

LEGISLATIVE BUDGET AND FINANCE COMMITTEE

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A Study Pursuant to House Resolution 68: Rural Dental Health

January 2023



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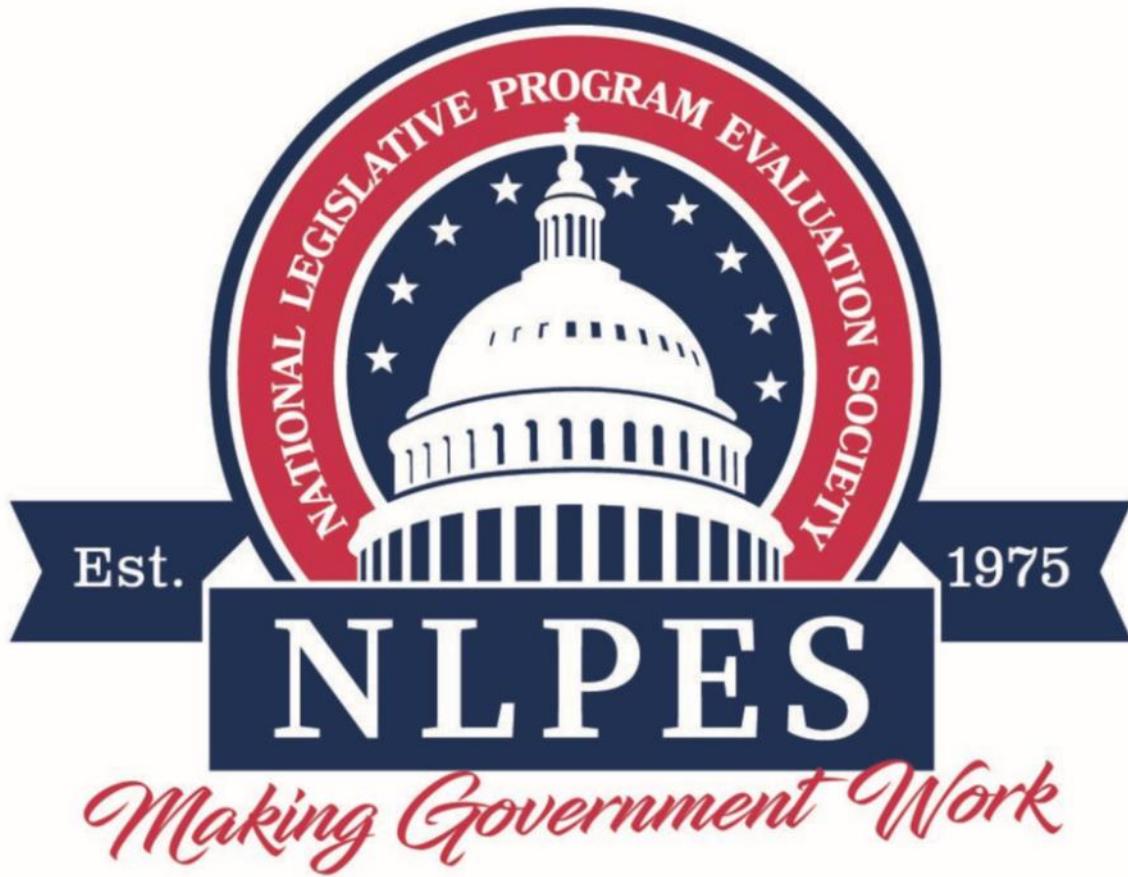
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REPORT SUMMARY



Objectives

Our objectives for this study were the following:

1. *Identify the availability of dental services in rural areas of Pennsylvania.*
2. *Examine the costs and barriers to oral health services for residents who live in rural areas of Pennsylvania.*
3. *Identify and discuss possible recommendations to expand oral health care services for rural Pennsylvanians.*

Report Overview

Dental care is important for all Pennsylvania residents, but for those living in rural areas access to dentists can be an issue. Consequently, on March 23, 2021, the Pennsylvania House of Representatives adopted House Resolution (HR) 68. This resolution pertains to the availability of dental health services in rural areas of Pennsylvania and further seeks recommendations to expand oral health care in those areas of the state. In response to HR 68, on April 7, 2021, the Officers of the Legislative Budget and Finance Committee (LBFC) adopted the resolution as a staff project (see left text box).

Key sections of our report include the following:

- **Section I – Objectives, Scope, and Methodology**
- **Section II – Background Information About Dental Health**
- **Section III – Dental Services in Pennsylvania**
- **Section IV – Costs and Barriers to Dental Care for Rural Community Populations**
- **Section V – Potential Strategies for Expanding Access to Dental Care**

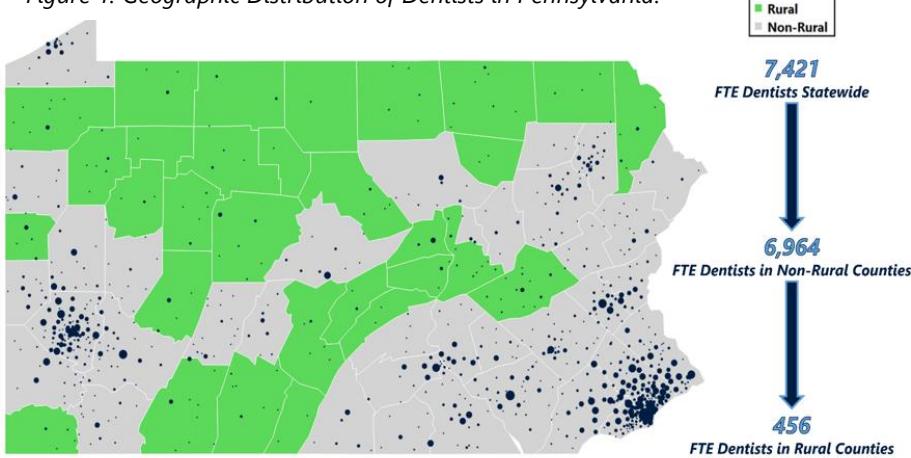
In the pages that follow (S-1 through S-6), we have summarized our results from Sections III, IV, and V. In addition, staff from the Pennsylvania Department of Health and the Pennsylvania Department of Human Services have reviewed a draft of our work.

Section III – Dental Services in Pennsylvania

Our analysis of ADA data found that there were over 7,000 licensed dentists actively operating across 6,800 practice locations in Pennsylvania in 2019.

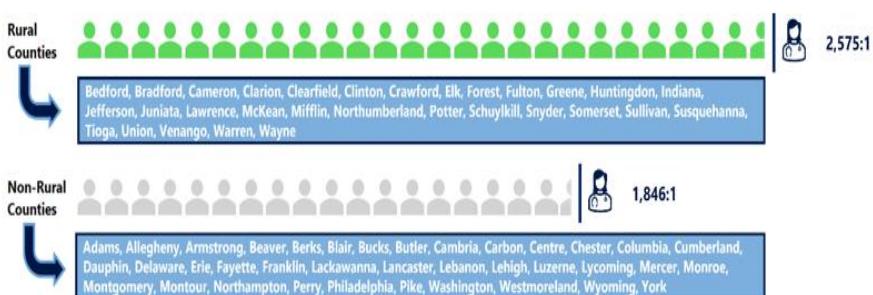
Understanding access to dental services in Pennsylvania, and more specifically rural areas of Pennsylvania, begins with identifying where dental providers are located. Because there is no single and complete data source for dental providers and their locations of operation, we used several sources to create a comprehensive analysis for the scope of this study. With the assistance from the American Dental Association (ADA), we determined that there were over 7,000 licensed dentists actively operating across 6,800 practice locations in Pennsylvania in 2019. In addition, we determined that the number of dentists per capita has decreased by 7 percent over the 20-year period between 2001 and 2021.

Figure 1: Geographic Distribution of Dentists in Pennsylvania.



When we compared the geographic distribution of dentists based on the number and location of dental offices,¹ we found that the number of providers in non-rural counties outpaced those in rural areas at a ratio of 15:1, and dentists in non-shortage areas outnumbered those in designated Dental Health Professional Shortage Areas (DHPSA) at a rate of 5:1.

Figure 2: Rural counties have more MA recipients per Medicaid dentist than non-rural areas.



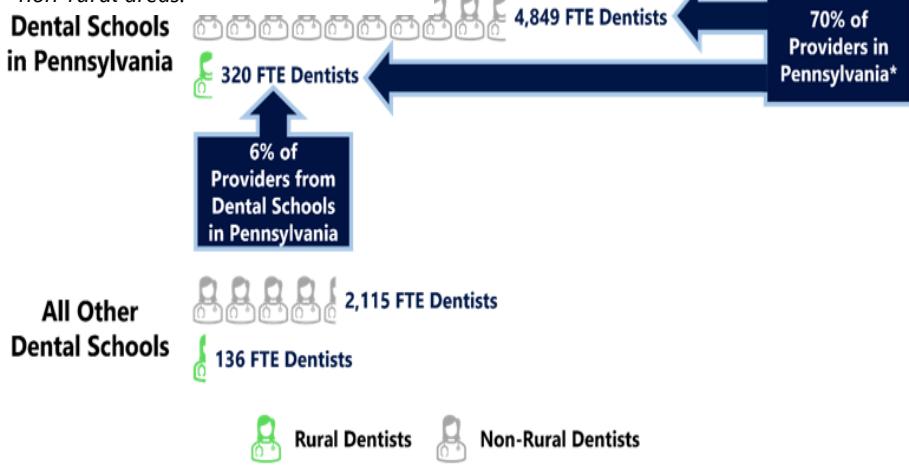
Section IV – Costs and Barriers to Dental Care for Rural Community Populations

For residents residing in rural communities, the primary obstacle to dental care is access to a dentist. In addition to using the data we collected on the number of dentists and their practice locations, we also used demographic detail to analyze expected employment trends. We looked at the "outflow" of dentists, which is influenced by dentists retiring or leaving the state – and the "inflow," which are new dentists entering the field,

¹ As will be discussed later in this section, we weighted each dentist listed in the records obtained from the ADA by the number of practice locations they maintained. This number was used when comparing the geographic distribution of dentists across Pennsylvania, thereby limiting the overcounting of providers.

primarily from Pennsylvania's dental schools. We found there is an imbalance as there are more dentists expected to retire or leave the field, than are currently entering the workforce through Pennsylvania-based dental schools.

Figure 3: Most dentists from dental schools in Pennsylvania practice in non-rural areas.



Most troubling with this imbalance is that rural communities are likely to be further underserved because new dentists are not locating to rural areas to begin their practice. Instead, dental graduates are preferring more readily available employment options in non-rural areas of the state. For example, we found that in 2019, only six percent of the graduates from Pennsylvania-based dental schools practiced in rural areas.

Anecdotally, experts informed us that the prevalence of Dental Service Organizations (DSOs), which own or contract with oral healthcare practices to manage the business and non-clinical operations, has changed the nature of dental work. DSOs offer many advantages to dentists in terms of compensation, quality of work life, and practice growth. Further, patients also benefit from DSOs and their ability to lower costs through economies of scale, which can lower out of pocket costs for patients. However, DSOs are more likely to be found where population densities and average incomes are higher. These are not typically found in rural communities. We found that less than two percent of all DSO-affiliated full time equivalent (FTE) dentists practiced in rural areas.

Cost of dental services is also a significant barrier to access to dental care in rural communities. Cost is not measured simply by fee for services but is influenced by other factors such as the geographic distribution of dentists and population to provider ratios. Stated simply, more dentists in an area equals a lower population to provider ratio, which helps to lower cost. No solid criteria exist as to what the ideal population to provider

ratio should be, but our research indicated that 5,000:1 to 4,000:1 is con-

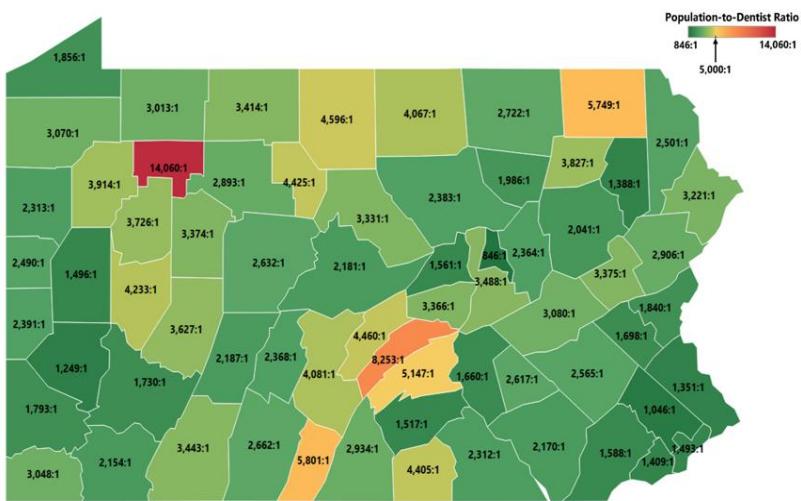


Figure 4: Nine rural counties have population-to-provider ratios above 5,000:1.

h indicated that 5,000:1 to 4,000:1 is considered adequate. Pennsylvania is fortunate to only have 12 counties exceed this top ratio, but nine of the counties are rural, which may limit the ability to obtain lower cost services in those areas.

Another barrier to dental care access presents itself for low-income patients that rely upon publicly funded insurance programs, like Medicaid. While many dentists accept Medicaid as a form of payment, we were informed that there is a distinction between accepting Medicaid and being a "meaningful provider," which is defined as billing \$10,000 or

more to Medicaid. Using this lens, rural communities are disadvantaged as there are many more (36 percent) meaningful providers in non-rural communities than rural communities, which again makes access an issue for rural residents.

