of Oklahoma Foundation. Reprinted with permission.

Endnotes

[1] For definitions of oral health, see Appendix A.

[2] I had the privilege of meeting the current U.S. Surgeon General, Vice Admiral Jerome Adams, at the Remote Area Medical (RAM) event held in Durant, Oklahoma, in June 2018, at which time he said he is planning to release a follow-up report to the 2000 Surgeon General's report on oral health during his tenure.

[3] According to the Institute of Medicine (2011), dentally *underserved populations* include individuals who are unable to access the dental care they need due to financial, geographical, or other barriers. *Vulnerable populations* are groups who are generally disadvantaged in some way or less capable of protecting their own interests. Children, pregnant women, individuals who are elderly, under-educated, members of a minority, or non-English speakers, as well as those with chronic illness or disability are considered vulnerable populations. An individual's status as underserved or vulnerable may be transient, such as unemployment or pregnancy, or permanent, such as race or disability.

[4] The Oklahoma Health Improvement Plan includes decreasing tobacco use. While this is tangential to oral health, it is not a substitute for the inclusion of oral health as a whole. In 2007, Governor Brad Henry created the Governor's Task Force on Children and Oral Health, which released a report in 2009. However, no such comprehensive report encompassing oral health for all ages exists.

[5] I became aware of the volatility of the term *social justice* the first time I attended a regional convening (in a southern state) at which access to dental care was presented as a social justice issue and an older, male dentist became so incensed by the

concept (or the way in which it was presented) that he stormed out. People from various generations, cultures, and geographic areas interpreted the concept differently.