Finally, we looked at emergency care access for dental-related issues in rural areas of the state. We hypothesized that these visits were increasing for rural residents given the lack of access to dentists. However, using emergency room hospital admission data, which we obtained from the Pennsylvania Health Care Cost Containment Council (PHC4), we found that during the period 2018-2021 admissions had declined by seven percent, while admissions in non-rural areas had increased by eight percent. Upon further investigation of the data and reviewing the results with experts, there are some possible explanations for this trend. In particular, the results may have been influenced by the relative age of the patients, the decline in the number of rural hospitals, and the increasing utilization of urgent care clinics.

There are several possible reasons why dentists are choosing to leave Pennsylvania, including lower salaries compared to neighboring states, lack of access to dental support personnel, and the number of out-of-state students attending dental school in the commonwealth.

Section V – Potential Strategies for Expanding Access to Dental Care

Overall, we found that expanding dental services accessibility to rural areas is a complex and multifaceted issue. While some policy options may have more direct impact than others, we believe that there is no single recommendation to be made that could immediately address the issue. However, we discovered that there are many different approaches that have been implemented throughout the commonwealth and in other states. Therefore, we recommend consideration be given to several approaches to the issue as highlighted below.

We examined strategies to boost the number and geographic distribution of dentists in the workforce. We found that there are several possible reasons why dentists are choosing to leave Pennsylvania, including lower salaries compared to neighboring states, lack of access to dental support personnel, and the number of out-of-state students attending dental school in Pennsylvania. Emerging research suggests there is a correlation between the location of origin of dental students and where they ultimately decide to practice after graduation. ADA studies have shown that in-state dental school students originally from rural areas are three times more likely to practice in rural communities upon graduation and are significantly less likely to leave the state to practice.² We conclude that if rural access to dental services continues to be problematic, there may be benefit in exploring strategies that will increase the number of rural students in dental schools.

Between 2019 and 2022, approximately 25 percent of all LRP award recipients were oral healthcare providers, but only a quarter of those grantees were practicing in rural areas.

We also discussed tuition assistance and reimbursement strategies that could incentivize providers to practice in rural areas. We reviewed the Primary Care Loan Repayment Program (LRP), a program administered by the Pennsylvania Department of Health (DOH) that can reimburse up to \$80,000 for providers (including dentists and dental hygienists) who choose to practice in shortage areas. We found that Pennsylvania is one of 37 states (including the District of Columbia) that publicly documented details regarding loan reimbursement programs, and that the LRP is comparable to initiatives used in other states. Between 2019 and 2022, approximately 25 percent of all LRP award recipients were oral healthcare providers, but only a quarter of those grantees were practicing in rural areas. While legislation was introduced during the 2021-2022 session of the General Assembly that would have expanded student loan forgiveness programs for Pennsylvania residents entering the field of dentistry, we found that a consistent drawback of loan reimbursement programs is the inability to convince providers to practice in rural areas for the long term. We offer several suggestions which could potentially strengthen student loan forgiveness programs, including expanding eligibility to current dental students, providing incentives for providers to extend their service in reimbursement programs, and increasing the time commitments for providers who wish to serve rural areas on a part-time basis.

Mobile dentistry and teledentistry have emerged as alternatives to expand access to basic dental services for rural Pennsylvanians. However, the lack of a regulatory environment for mobile dentistry and teledentistry, has made it difficult to quantifiably measure both methods of service. There are several advantages to including these methods of service in the existing oral healthcare model, including the ability to reduce travel burdens for patients, streamline services for dental offices, and reduce costs for both patients and providers. However, there are also challenges for

² Vujicic, Sarrett, and Munson, *Do Dentists from Rural Areas Practice in Rural Areas?* 2016.

mobile dentistry and teledentistry sustainable for rural areas. We found that the limitation of services offered, the ability to provide continued care, the availability of broadband internet, and long-term financial viability concerns could be disadvantageous for both models of service. As a first step, we recommend the General Assembly consider defining mobile dentistry and teledentistry to improve documentation efforts for private and public providers.

We explored other potential strategies that could be used to maximize the existing dentist workforce and improve access to oral healthcare services. Much like dentists, dental support professionals have also experienced their own set of workforce challenges. Although the number of professionals in these roles that require additional training (public health dental hygiene practitioners, expanded functional dental assistants) have been on the rise, overall, the dental support staff workforce in Pennsylvania has been decreasing recently. We believe this is primarily due to low compensation and pandemic-related workforce issues.

We also looked at how the integration of primary and oral healthcare could improve access to dental services in rural areas. For example, started in 2016, the Medical Oral Expanded Care (MORE Care) collaborative has trained and educated primary care staffs at 13 rural health clinics (RHCs) located in six counties³ on basic oral healthcare services, including administration of dental risk assessments, application of fluoride varnishes, and coordination with patients to set self-management oral healthcare goals. The collaborative was also one of the first programs in Pennsylvania to coordinate care between primary and oral healthcare providers. Expansion of similar programs could help to make inroads among patients who typically have been dissuaded from seeking dental treatment, which could help to reduce costs and improve overall health outcomes.

Finally, we reviewed several other innovative strategies from other states. These strategies include the integration of basic dental health concepts for community health workers and placing increased emphasis on oral health in educational settings. In our research, we found that states have looked to address a lack of dental services in rural areas in many unique ways. While we highlight several strategies applicable to the commonwealth, we encourage the General Assembly and oral health stakeholders to consider all policy options aimed at improving dental services access in rural Pennsylvania. We are encouraged that the Department of Health has begun to endorse many of these strategies in its *Pennsylvania Oral Health Plan 2020-2030*. Going forward, we recommend that this plan be used to guide the expansion of further rural dental health initiatives.

³ These counties are Cameron, Carbon, Crawford, McKean, Potter, and Schuylkill.

SECTION I OBJECTIVES, SCOPE, AND METHODOLOGY



Why we conducted this study...

House Resolution 68 was adopted by the House of Representatives on March 23, 2021.

The LBFC's Officers adopted the resolution as a staff project on April 7, 2021, with the following objectives:

- 1. Identify the availability of dental services in rural areas of Pennsylvania.*
- 2. Examine the costs and barriers to oral health services for residents who live in rural areas of Pennsylvania.*
- 3. Identify and discuss possible recommendations to expand oral health care services for rural Pennsylvanians.*

Introduction

On March 23, 2021, the Pennsylvania House of Representatives adopted House Resolution (HR) 68. This resolution pertains to the availability of dental health services in rural areas of Pennsylvania and further seeks recommendations to expand oral health care in those areas of the state. In response to HR 68 (see Appendix A), on April 7, 2021, the Officers of the Legislative Budget and Finance Committee (LBFC) adopted the resolution as a staff project.

Objectives

After a House or Senate resolution is adopted, as a matter of practice the LBFC's Officers also adopt objectives for the proposed study. Study objectives allow us to answer the requirements of the resolution more precisely, while also providing an outline from which to guide and plan the various study phases. The Officers of the Legislative Budget and Finance Committee (LBFC) approved the objectives that follow:

1. Identify the availability of dental services in rural areas of Pennsylvania.
2. Examine the costs and barriers to oral health services for residents who live in rural areas of Pennsylvania.
3. Identify and discuss possible recommendations to expand oral health care services for rural Pennsylvanians.

Scope

According to Government Audit Standards, issued by the Comptroller General of the United States through the Government Accountability Office (GAO), scope refers to the boundary of a study and is directly tied to

the audit objectives.⁴ Scope defines the subject matter that will be reported on, such as a particular program or aspect of a program, the necessary documents or records, and the period reviewed.

With respect to the period reviewed, our audit covered the period July 1, 2018, through December 31, 2021. In some areas, our scope may have preceded or extended beyond this period. These areas are noted in the report.

Methodology

A variety of sources and methods were used throughout this study. Over our research, we found that there is no single and complete source of dental providers and their locations of operation. We chose to use an extract of the Dentist Database Masterfile maintained by the American Dental Association's (ADA) Health Policy Institute (HPI). The ADA uses state licensure databases, death records, and dentist censuses to create the most extensive record of practicing and non-practicing dentists in the United States, and more specifically, Pennsylvania. Our data extract included records on all practicing dentists in Pennsylvania as of 2019, including available data on provider practice locations,⁵ education history, and key demographics, among other key data elements. The information is confidential, and we used only aggregated data for our exhibits. For the cross-dimensional analysis (age, practice location, educational history, etc.) and national comparisons used in this report, we found that the ADA Masterfile provides a conservative count by which to assess the dentist workforce in Pennsylvania. As a result, numbers we use in the report may differ from other data sources that did not have access to this proprietary data.

To account for dentists within the ADA Masterfile with multiple practice locations, we weighted each provider based on the number of locations they served. Dentists with a single practice location were assigned a full-time equivalent (FTE) weight of one. Providers with multiple practice locations received an FTE weighted value equivalent to the full weight divided by the number of locations they serve. For example, one dentist serving two practices would receive .5 FTE for each location. This methodology is consistent with the approach used by research experts at the ADA. Unless otherwise noted, the weighted value methodology is used wherever we analyze the geographic distribution of dentists as it helps to control for over counting the number of active providers.

⁴ See Comptroller General of the United State, Government Accountability Office, Government Auditing Standards, 2018 Revision, paragraph 8.10.

⁵ Some dentists chose to provide their residential address in lieu of a practice location. For the purposes of this report, we assume that residential addresses are valid substitutes when determining a dentist's approximate practice location.

We explored the distribution of dentists across the commonwealth from the ADA Masterfile in several ways. Using data from the United States Census Bureau, we analyzed the number of dentists per county in relation to each county's population. Another key component of our analysis was the geographic distribution of dentists based on the rural and non-rural classifications of each county in Pennsylvania. The Census Bureau updates its classifications following each census; however, classifications for the 2020 census were not published until December 2022.⁶ However, federal organizations such as the Department of Agriculture's (USDA) Economic Research Service (ERS)⁷ and the Department of Health and Human Services' (HHS) Office of Rural Health Policy (ORHP)⁸ update these classifications for research purposes. For this study, we used data from the last update in 2018.

In addition, we looked at the geographic distribution of dentists based on dental health professional shortage areas (DHPSAs) classifications. Maintained primarily by the Health Resources and Services Administration (HRSA) within the Department of Health and Human Services (HHS) at the federal level, these classifications are based on a scale of 0-26 based on criteria such as travel time, poverty levels, and population-to-provider ratios, among others. A full discussion on DHPSA classifications can be found in Section II.

Finally in relation to the ADA Masterfile, we analyzed the geographic distribution of dentists participating in Pennsylvania's Medicaid program, officially known as Medical Assistance (MA). To accomplish this task, we filtered our Masterfile data to only include records of providers who indicated to the ADA that they participated in Medicaid. We then compared this number of dentists by county to the total number of adults and children enrolled in the MA program in each county as reported by the Pennsylvania Department of Human Services (DHS).⁹

Outside of analysis conducted with the ADA Masterfile, we also explored emergency department (ED) visits by county. We obtained data from the Pennsylvania Health Care Cost Containment Council (PHC4), which is an independent state agency that collects and verifies inpatient hospital discharge and ambulatory/outpatient procedure records from hospitals and freestanding ambulatory surgery centers in Pennsylvania.¹⁰ Using PHC4's data, we obtained the number of ED hospital visits between 2018 and

⁶ See <https://www.census.gov/programs-surveys/geography/guidance/geo-areas/urban-rural.html>, accessed August 24, 2022.

⁷ See <https://www.ers.usda.gov/topics/rural-economy-population/rural-classifications/#map>, accessed August 24, 2022.

⁸ ORHP, *List of Rural Counties and Designated Eligible Census Tracts in Metropolitan Counties*, December 2018.

⁹ DHS oversees the Medicaid system in Pennsylvania. See also <https://www.dhs.pa.gov/about/Pages/DHS-Services-Map.aspx>, accessed October 4, 2022.

¹⁰ See <https://www.phc4.org/council/mission.htm>, accessed November 3, 2022.

2021 that had a diagnosis related to “diseases of the oral cavity and salivary glands” and “dentofacial anomalies.” This data was then grouped by patients’ county of residence for our analysis.

Finally, we supplemented our analysis with interviews and research from the ADA, the Pennsylvania Coalition for Oral Health (PCOH), the Pennsylvania Office of Rural Health (PORH), the National Conference of State Legislatures (NCSL), deans from several of the Pennsylvania-based dental schools, private oral healthcare providers, and other stakeholders. The material gleaned from these experts spans the breadth of this report, including information related to dentist and dental support staff education and workforce patterns, barriers to oral healthcare, and Medicaid claims billing criteria, among others. These resources were also particularly beneficial in identifying and assessing strategies to address dental services access issues in rural areas of the commonwealth.

Frequently Used Abbreviations and Definitions

Throughout this report, we use several abbreviations for government-related agencies, terms, and functions. These abbreviations are defined as follows:

Abbreviation	Name	Definition
DOS	Pennsylvania Department of State	The commonwealth agency responsible for the professional licensure of dentists in Pennsylvania.
Dentist	[Industry Term]	A licensed healthcare professional who diagnoses, treats, operates on, or prescribes for any disease, pain or injury, or regulates any deformity or physical condition, of the human teeth, jaws or associated structures.
ADA	American Dental Association	The world’s largest and oldest national dental association that is focused on supporting the success of dentists and the advancement of dental health among the public.
DDS or DMD	Doctor of Dental Surgery or Doctor of Dental Medicine	The professional titles granted to dentists upon completion of dental school. Both titles must fulfill the same degree requirements.
CODA	Commission on Dental Accreditation	An agency of the ADA that is recognized by the United States Department of Education as the sole entity responsible for accrediting postsecondary dental programs in the nation.
Dental Assistants	[Industry Term]	A licensed healthcare professional who performs dental support duties at the discretion of their supervising dentist.
EFDA	Expanded Function Dental Assistant	A licensed healthcare professional who performs functions under the supervision of a licensed dentist, such as coronal polishing, placing and condensing amalgam restoration and other restorative materials, fluoride treatments, including fluoride varnish, placing and removing rubber dams, among other functions.

Abbreviations Continued

Abbreviation	Name	Definition
Dental Hygienists	[Industry Term]	A licensed healthcare professional who may clean teeth, take dental x-rays, and provide other related dental services, all while under the direct supervision of a dentist.
PHDHP	Public Health Dental Hygiene Practitioner	A licensed dental hygienist who may perform educational, preventive, therapeutic, and intra-oral procedures without the direct supervision of a dentist.
FQHC	Federally Qualified Health Center	An outpatient medical clinic that qualifies for reimbursement under Medicare and Medicaid.
RHC	Rural Health Clinic	A healthcare facility that is intended to increase access to primary care services for patients in rural communities.
Rural	[Industry Term]	An area classified as nonmetro due to the existence of a combination of open countryside, towns with less than 2,500 people, or areas with populations between 2,500 and 49,999 people that are not part of larger metropolitan labor market areas.
Non-Rural	[Industry Term]	An area classified as metro due to the existence of urban areas with at least 50,000 people.
DHPSA	Dental Health Professional Shortage Area	A geographic area deemed to have a shortage of dental health professionals.
HRSA	Health Resources and Services Administration	An agency within the United States Department of Health and Human Services that is the primary entity responsible for determining health professional shortage areas in the United States.
DOH	Pennsylvania Department of Health	The commonwealth agency responsible for setting medical regulations and standards for dental healthcare in Pennsylvania.
Mobile Dentistry	[Industry Term]	A model to deliver select dental services through mobile dental vans or other portable means.
Teledentistry	[Industry Term]	A model to deliver select dental services remotely through online communications.
DHS	Pennsylvania Department of Human Services	The commonwealth agency responsible for overseeing the Medicaid and Medicare programs in Pennsylvania.
MA	Medical Assistance	The official name of the Medicaid and Medicare program in Pennsylvania.
PCOH	Pennsylvania Coalition for Oral Health	An advocacy group whose mission is to improve oral healthcare for the citizens of Pennsylvania.
PORH	Pennsylvania Office of Rural Health	An office formed through a partnership between the federal government, the commonwealth, and The Pennsylvania State University, that is tasked with improving the healthcare quality and health status of rural Pennsylvanians.
PHC4	Pennsylvania Health Care Cost Containment Council	Independent state agency that collects inpatient hospital discharge and ambulatory/outpatient procedure records from hospitals and free-standing ambulatory surgery centers in Pennsylvania.
DSO	Dental Service Organization	A group that owns or contracts with oral healthcare practices to manage business and non-clinical operations.

Acknowledgements

We thank staff from the Pennsylvania Coalition for Oral Health, including Executive Director Helen Hawkey, and the Pennsylvania Office of Rural Health, including Rural and Primary Care and Integration Coordinator Kelly Braun, for their assistance in completing this project. We also recognize staff from the American Dental Association, specifically Dr. Marko Vujicic, Chief Economist and Vice President, and Bradley Munson, Senior Research Analyst. In particular, the data these organizations shared with us was instrumental in completing much of the analysis for this project. We also thank representatives from Temple University's Maurice H. Kornberg School of Dentistry and the University of Pittsburgh School of Dental Medicine, who met with us and shared their insights on rural dental health initiatives. Finally, we thank the staff from the Pennsylvania Health Care Cost Containment Council, who provided us with certain hospital utilization data related to dental procedures.

Important Note

This report was developed by the staff of the Legislative Budget and Finance Committee, including project manager, Stephen Fickes and staff analyst, Matthew Thomas. The release of this report should not be construed as an indication that the Committee as a whole, or its individual members, necessarily concur with the report's findings, conclusions, or recommendations.

Any questions or comments regarding the contents of this report should be directed to the following:

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SECTION II BACKGROUND INFORMATION ABOUT DENTAL HEALTH



Fast Facts...

- ❖ *Dental and oral health are key indicators of well-being and quality of life.*
- ❖ *Although dentists are the primary provider of dental healthcare, there are several other providers, including hygienists, expanded function dental assistants, and public health dental hygiene practitioners.*
- ❖ *Rural and Non-rural county classifications developed by the federal government guide most of the analysis in this report. There are 30 counties defined as rural using this definition.*
- ❖ *Dental Health Professional Shortage Areas (DHPSA) are another important classification used to identify healthcare imbalances. There are 41 counties meeting this designation.*

Introduction

Anyone who has experienced a tooth ache can attest to the significance of dental health. In fact, the World Health Organization states that dental and oral health are key indicators of well-being and quality of life. Within the United States, according to the Centers for Disease Control and Prevention, dental and oral health has greatly improved since the 1960s, but not all Americans have equal access to these improvements. This section of the report provides additional background about dental health and presents contextual information for the discussions that follow regarding access to dental health services in rural areas of Pennsylvania.

Professions within Dental Health

As this report focuses on access to rural dental health services, it is important for readers to have a basic understanding of the dental health workforce. Unfortunately, it is not realistic to suggest that access issues can be immediately solved by creating more jobs in the field, as there are many educational and licensing requirements that must be met to be qualified for these positions. In the discussion that follows, we will briefly outline several of the core occupations within the field of dental healthcare, including the requirements necessary to be considered a licensed professional in Pennsylvania.

Dentists

The central figures in oral healthcare are dentists. The Pennsylvania Department of State (DOS) – the entity responsible for the professional licensure of dentists in the commonwealth – defines a dentist as “a licensed healthcare professional who diagnoses, treats, operates on, or prescribes for any disease, pain or injury, or regulates any deformity or physical condition, of the human teeth, jaws or associated structures.”¹¹

¹¹ See <https://www.dos.pa.gov/ProfessionalLicensing/BoardsCommissions/Dentistry/Pages/Dentist-Licensure-Requirements-Snapshot.aspx>, accessed August 22, 2022.

Although it is most common for oral healthcare providers to practice general dentistry, the American Dental Association (ADA)¹² does recognize 12 fields of dental specialties, including but not limited to, dental anesthesiology, oral and maxillofacial (bones and tissues of the lower face) surgery, orthodontics and dentofacial orthopedics (facial development), and pediatric dentistry.¹³ In this report, we will commonly refer to all these practitioners as “dentists” or “providers,” unless a topic area dictates we distinguish by specialty.

While the specific details can vary by state, the general process for becoming a dentist is similar across the United States. In the discussion that follows, we will briefly outline the process and requirements for becoming a licensed dentist in Pennsylvania.

Education. Typically, dentists are required to complete approximately eight years of higher education. Candidates must complete a three- or four-year undergraduate degree before admittance to dental school. Most dental school programs are four years in length, including two years of biomedical studies (anatomy, biochemistry, pharmacology, etc.) and two years of clinical and laboratory training.¹⁴ Upon graduation, students are awarded either a Doctor of Dental Surgery (DDS) or a Doctor of Dental Medicine (DMD).¹⁵ Providers wishing to further specialize are required to complete additional post-graduate education.

The Commission on Dental Accreditation (CODA), which sits within the ADA and is tasked with certifying predoctoral dental education programs, has accredited 70 dental schools in the United States.¹⁶ There are currently four accredited dental schools located in Pennsylvania, including some of the oldest and most historic dental programs in the country. These institutions are as follows:

- **Temple University Maurice H. Kornberg School of Dentistry.** Located in Philadelphia, the Temple University Kornberg School of Dentistry (hereafter Temple) was founded in 1863, making it the second-oldest dental school in the United States.¹⁷ The

¹² Founded in 1859, the ADA is the world’s largest and oldest national dental association and is focused on supporting the success of dentists and the advancement of dental health among the public. See <https://www.ada.org/about>, accessed August 22, 2022.

¹³ See <https://ncrdscb.ada.org/en/dental-specialties/specialty-definitions>, accessed August 22, 2022.

¹⁴ See <https://www.colgate.com/en-us/oral-health/dental-visits/dds-vs-dmd-what-is-the-difference#>, accessed August 22, 2022.

¹⁵ According to the ADA, although the titles differ, both DDSs and DMDs fulfill the same academic requirements set by the Commission on Dental Accreditation (CODA). Further, state licensing agencies across the country recognize both degrees as equivalent to practice general dentistry. See <https://www.ada.org/resources/careers/practicing-dentistry>, accessed August 22, 2022.

¹⁶ See <https://www.ada.org/resources/research/health-policy-institute/dental-education>, accessed August 22, 2022.

¹⁷ See <https://dentistry.temple.edu/about>, accessed August 23, 2022.

school offers a predoctoral DMD program, as well as seven other dental specialty disciplines of study.¹⁸

- **University of Pennsylvania School of Dental Medicine.** Located in Philadelphia, the University of Pennsylvania School of Dental Medicine (Penn) was founded in 1878.¹⁹ The school offers a predoctoral DMD program, as well as eight other dental specialty disciplines of study.²⁰
- **University of Pittsburgh School of Dental Medicine.** Located in Pittsburgh, the University of Pittsburgh School of Dental Medicine (Pitt) was founded in 1896.²¹ The school offers a predoctoral DMD program, as well as eight other dental specialty disciplines of study.²²
- **Lake Erie College of Osteopathic Medicine.** The Lake Erie College of Osteopathic Medicine (LECOM) School of Dental Medicine opened in 2012.²³ The school maintains a clinic location in Erie²⁴ for 50 fourth-year students undergoing clinical rotations.

Finally, DOS requires all practicing dentists to complete 30 hours of continuing education credits for each biennial license renewal.²⁵

Licensure. The State Board of Dentistry (Board) within the Bureau of Professional and Occupational Affairs of DOS establishes the licensure requirements for dentists in the commonwealth. Candidates are required to document their graduation from a CODA-accredited dental school, as well as pass a written examination – known as the National Board Dental Examination – and a clinical examination.

For licensure candidates that received their education from a nonaccredited dental school (e.g., foreign trained dentists), the Board requires they obtain additional training from an accredited program within the United

¹⁸ See <https://coda.ada.org/en/find-a-program/search-dental-programs#t=us&sort=%40codastatecitysort%20ascending>, accessed August 23, 2022.

¹⁹ See <https://www.dental.upenn.edu/about-us/>, accessed August 23, 2022.

²⁰ See <https://coda.ada.org/en/find-a-program/search-dental-programs#t=us&sort=%40codastatecitysort%20ascending>, accessed August 23, 2022.

²¹ See <https://www.dental.pitt.edu/125>, accessed August 23, 2022.

²² See <https://coda.ada.org/en/find-a-program/search-dental-programs#t=us&sort=%40codastatecitysort%20ascending>, accessed August 23, 2022.

²³ See <https://lecom.edu/about/history/>, accessed August 23, 2022.

²⁴ Although LECOM is based in Erie, the School of Dental Medicine is primarily located in Bradenton, Florida. In addition to the clinic in Erie, LECOM also operates an Orthodontics and Dentofacial Orthopedics program at Seton Hill University in Greensburg. See <https://lecom.edu/dentalclinics/erie/> and <https://coda.ada.org/en/find-a-program/search-dental-programs>, accessed August 23, 2022.

²⁵ See <https://www.dos.pa.gov/ProfessionalLicensing/BoardsCommissions/Dentistry/Pages/Dentist-Licensure-Requirements-Snapshot.aspx>, accessed August 22, 2022.

States. Licensed dentists from other states may receive licensure by credentials, if their state licensing board confirms that it reciprocates with Pennsylvania. Further, the Board allows licensed dentists from other states to temporarily practice in Pennsylvania if their license is active and in good standing (e.g., no disciplinary action or criminal convictions).²⁶

Dental licenses in the commonwealth remain active for two years, expiring on March 31 of every odd-numbered year. All dentists wishing to remain in active status must renew their license with the Board biennially. It is important to note that licensing extensions have been granted for numerous professions because of the COVID-19 pandemic.²⁷

Other Professional Fields in Dental Health

There are several other professions within the field of oral healthcare that support the work of dentists or that provide select healthcare services independently. These occupations have varying levels of education requirements and experience, which will be highlighted below. Each of these professions will be revisited throughout this report, as some advocates in the oral healthcare community believe that these positions can play a critical role in the expansion of dental care access to rural portions of the state.

Dental Assistants and Expanded Function Dental Assistants. Pennsylvania is like most states in that DOS does not outline many education or examination requirements for dental assistants. Dental assistants are required to pass the Dental Assisting National Board (DANB) Radiation Health and Safety examination and must complete child abuse recognition and reporting requirements that are approved by the Pennsylvania Department of Human Services (DHS). Most dental assistants perform duties that are at the discretion of their supervising dentist and acquire their training on the job.²⁸

Expanded function dental assistants (EFDAs) are like dental assistants in that they must work under the supervision of a dentist. EFDAs in Pennsylvania are allowed to perform additional oral healthcare services, including polishings and other restorative materials, fluoride varnishing procedures, and the removal of rubber dams, among other services.

Prospective EFDAs have two potential educational options that are recognized by DOS. The first avenue is for individuals to obtain a two-year associate degree from a dental assistant program offered by a United States Department of Education accredited institution. Candidates also

²⁶ Ibid.

²⁷ See <https://www.dos.pa.gov/Pages/COVID-19-Waivers.aspx>, accessed October 14, 2022, for a full listing of professions. Some of these extensions are ending as of October 31, 2022.

²⁸ DANB, *Pennsylvania Allowable and Prohibited Duties for Dental Assistants*, 2022.

have the option to attend a CODA-accredited dental hygiene school that offers at least 75 hours of clinical and didactic (instructive) restorative function training. EFDAs are also required to complete 10 hours of continuing education credits during their two-year licensure period.

Other licensure requirements and regulations for EFDAs vary slightly from that of dental hygienists. Whereas hygienists are required to pass a written and clinical examination, EFDAs are only required to pass a written test prior to certification. EFDAs licensed in reciprocating states may obtain a license by credentials in Pennsylvania, but DOS requires licensees to submit written verification outlining their good standing and scope of practice from every state in which they previously worked.²⁹ Out-of-state EFDAs may temporarily practice in Pennsylvania so long as they are in good standing with their respective state licensing boards.³⁰

Dental Hygienists. Dental hygienists are licensed healthcare professionals who may clean teeth, take dental x-rays, and provide other related dental services, all while under the direct supervision of a dentist. Prospective dental hygienists are required by DOS to complete a two-year associate degree from a dental hygiene school that has been accredited either by the U. S. Department of Education or CODA. In addition, hygienists are responsible for completing 20 hours of continuing education credits during the two-year licensure period.

Similar to dentists, candidates for dental hygienist licensure are required to pass both a written³¹ and clinical examination. DOS also permits licensure by credentials for hygienists with licenses in reciprocating states, as well as the temporary portability of out-of-state licenses given that individuals are in active good standing with their state licensing boards.³²

Public Health Dental Hygiene Practitioners. The Public Health Dental Hygiene Practitioner (PHDHP) is an emerging field within oral healthcare. A PHDHP is a licensed dental hygienist who may perform educational, preventive, therapeutic, and intra-oral procedures. These duties are all within the traditional skillset of a dental hygienist, but PHDHPs are licensed to perform these procedures **without** supervision or examination by a dentist – meaning that PHDHPs may practice independently in places such as federally qualified health centers (FQHCs), schools, and rural health clinics (RHCs), among other settings.

PHDHPs must complete the education (associate degree) and examination (written and clinical) requirements of a traditional dental hygienist.

²⁹ The requirements and regulations of EFDAs can vary by state.

³⁰ See <https://www.dos.pa.gov/ProfessionalLicensing/BoardsCommissions/Dentistry/Pages/Dental-Assistant-Expanded-Function-Licensure-Requirements-Snapshot.aspx>, accessed August 24, 2022.

³¹ The written examination is known as the National Board Dental Hygiene Examination.

³² See <https://www.dos.pa.gov/ProfessionalLicensing/BoardsCommissions/Dentistry/Pages/Dental-Hygienist-Licensure-Requirements-Snapshot.aspx>, accessed October 14, 2022.

To be certified as a PHDHP, candidates must submit documentation proving that they have completed 3,600 hours of practice as a licensed dental hygienist under the supervision of a licensed dentist.³³ Additionally, PHDHPs must devote five of the 20 hours of continuing education credits required of dental hygienists to courses regarding public health.

Like the other oral healthcare fields discussed above, PHDHPs licensed in other states may temporarily practice in Pennsylvania if they are in good standing with their respective state licensing boards. However, DOS indicates that it currently does not allow for licensure by credentials for out of state PHDHPs wishing to become licensed in the commonwealth.³⁴

Rural/Non-Rural Classifications in Pennsylvania

Defining rural and non-rural areas in Pennsylvania guides much of the information for this report. In the section that follows, we detail the research and analysis that we used to determine the population and access classifications for our analysis.

United States Census Bureau Classification

The United States Census Bureau updates its urban-rural classifications following each census; however, classifications for the 2020 census were not published until December 2022.³⁵ Federal organizations such as the Department of Agriculture's (USDA) Economic Research Service (ERS)³⁶ and the Department of Health and Human Services' (HHS) Office of Rural Health Policy (ORHP)³⁷ update these classifications for research purposes. The last update occurred in 2018.

According to ERS, studies of "rural America" are commonly conducted at the county level, as this is the most standard level for collecting and tracking economic and population data. ERS explains that to meet the rural (nonmetro) distinction, a county must have some combination of the following:

- Open countryside.

³³ This documentation must be signed and verified by a licensed dentist in the commonwealth.

³⁴ See <https://www.dos.pa.gov/ProfessionalLicensing/BoardsCommissions/Dentistry/Pages/Public-Health-Dental-Hygiene-Practitioner-Licensure-Requirements-Snapshot.aspx>, accessed August 24, 2022.

³⁵ See <https://www.census.gov/programs-surveys/geography/guidance/geo-areas/urban-rural.html>, accessed August 24, 2022.

³⁶ See <https://www.ers.usda.gov/topics/rural-economy-population/rural-classifications/#map>, accessed August 24, 2022.

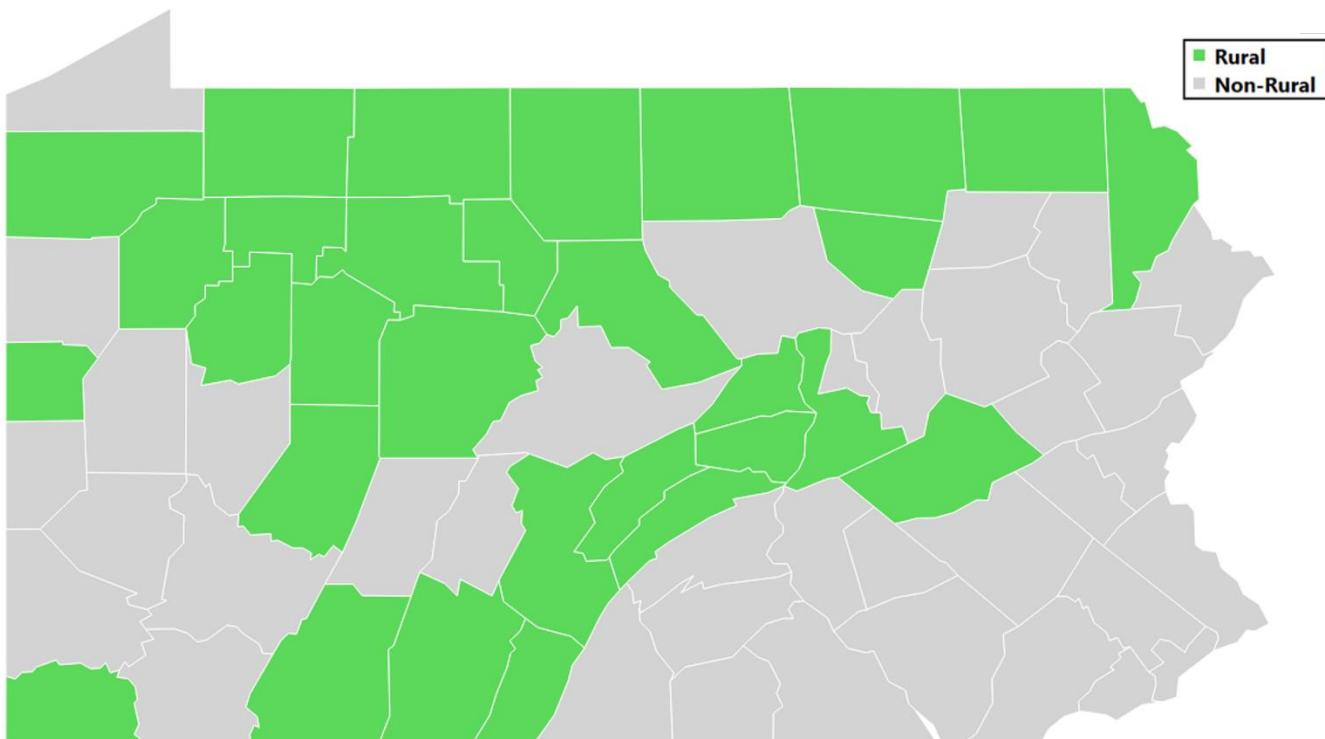
³⁷ ORHP, *List of Rural Counties and Designated Eligible Census Tracts in Metropolitan Counties*, December 2018.

- Towns with less than 2,500 people.
- Urban areas with populations between 2,500 and 49,999 people that **are not** part of larger metropolitan labor market areas.

Using the information produced by ERS and ORHP, we compiled a list of the rural and non-rural counties in Pennsylvania. It should be noted that we are using the term "non-rural" as opposed to "urban," since there are several instances where the urban label may not precisely fit the geographic or demographic profile of each county. As shown in Exhibit 1, there are currently 30 rural and 37 non-rural counties spread throughout the commonwealth.

Exhibit 1

The Federal Government Classifies 30 Counties as Rural



Source: Developed by LBFC staff from information provided by the United States Department of Agriculture and the United States Department of Health and Human Services.

Dental Health Professional Shortage Area Classifications

Dental health professional shortage areas are designations maintained by state and federal public health officials to track healthcare imbalances for the allocation of additional resources.

Another classification needing further description is “dental health professional shortage areas” (DHPAs). Shortage area designations are maintained by state and federal public health officials to track healthcare imbalances for the allocation of additional resources (funding, providers, etc.).³⁸ Shortage areas can be defined by geographic boundaries (county, census tract, township, etc.), the existence of specific population subsets (low income, Medicaid eligible, indigenous peoples, etc.), or by the presence of federal or other qualifying facilities (FQHCs, correctional institutions, state mental hospitals).³⁹

The Health Resources and Services Administration (HRSA) within the Department of Health and Human Services (HHS) is the primary entity responsible for determining shortage areas in the United States. For DHPAs, HRSA scores each area on a 0-26 scale to indicate the degree of need. As shown in Exhibit 2, HRSA scores are based on a variety of factors, including:

- A population-to-dentist ratio of at least 5,000:1 or a ratio of at least 4,000:1 in areas with unusually high need.
- The percent of the population living 100 percent below the Federal Poverty Level.
- The water fluoridation status of a specific area.
- The travel time to the nearest source of dental care.⁴⁰

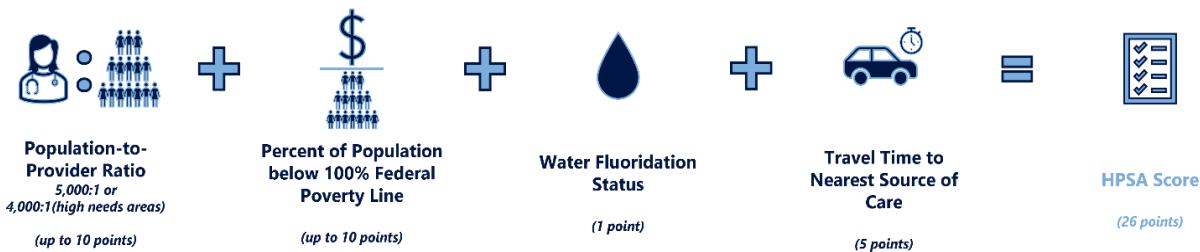
³⁸ See <https://www.ncsl.org/research/health/dental-health-professional-shortage-areas-and-access-to-care-post-card.aspx>, accessed August 24, 2022.

³⁹ See <https://www.hhs.gov/guidance/document/hpsa-and-muap-shortage-designation-types>, accessed September 20, 2022.

⁴⁰ See <https://bhw.hrsa.gov/workforce-shortage-areas/shortage-designation/scoring>, accessed September 20, 2022.

Exhibit 2

DHPSA Scoring Methodology



Source: Developed by LBFC staff from information provided by the United States Health Resources and Services Administration.

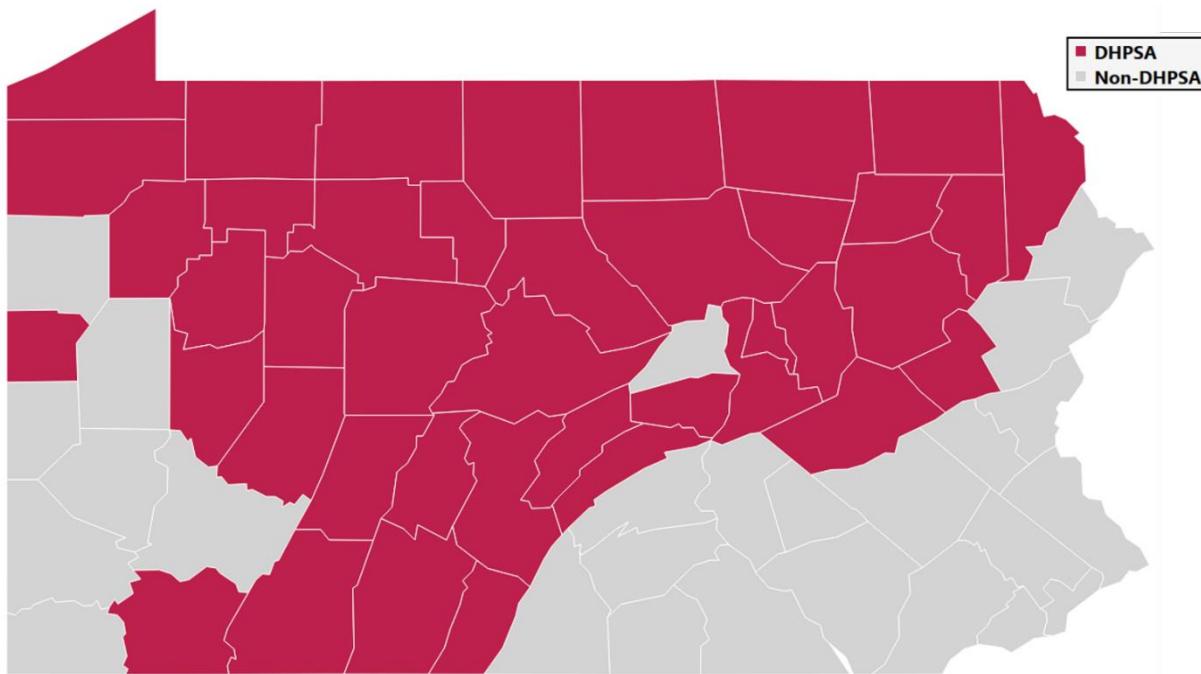
In addition, HRSA will typically include whether the DHPSA classification was driven primarily by geographic, population, or facility-based needs.⁴¹ Although DHPSA classifications can be made at more granular levels, we chose to examine these service areas at the county level. As such, we were able to obtain a listing of DHPSAs by county from open-source information maintained by the Pennsylvania Department of Health (DOH).⁴² As shown in Exhibit 3, there are currently 41 counties with the DHPSA designation in Pennsylvania. DHPSA classifications are not limited to rural areas, as there are 13 counties in the commonwealth that met the threshold to be considered non-rural, but that are also DHPSAs.

⁴¹ See <https://www.hhs.gov/guidance/document/hpsa-and-muap-shortage-designation-types>, accessed September 20, 2022.

⁴² See <https://www.health.pa.gov/topics/Documents/Health%20Planning/Dental%20Geo%20or%20Pop%20and%20Facility%20HPSA%20Map.pdf>, accessed August 24, 2022.

Exhibit 3

There are 41 Counties in Pennsylvania that are Classified as a DHPA



Source: Developed by LBFC staff from information provided by the Pennsylvania Department of Health.

Mobile Dentistry and Teledentistry

Advancements in technology have led to changes in healthcare practices that make consultation screenings and other limited treatments more attainable than ever. Oral healthcare researchers suggest that mobile dentistry and teledentistry can be used to expand access to basic dental services in rural areas. This section serves as an introduction of both concepts to inform the discussion of specific initiatives and policy considerations that will follow later in this report.

Mobile Dentistry

Although mobile dentistry initiatives have existed since the turn of the 20th century,⁴³ the practice has accelerated in recent decades as transportation technology has improved. Today, many mobile dental units

⁴³ Some of the earliest mobile dentistry programs involved providing preventative and educational services to children within the public school system. See Oral Health Workforce Research Center, *An Assessment of Mobile and Portable Dentistry Programs to Improve Population Oral Health*, 2017.

travel in vans equipped with dental working space, x-ray machinery, sterilization tools, and advanced computer systems.

The mobile dental model can offer patients many of same routine dental care and preventative services that are received in a brick-and-mortar facility. It is common for mobile units to offer dental exams and cleanings, dental sealant procedures, and preventative education services. More complex services such as root canals and oral surgeries are usually not offered, mobile units can typically provide screenings for these procedures that then can be used by dental care providers in more traditional settings.

Proponents of mobile dentistry view it as a mechanism to expand dental services to rural areas, because the units can be used to deliver dental services from population hubs to rural schools, outreach centers, and other areas that are not easily accessible. Further, the model has potential to reach patients who may not be able to travel easily, such as residents of nursing homes and long-term care facilities.⁴⁴

Teledentistry

In recent years, the rapid development of communications technology has given rise to the concept of telehealth. Telehealth broadly refers to the use of technology to deliver medical, health, and educational services to patients virtually. Teledentistry is a means by which to leverage online communications to delivery oral healthcare remotely.

Although more limited than traditional or mobile dentistry, teledentistry can provide patients with a variety of mechanisms to receive basic services. For example, live video conferencing can be used to provide basic consultation services without the patient having to leave their home. Further, asynchronous communications, such as pictures, videos, or mobile health monitors, can be used by providers to track patient progress without the need for an appointment visit.⁴⁵

Advocates suggest that teledentistry can be used to expand the reach of dentists from beyond their offices or clinics. Further, since individuals can be screened remotely, supporters argue that dentists can use these tools to streamline appointments, meaning patients from rural areas will need to travel for appointments less frequently. In addition, teledentistry has been viewed as a more affordable option than in-office visits. In turn,

Telehealth broadly refers to the use of technology to deliver medical, health, and educational services to patients virtually.

Teledentistry is a means by which to leverage online communications to deliver oral healthcare remotely.

⁴⁴ See <https://www.ruralhealthinfo.org/toolkits/oral-health/2/mobile-dental-services-model>, accessed August 25, 2022.

⁴⁵ See <https://www.ada.org/about/governance/current-policies/ada-policy-on-teledentistry>, accessed August 25, 2022.

this less expensive option could help to expand and improve dental hygiene among underserved populations.⁴⁶ The potential benefits of tele-health services have been brought into many mainstream healthcare discussions following the COVID-19 pandemic. As such, teledentistry has also gained support for its use in isolated and rural areas.

Status of Mobile Dentistry and Teledentistry Regulation

Since these methods of service are still emerging, it has been difficult to find data by which to quantifiably measure mobile dentistry and teledentistry. According to one stakeholder, it is difficult to assess mobile dentistry and teledentistry both in Pennsylvania and nationally because many states are not documenting information related to these service delivery methods.

One possible explanation as to why states are not documenting information on mobile dentistry and teledentistry could be the regulatory environment. We explored this issue further by reviewing how states regulate these services.

Mobile Dentistry. Although the concept of mobile dentistry has existed for nearly a century, information on mobile dentistry in its modern form is difficult to obtain. For example, we found several sources in our research which cite that 80 percent of state Medicaid programs provided reimbursement for mobile dentistry services as of 2013.^{47,48,49} However, efforts to track down a list of which states do (or do not) reimburse for mobile dentistry from these sources were unsuccessful.

The most comprehensive list of national mobile dentistry regulations we found comes from a 2017 report on the service model published by the University of Albany's (New York) Oral Health Workforce Research Center (OHWRC).⁵⁰ In this report, the OHWRC provides a review of state laws and regulations related to mobile dentistry as of 2017. We reviewed this information and grouped states into three categories: (1) states that do have formal mobile dentistry regulations; (2) states that reference mobile dentistry in guidelines or other public documentation; and (3) states that

⁴⁶ See <https://www.americanteledentistry.org/facts-about-teledentistry/>, accessed August 25, 2022.

⁴⁷ See <https://www.ncsl.org/research/health/boosting-oral-health-care-in-rural-communities.aspx>, accessed December 9, 2022.

⁴⁸ See <https://www.ruralhealthinfo.org/toolkits/oral-health/2/mobile-dental-services-model>, accessed December 9, 2022.

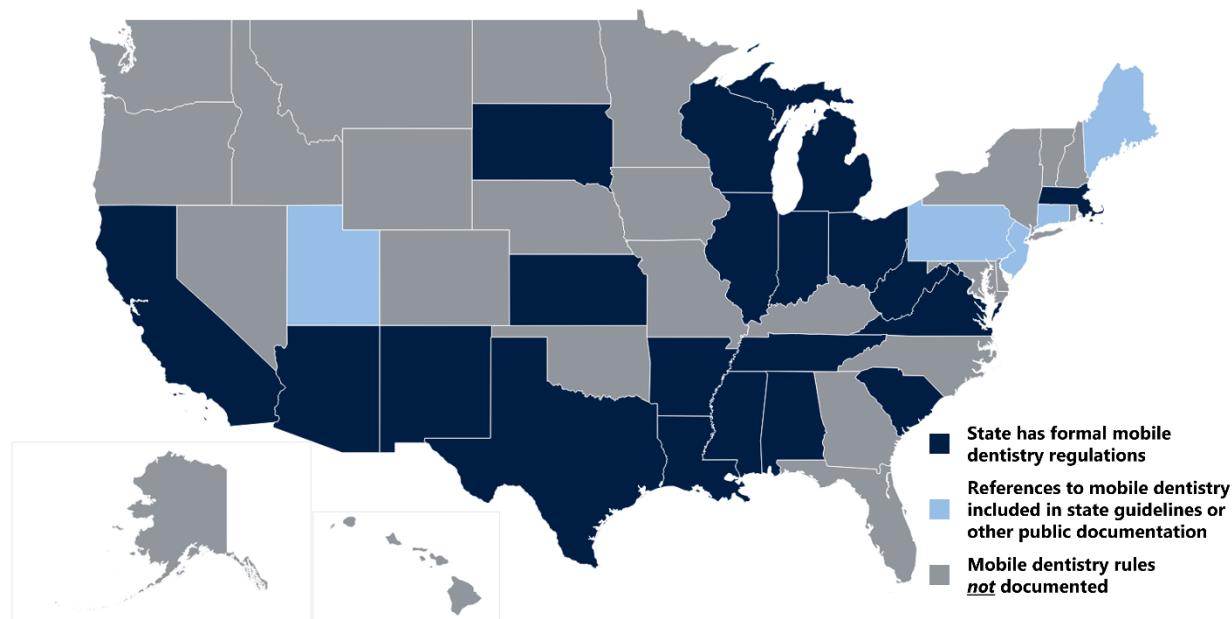
⁴⁹ Oral Health Workforce Research Center, *An Assessment of Mobile and Portable Dentistry Programs to Improve Population Oral Health*, 2017.

⁵⁰ Ibid.

do not document rules on mobile dentistry. The results of our review are illustrated in Exhibit 4 below.

Exhibit 4

Pennsylvania was One of 25 States to at Least Reference Mobile Dentistry in Public Documentation in 2017



Source: Developed by LBFC staff from information provided by the ADEA and the ADA.

Half of states across the country had no form of public documentation related to mobile dentistry as of 2017. Twenty states did have formal mobile dentistry regulations in place at the time of the OHWRC's report. We found that in most of these states, regulations were more "operational" as opposed to dental service focused. Specifically, regulations seem to focus less on the types of oral healthcare services that may be practiced under this method, and more so on the personnel, record-keeping, insurance, vehicle registration, and equipment requirements of mobile dental units.⁵¹

Pennsylvania is one of five states that reference mobile dentistry in state guidelines or other forms of public documentation. However, we found that references to mobile dentistry were rare, vague, and inconsistent across the commonwealth's regulations. For example, the most direct

⁵¹ Ibid.

reference⁵² to mobile dentistry comes in the definitions of allowable practice sites for dental hygienists within the State Board of Dentistry chapter of the Pennsylvania Code, which states that dental hygienists are allowed to practice "in public or private institutions such as schools, hospitals, public health care agencies, nursing homes, **mobile health units** and homes for juveniles, the elderly and the handicapped."⁵³ Nowhere in this chapter are mobile dental units referenced regarding dentists. Further, we found documentation from DOH stating that mobile dental units may be used to fulfill the examination requirements for children under the statewide School Dental Health Program, but this documentation does not provide additional definition for the qualifications of mobile dental units.^{54,55}

Although limited in quantity, most major health networks in Pennsylvania appear to have some form of mobile dentistry currently in practice, including a mobile clinic offered by the Penn School of Dental Medicine.^{56,57,58,59} However, it is still difficult to determine how widespread the practice of mobile dentistry currently is across the commonwealth. The most comprehensive snapshot of mobile dentistry in Pennsylvania comes from DOH's 2015 dental workforce survey, which found that less than one percent of both the dentist and dental hygienist populations were practicing in a mobile setting.⁶⁰

Teledentistry. Despite being the newer of these two methods of service, teledentistry has grown in prevalence in recent years. This is due, in large part, to the COVID-19 pandemic, as many practices needed to explore alternative methods of service to remain operational.⁶¹ However, even with its elevated prominence in a world that is increasingly shifting to methods of remote operation, the challenges with documenting and assessing teledentistry programs in Pennsylvania are similar to that of mobile dentistry.

The National Conference of State Legislatures (NCSL) maintains a scope of practice policy database that includes national snapshots of the regulatory environments for numerous professions and services within the

⁵² This is the reference flagged by the OHWRC in their 2017 report.

⁵³ 49 Pa. Code §33.205

⁵⁴ See <https://www.health.pa.gov/topics/school/Pages/Dental-Health.aspx>, accessed December 9, 2022.

⁵⁵ DOH, *Guidelines for the Dental Health Program for Pennsylvania's School-Age Population*, 2014.

⁵⁶ See <https://www.dental.upenn.edu/departments/division-of-community-oral-health/community-care-programs-landing-page/school-district-of-philadelphia-pennsmiles/>, access December 9, 2022.

⁵⁷ See <https://towerhealth.org/ronald-mcdonald-care-mobile-dental-program>, accessed December 9, 2022.

⁵⁸ See <https://www.geisinger.org/about-geisinger/news-and-media/news-releases/2020/09/04/20/44/geisingers-new-mobile-health-unit-delivers-dental-care-on-the-go>, accessed December 9, 2022.

⁵⁹ See <https://www.slhn.org/community-health/initiatives/mobile-youth-health-initiatives>, accessed December 9, 2022.

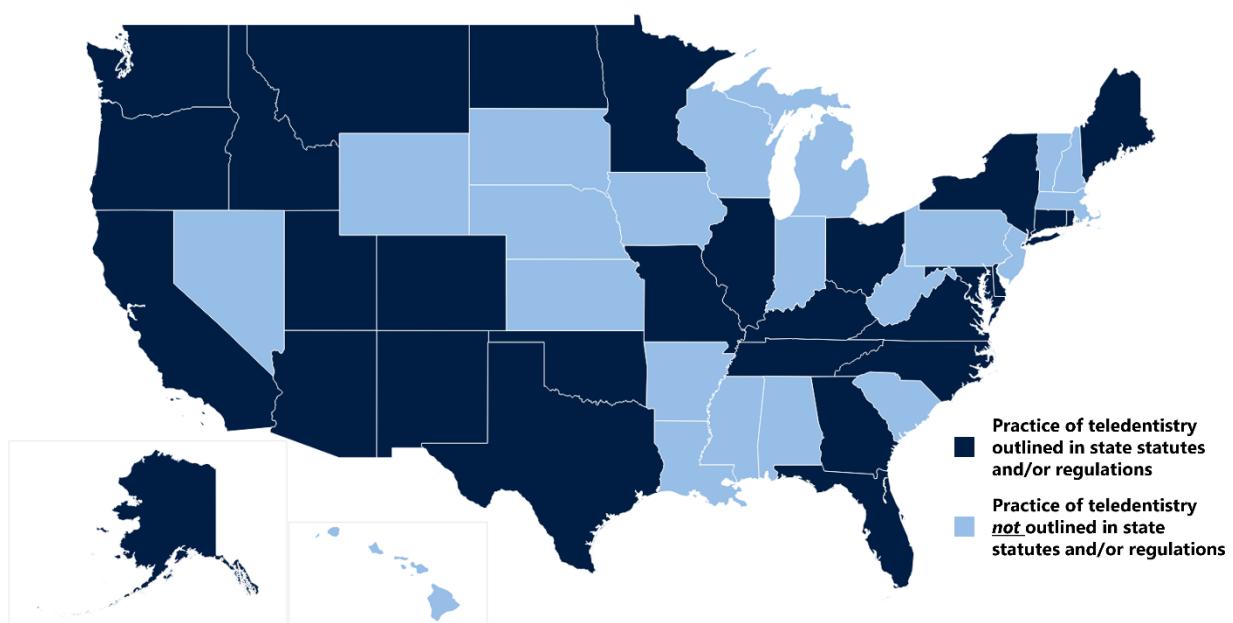
⁶⁰ The survey conducted by DOH found that 30 dentists and 31 dental hygienists were practicing in a mobile setting in 2015. Each profession had over 5,000 survey respondents. See DOH, *2015 Pulse of Pennsylvania's Dentist and Dental Hygienist Workforce*, 2018.

⁶¹ CareQuest Institute for Oral Health, *Provider Teledentistry Use Gains Traction During COVID-19*, 2020.

medical industry, including teledentistry.⁶² We used the information in this database to assess the policy approaches for teledentistry that were in use in Pennsylvania and across the country as of the database's publication in 2020. The results of our review are presented in Exhibit 5 below.

Exhibit 5

Pennsylvania was One of 21 States to Not Have Teledentistry Guidelines Outlined in State Statutes or Regulations in 2020



Source: Developed by LBFC staff from information provided by the NCSL.

As of 2020, 29 states had outlined the practice of teledentistry in state statutes or regulations. According to the information maintained by NCSL, the scope of teledentistry policies vary widely by state. While some states merely note that the practice of teledentistry is allowed or will be reimbursed under Medicaid, others provide detailed criteria for the dental services that can be provided virtually.⁶³ The remaining 21

⁶² See <https://scopeofpracticepolicy.org/practitioners/oral-health-providers/sop/practice-of-teledentistry/>, accessed December 12, 2022.

⁶³ For example, Oklahoma states, "teledentistry means the remote delivery of dental patient care via telecommunications and other technology for the exchange of clinical information and images for dental consultation, preliminary treatment planning and patient monitoring. A dentist holding a valid dental license in Oklahoma may consult, diagnose and treat a patient of record via synchronous or asynchronous telecommunication between the patient and dentist. The dentist must record all activities relating to teledentistry in the patient record and must have an office location in Oklahoma available for follow-up treatment and maintenance of records." See Oklahoma State Title 59 §328.3(34).

states did not have teledentistry policies formally outlined in statute or regulation.

At the time of publication for the NCSL's database, Pennsylvania was one of the 21 states that did **not** have teledentistry policies outlined in statute or regulation. However, this has since changed. In March 2020, the Pennsylvania Department of Human Services (DHS)⁶⁴ started to allow teledentistry services within the Medical Assistance (MA) program (Pennsylvania's Medicaid/Medicare program)⁶⁵ in response to the COVID-19 pandemic.⁶⁶ The use of teledentistry appears to have grown considerably in the commonwealth because of the pandemic. According to a survey conducted by the CareQuest Institute for Oral Health in August 2020, 42 percent of polled dentists in Pennsylvania were using teledentistry services.⁶⁷ DHS integrated teledentistry services into the MA fee schedule in May 2022.⁶⁸

DHS defines teledentistry as two-way, real-time interactive communication between patient and dentist.

Currently, DHS defines teledentistry as two-way, **real-time** interactive communication between patient and dentist. DHS allows dentists to bill the MA program for limited oral evaluations, topical fluoride varnish applications, and counseling and educational services rendered via teledentistry. These services are held to the same standards of care and documentation requirements as if they were delivered in person. Additionally, DHS notes that patients can opt-out of receiving teledentistry services at any time.⁶⁹

However, we have heard from stakeholders that it is difficult to accurately measure the use of teledentistry in the MA program. This is because, as we have noted, teledentistry is currently viewed as a **method to deliver services**, and not a **distinct set of services** itself. For example, the services offered via teledentistry are billed to the MA program using the same procedural codes as if the services were offered in person. As a result, one stakeholder informed us that the distinction between the two services is not always properly recorded during MA billing. From our review of the most recent MA fee schedule,⁷⁰ the only distinction made between teledentistry and in-person services is the code used to note where the services were delivered. However, as we did not have access to MA billing claims for this report, it is difficult for us to quantify the frequency of this occurrence since the MA fee schedule was updated in May 2022.

⁶⁴ DHS is the state agency that oversees the Medicaid and Medicare programs in Pennsylvania.

⁶⁵ In this report, we use the term "Medicaid" to broadly refer to the public health insurance system in the United States. The term "Medical Assistance (MA)" is used to denote the Medicaid and Medicare program in Pennsylvania.

⁶⁶ DHS, *Provider Quick Tips #237 Teledentistry Guidelines Related to COVID-19 for Dentists, Federally Qualified Health Centers, and Rural Health Clinics*, 2020.

⁶⁷ CareQuest Institute for Oral Health, *Provider Teledentistry Use Gains Traction During COVID-19*, 2020.

⁶⁸ DHS, *Medical Assistance Bulletin Number 08-22-13, 27-22-07*, 2022.

⁶⁹ Ibid.

⁷⁰ DHS, *Medical Assistance Program Dental Fee Schedule*, 2022.

SECTION III DENTAL SERVICES IN PENNSYLVANIA



Fast Facts...

- ❖ There were over 7,000 dentists practicing at 6,800 locations in Pennsylvania in 2019.
- ❖ The number of dentists as a proportion of the state's population decreased by seven percent since 2001. As of 2021, there were 58.1 dentists for every 100,000 residents.
- ❖ Access to Medicaid participating dentists in rural areas is an area of concern. On average, there were 2,575 Medicaid recipients for every one Medicaid dentist in rural counties. This compares to a ratio of 1,846:1 in non-rural areas.

Overview

Understanding access to dental services in Pennsylvania, and more specifically rural areas of Pennsylvania, begins with identifying where dental providers are located. In this section, we discuss both the number and geographic distribution of dentists across Pennsylvania, as well as how the location of providers can inhibit access to services for select areas and population groups.

Because there is no single and complete data source for dental providers and their locations of operation, we used several sources to create a comprehensive analysis for the scope of this study. With the assistance from the American Dental Association (ADA), we determined that there were over 7,000 licensed dentists actively operating across 6,800 practice locations in Pennsylvania in 2019. In addition, we determined that the number of dentists per capita has decreased by 7 percent over the 20-year period between 2001 and 2021. When we compared the geographic distribution of dentists based on the number and location of dental offices,⁷¹ we found that the number of providers in non-rural counties outpaced those in rural areas at a ratio of 15:1, and dentists in non-shortage areas outnumbered those in designated DHPSAs at a rate of 5:1.⁷²

Another important topic related to dental accessibility is the ability of rural residents to access dental services that are provided through the state's Medical Assistance (MA) program (Pennsylvania's Medicaid/Medicare program).⁷³ This issue is important because if Medicaid recipients have only limited access to MA participating dentists, then there is an even further disconnect between providers and the availability of services, regardless of how many dentists serve a rural (or non-rural) area.

⁷¹ As will be discussed later in this section, we weighted each dentist listed in the records obtained from the ADA by the number of practice locations they maintained. This number was used when comparing the geographic distribution of dentists across Pennsylvania, thereby limiting the overcounting of providers.

⁷² A Dental Health Professional Shortage Area (DHPSA) are designations used by public health officials to track healthcare imbalances for the allocation of additional resources (funding, providers, etc.). Dental shortage areas are scored on a variety of factors, including provider-to-population ratios, poverty levels, water fluoridation status, and travel times to receive dental care. There are currently 41 counties with the DHPSA designation in Pennsylvania. Please refer to Section II for additional background on DHPSAs.

⁷³ In this report, we use the term "Medicaid" to broadly refer to the public health insurance system in the United States. The term "Medical Assistance (MA)" is used to denote the Medicaid and Medicare program in Pennsylvania.

To this point, we compared ADA records to publicly available MA enrollment data from the Department of Human Services (DHS) and found that – on average – rural counties have 39 percent more MA recipients for every dentist participating in Medicaid than non-rural areas of the commonwealth.

A. Availability of Pennsylvania Dental Providers

As guided by HR 68 and our study's objectives, a primary task was to identify the availability of dental services in rural areas of Pennsylvania. Although this task seems straight-forward, finding complete data to answer the query proved to be difficult. For example, dental services can be provided by several different providers (e.g., hygienists, dentists, specialists, etc.). Further, although licensure information, Medicaid enrollment, and other similar files are maintained by commonwealth agencies, these databases often lag life events that impact one's practicing status, such as migrations, retirements, or deaths. Cross referencing these databases proved to be a challenge for our study. We found that – even among similar databases from different years – records varied, including variations in names (e.g., John Doe versus John A. Doe), provider identification numbers,⁷⁴ or practice locations.

Number of Active Dentists in Pennsylvania

For the purposes of this analysis, we focused solely on dentists. Our reasoning for this decision is that a dentist is typically the primary care provider for oral health services. We also met with researchers from the American Dental Association (ADA), who were able to share with us an extract of the Dentist Database Masterfile maintained by the Health Policy Institute (HPI) within the ADA. The ADA uses state licensure databases, death records, and dentist censuses to create the most extensive record of practicing and non-practicing dentists in the United States, and more specifically, Pennsylvania.

Our data extract included records on all practicing dentists in Pennsylvania as of 2019, including available data on provider practice locations,⁷⁵

⁷⁴ Although states can also have their own unique identifiers, the most standard form of identification is the National Provider Identifier (NPI), which is the unique identification number given to all covered health care providers in the United States. However, in our review of provider files, we found that it was not unusual for a single provider to have several NPI numbers listed, based on the number of practices or health plans in which the provider participated. See <https://www.cms.gov/Regulations-and-Guidance/Administrative-Simplification/NationalProvIdentStand>, accessed September 15, 2022, and <https://nppes.cms.hhs.gov>, accessed September 15, 2022.

⁷⁵ Some dentists chose to provide their residential address in lieu of a practice location. For the purposes of this report, we assume that residential addresses are valid substitutes when determining a dentist's approximate practice location.

education history, and key demographics, among other key data elements. The information is confidential, and we used only aggregated data for our exhibits.

As shown in Exhibit 6, our analysis found that in 2019 there were 7,421 licensed dentists practicing in 6,808 unique locations across Pennsylvania, which correlates with other research conducted by Pennsylvania dental health stakeholders.⁷⁶

Exhibit 6

There were over 7,000 Licensed Dentists Practicing in Pennsylvania in 2019



7,421 Dentists



6,808 Unique Locations

Source: Developed by LBFC staff from information provided by the ADA.

Number of Active Dentists Based on Population

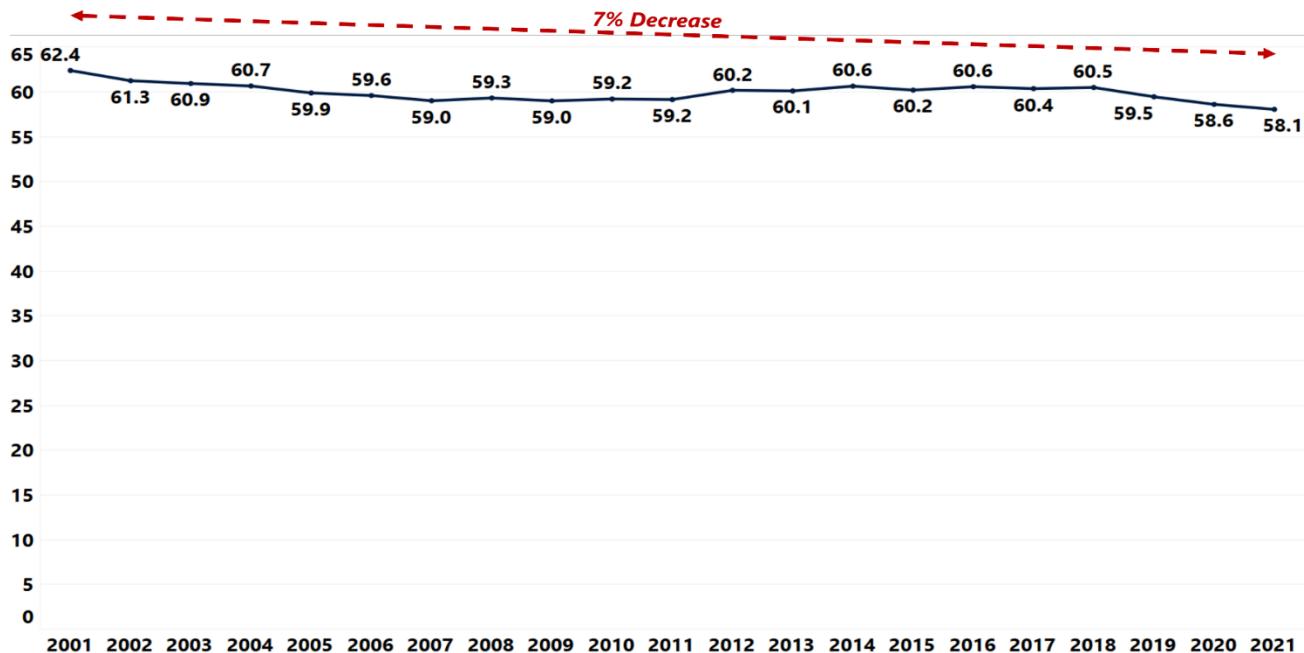
Another important metric is the supply of dentists in the workforce compared to the number of people they serve. To answer this question, we used existing analysis from the ADA, which calculated the number of dentists in each state based on population (per 100,000 residents).⁷⁷ As shown in Exhibit 7, we plotted this data for a 20-year period dating back to 2001, thereby presenting a long-term workforce trend for dentists.

⁷⁶ Using a modified dataset for 2020, the PA Coalition for Oral Health (PCOH) and the ADA reported 7,381 dentists in their report, *Access to Dental Care in Pennsylvania*, 2021.

⁷⁷ See <https://www.ada.org/resources/research/health-policy-institute/dentist-workforce>, accessed October 3, 2022.

Exhibit 7

The Number of Dentists per 100,000 Residents in Pennsylvania has Decreased by 7 Percent Since 2001



Source: Developed by LBFC staff from information provided by the ADA.

Since 2001, the number of dentists per 100,000 residents has declined by seven percent. Although there were several years with increases,⁷⁸ the trend of dentists in Pennsylvania was consistently negative, with provider ratio declines in 14 of the 20 years measured. In addition, some of the most dramatic declines have come in recent years. For example, from 2018-2020, the number of dentists decreased by nearly two providers per 100,000 residents, or a decrease of over three percent.

The above trend can be explained by two diverging factors: a decrease in dentists and an increase in population. For example, the number of dentists practicing in Pennsylvania has declined by approximately 2 percent from 2001 to 2021. Conversely, over the same period, the commonwealth's population has increased by nearly 1.5 percent.

The high-level trends within the dental provider workforce serve as an important introduction to the conditions currently facing the oral healthcare industry in the commonwealth. We will further explore these trends throughout this report, including discussions on the geographic distribution of dentists across the state, projections for the workforce

⁷⁸ Years with growth in the number of dentists per 100,000 people were 2008, 2010, 2012, 2014, 2016, and 2018.

changes in the commonwealth, and comparisons of Pennsylvania's standing to the industry's national outlook.

B. Geographic Distribution of Dentists

Geographic distributions inform discussions about potential service delivery weaknesses. To accomplish this task, we looked at the geographic distribution of dentists based on the practice locations included in the ADA's Masterfile. Although most of our analysis was performed at the county level, our mapping locations were based on the dental practices' zip codes, as this was the most granular level available to us that would still maintain the confidentiality of the records within the dataset.

In addition, we also considered dentists that service multiple practice locations, as they – at least in theory – would not be able to devote as much time to each location as dentists with a single location. As such, we weighted each provider based on the number of locations they served. Dentists with a single practice location were assigned a full-time equivalent (FTE) weight of one. Providers with multiple practice locations received an FTE weighted value equivalent to the full weight divided by the number of locations they serve. For example, one dentist serving two practices would receive .5 FTE for each location. This methodology is consistent with the approach used by research experts at the ADA.⁷⁹

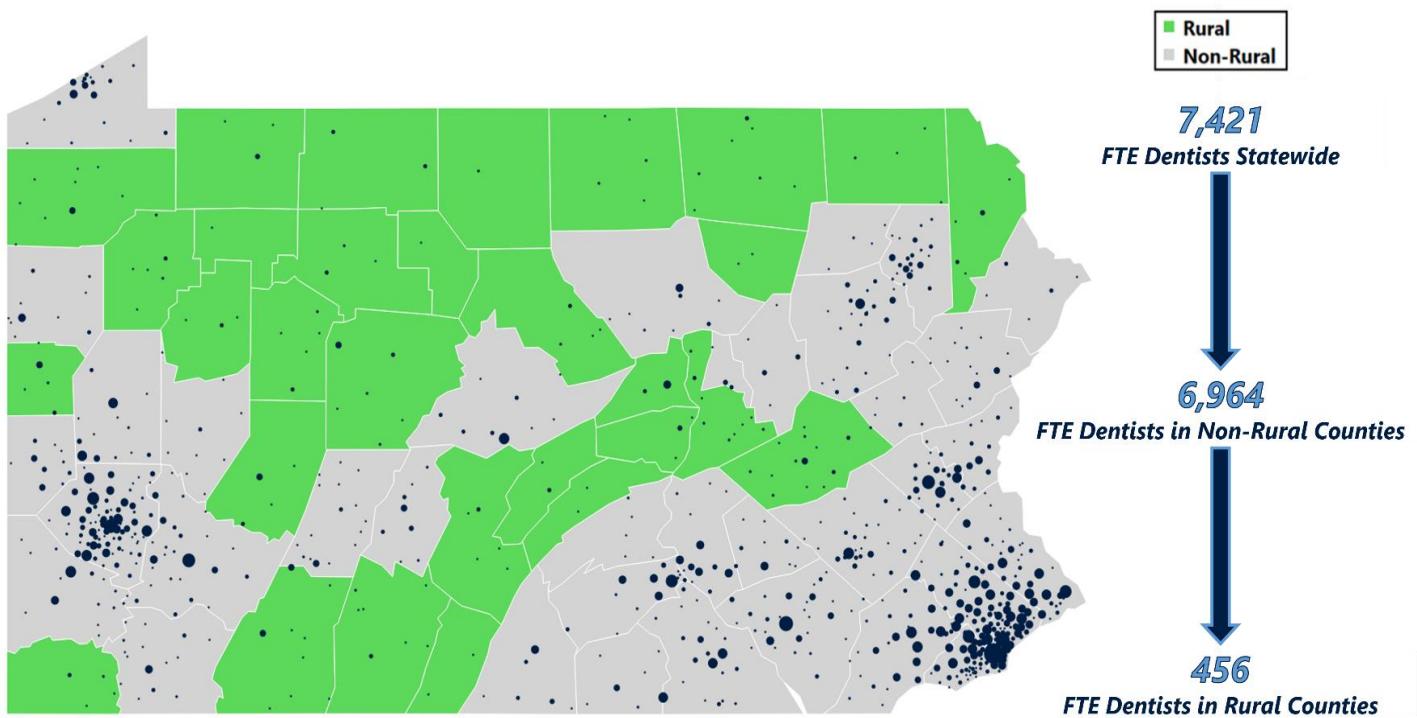
Distribution of Dentists from Rural and Non-Rural Areas

First, we examined the location of dentists against rural/non-rural county classifications (see Section II). This analysis is visually illustrated in Exhibit 8, with the size of each circle indicating the number of FTE dentists operating locations within a zip code (e.g., larger circles represent more dentists; smaller circles represent fewer dentists). In addition, full county profiles with the results from the ADA Masterfile can be found in Appendix B.

⁷⁹ Unless otherwise noted, the weighted value methodology will be used wherever we analyze the geographic distribution of dentists in this report, as it helps to prevent from over counting the number of active providers throughout the state.

Exhibit 8

**The Ratio of Dentists from Non-Rural Counties
to Rural Counties is More Than 15 to 1***



Note:

*/ One dentist did not provide location information; thus, totals are off by one.

Source: Developed by LBFC staff from information provided by the ADA.

As noted in Issue Area A, in 2019, there were 7,421 practicing dentists in Pennsylvania, which equates to approximately 111 dentists per county.⁸⁰ However, analyzing the distribution of dentists between rural and non-rural areas paints a much different picture. For example, there were 6,964 FTE dentists operating in non-rural counties in 2019. Conversely, there were only 456 FTE dentists practicing in rural counties. As a result, the ratio of non-rural to rural dentists is 15:1. Stated differently, there are 15 non-rural dentists for every one practicing rural dentist. On average, there were 188 FTE dentists per non-rural county, which is a stark contrast to the average of 15 FTE providers for every rural county.

As shown on Exhibit 8, the largest clusters of dentists, as well as the greatest number of dentists per zip code, surround the commonwealth's

⁸⁰ There was also one dentist that did not provide a practice location or residential address, which was not included as part of this analysis.

major population hubs in Philadelphia and Pittsburgh. Indeed, we found that the five counties with the most (FTE) dentists are as follows:

- Philadelphia (1,061.4);
- Allegheny (973.5);
- Montgomery (793.7);
- Bucks (465.2); and
- Delaware (402.2).

For comparison, Schuylkill County has the most FTE dentists among rural counties with 45.8. Not surprisingly, the counties with the fewest number of dentists are also some of the most rural:

- Forest (0.5);
- Cameron (1);
- Fulton (2.5);
- Juniata and Sullivan (3 each); and
- Potter (3.6).

However, there are several examples of counties that are classified as non-rural but have unusually low numbers of dentists practicing in their jurisdictions. Wyoming County (7) and Perry County (9) have low counts of practicing dentists relative to other non-rural counties. Upon further review, we found that, although both counties have population bases that would be classified as rural (27,000 and 46,000 in 2019, respectively), both counties are considered non-rural due to their proximity to the Scranton—Wilkes-Barre (Wyoming) and Harrisburg—Carlisle (Perry) metropolitan statistical areas.⁸¹

While these numbers are informative, they should also be viewed within the context of access. In Section IV, we will explore how the geographic distribution of dentists impacts access to care for citizens of rural Pennsylvania.

Distribution of Dentists based on Dental Health Professional Shortage Area Designations

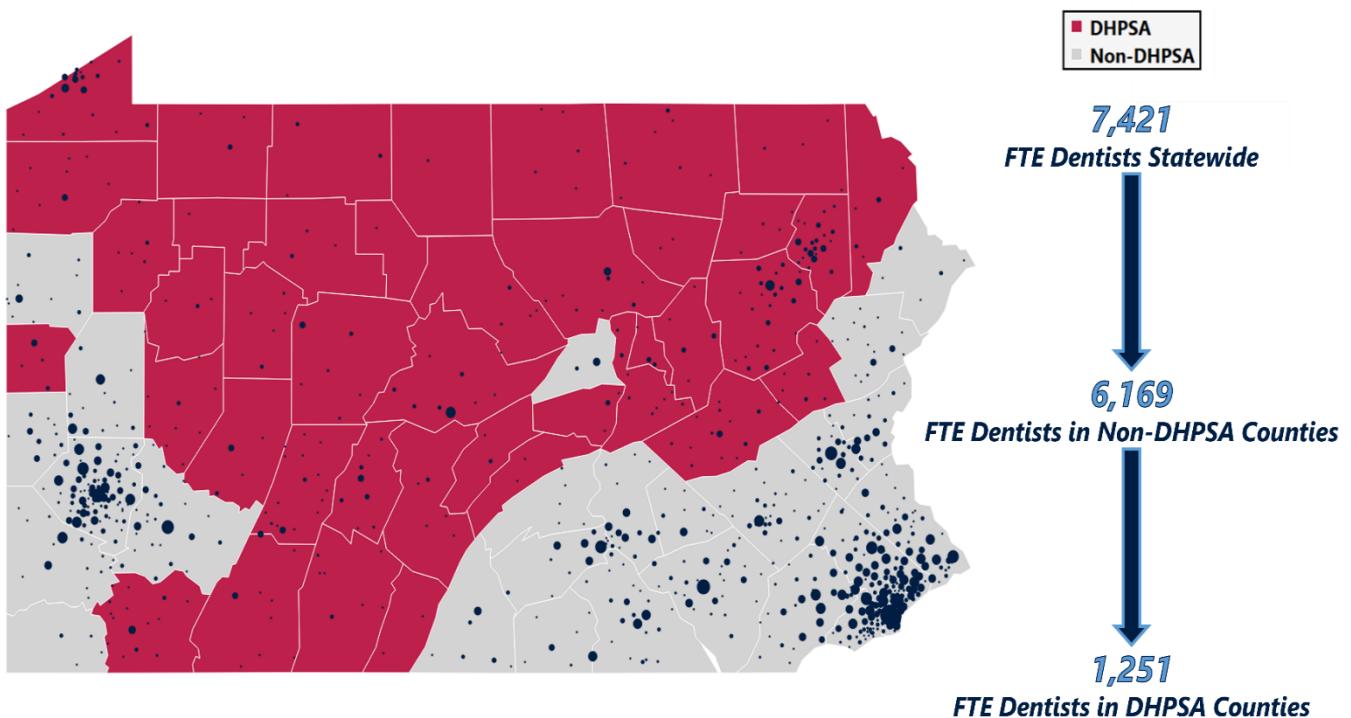
In Section II we introduced the concept of Dental Health Professional Shortage Areas (DHPSA) and highlighted that DHPSAs are areas where imbalances in healthcare access exist, largely due to the lack of availability of resources (providers, financial barriers, etc.). As such, large disparities appear when comparing the location of dental practices between DHPSAs and non-shortage areas of the state.

⁸¹ U.S. Census Bureau, *Pennsylvania: 2020 Core Based Statistical Areas and Counties*, 2020.

Similar to the analysis above, we overlaid our map of dental practice locations against the DHPSA classifications introduced in Section II. The results are presented in Exhibit 9 below.

Exhibit 9

There were 5 Times as Many Dentists in non-DHPSA Counties as Opposed to DHPSA Counties in 2019*



Note:

*One dentist did not provide location information; thus, totals are off by one.

Source: Developed by LBFC staff from information provided by the ADA.

We found that dentists are spread more prevalently across non-shortage areas of the state. In 2019, there were approximately five dentists practicing in non-DHPSA locations for every one dentist operating within a DHPSA. Overall, most of the findings of this analysis were not surprising, as it was expected that counties labeled as provider shortage areas would have significantly fewer dentists than those counties that are not shortage designated. Although the difference is still quite large, it is logical that the provider gap between DHPSA and non-DHPSA counties would be smaller than the difference between non-rural and rural areas. As noted in Section II, since DHPSA designations are based, in part, on ratios of providers to population, there are 13 non-rural counties that

have been designated as shortage areas, which as a result can inflate the total number of dentists practicing within DHPSA counties.

Even within DHPSA counties, the distinction between rural and non-rural counties is stark. Among the 13 non-rural DHPSA counties, there were a total of 835.3 FTE dentists practicing in 2019, or approximately 64 per county. The 28 rural DHPSA counties, on the other hand, had a total of 415.8 FTE dentists, which is the equivalent of slightly less than 15 providers in each county.

Approximately 99 percent of providers practicing in non-DHPSA counties are located in non-rural portions of the state.

By far, dentists are most abundant in non-rural, non-DHPSA counties. For example, of the 6,169 providers practicing in non-DHPSA counties, 99 percent (6,128.6) are located in non-rural portions of the state. In fact, only two rural counties – Union (28.5) and Greene (11.8) – had adequate numbers of practicing dentists to not be classified as DHPSAs.

However, these two counties' (Union and Greene) status as rural and non-DHPSA may be explained by other variables. For example, despite the counties' relatively smaller population bases (45,000 and 36,000, respectively), each is also home to a university. As a result, additional providers may be drawn to these areas to meet the population needs. In fact, upon further analysis, we found that 68 percent of the dentists in Greene County are located in Waynesburg (home to Waynesburg University) and 88 percent of the dentists in Union County reside in Lewisburg (home to Bucknell University).⁸²

Geographic Distribution of Dentists Participating in Medical Assistance

Studies have shown that among all healthcare services, dental care has the greatest financial barriers; subsequently, low-income adults are also the least likely to receive oral healthcare services.⁸³ We looked at this issue further by first understanding where lower income residents may have difficulties accessing oral healthcare services.

To accomplish this task, we analyzed the geographic distribution of dentists who indicated that they participated in the Medical Assistance (MA) program⁸⁴ in Pennsylvania as of 2019. We then used our FTE location scale to aggregate the total number of dentists with practice sites in each county, and then compared this value to the total number of adults and

⁸² In Fall 2021, Bucknell University had an enrollment of 3,810 students, while Waynesburg University had an enrollment of 1,182 students. See <https://www.bucknell.edu/news/bucknell-breaks-application-record-second-straight-year#:~:text=The%20University%20began%20the%20current,17%2C202021>), accessed September 16, 2022, and <https://www.usnews.com/best-colleges/waynesburg-3391#:~:text=It%20has%20a%20total%20undergraduate,tuition%20and%20fees%20are%20%2428%2C490>, accessed September 16, 2022.

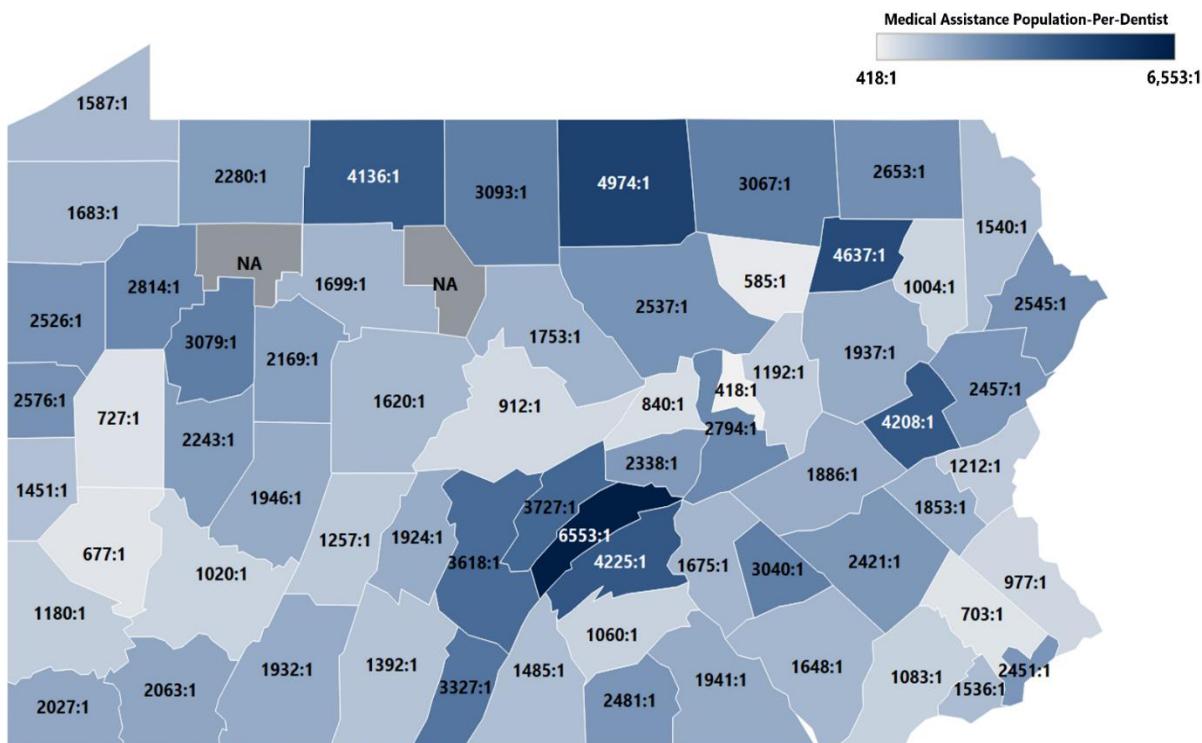
⁸³ ADA, *Making the Case for Dental Coverage for Adults in All State Medicaid Programs*, 2021.

⁸⁴ In this report, we use the term "Medicaid" to broadly refer to the public health insurance system in the United States. The term "Medical Assistance (MA)" is used to denote the Medicaid and Medicare program in Pennsylvania.

children enrolled in the MA program in each county as reported by the Pennsylvania Department of Human Services (DHS).⁸⁵ Exhibit 10 below shows the geographic distribution of dentists who accept Medicaid compared to the MA population across Pennsylvania.

Exhibit 10

**Medical Assistance Recipients per Medicaid Dentist
are Greater in Rural Counties**



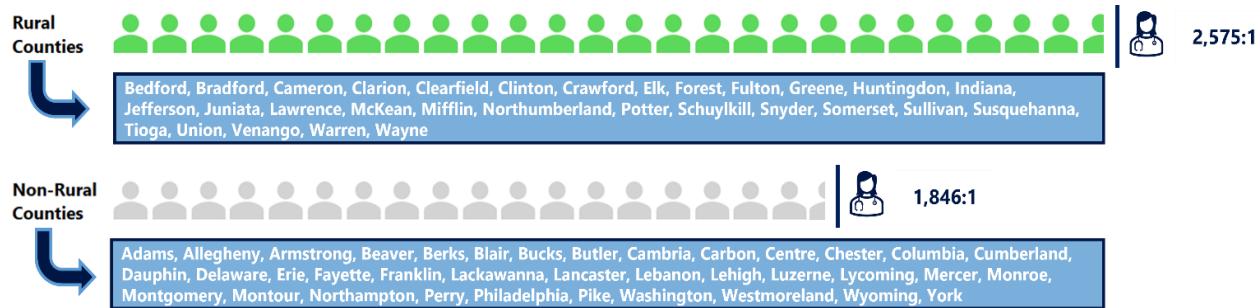
Source: Developed by LBFC staff from information provided by the ADA and DHS.

We found that there was an average of 2,160 MA recipients for every one dentist that accepts Medicaid across the commonwealth. However, the distribution of dentists is skewed towards non-rural areas of the state. For example, as shown in Exhibit 11, in non-rural counties, there was an average of 1,846 MA recipients for every one Medicaid accepting dentist. Yet, among rural counties, the same proportion was considerably higher at 2,575:1, or an increase of 39 percent over non-rural counties.

⁸⁵ DHS oversees the Medicaid and Medicare system in Pennsylvania. See also <https://www.dhs.pa.gov/about/Pages/DHS-Services-Map.aspx>, accessed October 4, 2022.

Exhibit 11

Rural Areas Have 39 Percent More Medical Assistance Recipients per Medicaid Dentist than Non-Rural Areas



Source: Developed by LBFC staff from information provided by the ADA.

The results of this analysis reveal a greater challenge for rural areas of the state. For example, despite there being significantly more MA recipients in non-rural areas of the state,⁸⁶ the greater concentration of dentists in these counties⁸⁷ creates the opportunity for better access to care for the MA populations as opposed to those in rural areas. These calculated population-to-provider ratios are useful for comparative purposes and identifying the availability of dental services in Pennsylvania. We will explore how DHS measures the adequacy of its Medicaid network in Section IV.

⁸⁶ From the DHS data we were able to obtain, we calculated that there were over 4 million MA recipients in Pennsylvania's 37 non-rural counties. This is compared to the 500,000 recipients across the 30 rural counties of the commonwealth.

⁸⁷ We calculated over 2,800 FTE dentists that accept Medicaid in non-rural counties, as opposed to 234 in rural counties.

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SECTION IV

COSTS AND BARRIERS TO DENTAL CARE FOR RURAL COMMUNITY POPULATIONS



Fast Facts...

- ❖ Dentists practicing in rural areas have declined by 15 percent per 100,000 population between 2010 and 2020.
- ❖ “New” dentists are not backfilling the rate at which providers are leaving the dental field. This trend is especially troubling in rural areas of the state.
- ❖ Dental Service Organizations (DSOs) offer benefits to patients and providers, yet few of these organizations are found in rural areas.
- ❖ Because there are fewer dentists serving rural communities, residents in these areas often face higher costs, whether using public or private insurance.

Overview

For residents residing in rural communities, the primary obstacle to dental care is access to a dentist. In this section of the report, we build on the discussion presented in Section III and further discuss the current “supply” of dentists serving rural communities, which has fallen by 15 percent (per 100,000 population) between 2010 and 2020.

In evaluating the current and projected supply of dentists, we did so with an eye toward economics. We looked at the “outflow” of dentists, which is influenced by dentists retiring or leaving the state – and the “inflow,” which are new dentists entering the field, primarily from Pennsylvania’s dental schools. Using this perspective, we found that rural communities are likely to be further impacted by expected trends in the dentist workforce. Analysis shows that as many as 30-40 percent of the dentists will leave the profession by 2040. In terms of inflows, approximately 350-360 graduates from the three dental schools based in Pennsylvania enter the workforce each year.⁸⁸ We found that 70 percent of dentists active in Pennsylvania in 2019 had graduated from either Temple, Penn, or Pitt. Most troubling with this imbalance is that rural communities are likely to be further underserved because new dentists are not locating to rural areas to begin their practice. Instead, dental graduates are preferring more readily available employment options in non-rural areas of the state. We found that in 2019, only six percent of the graduates from Pennsylvania-based dental schools practiced in rural areas.

There is little research available to explain why this trend is occurring. Anecdotally, experts informed us that the prevalence of Dental Service Organizations (DSOs), which own or contract with oral healthcare practices to manage the business and non-clinical operations, has changed the nature of dental work. DSOs offer many advantages to dentists in terms of compensation, quality of work life, and practice growth. Further, patients also benefit from DSOs and their ability to lower costs through economies of scale, which can lower out of pocket costs for patients. However, DSOs are more likely to be found where population densities and average incomes are higher. These are not typically found in rural communities. In fact, we found that less than two percent of all DSO-affiliated full time equivalent (FTE) dentists practiced in rural areas.

⁸⁸ See <https://www.ada.org/resources/research/health-policy-institute/dental-education>, accessed August 22, 2022.

Cost is one of the most significant barriers to accessing dental services across the country.

Cost of dental services is also a significant barrier to access to dental care in rural communities. Cost is not measured simply by fee for services but is influenced by other factors such as the geographic distribution of dentists and population to provider ratios. Stated simply, more dentists in an area equals a lower population to provider ratio, which helps to lower cost. No solid criteria exist as to what the ideal population to provider ratio should be, but our research indicated that 5,000:1 to 4,000:1 is considered to be adequate.⁸⁹ Pennsylvania is fortunate to only have 12 counties exceed these ratios, but nine of the counties are rural, which may limit their communities' ability to obtain lower cost services. Additional burdens such as travel time and lack of support resources (e.g., public transit, access to childcare) impact rural communities. Other influences such as inflation, which have seen historic increases specifically in the oral healthcare sector, are impacting access to services, especially in rural communities.

Another barrier to dental care access presents itself for low-income patients that rely upon publicly funded insurance programs, like Medicaid. While many dentists accept Medicaid as a form of payment, we were informed that there is a distinction between accepting Medicaid and being a "meaningful provider," which is defined as billing \$10,000 or more to Medicaid. Using this lens, rural communities are disadvantaged as there are many more (36 percent) meaningful providers in non-rural communities than rural communities, which again makes access an issue for rural residents. Our analysis also showed that there are obvious reasons why dental providers may be reluctant to expand their Medicaid billing. Compared to private insurance, reimbursement rates are less. Thus, from a financial solvency standpoint many providers are reluctant to take on new Medicaid patients, which is a trend that disproportionately affects recipients in rural counties, where the short supply of dentists is already an issue.

Finally, we looked at emergency care access for dental-related issues in rural areas of the state. We hypothesized that these visits were increasing for rural residents given the lack of access to dentists. However, using emergency room hospital admission data, which we obtained from the Pennsylvania Health Care Cost Containment Council (PHC4), we found that during the period 2018-2021 admissions had declined by seven percent, while non-rural areas' admissions had increased by eight percent. Upon further investigation of the data and reviewing the results with experts, there are some possible explanations for this trend. In particular, the results may have been influenced by the relative age of the patients, the decline of rural hospitals, and the increasing utilization of urgent care clinics.

⁸⁹ As noted in Section II, HRSA sets the population-to-provider ratio for Dental Health Provider Shortage Areas (DHSPA) at 5,000:1, or 4,000:1 for areas of high need.

A. Access to Dentists

In Section III, we provided background on the educational and licensure requirements for dentists practicing in Pennsylvania, which are the central figures in the oral healthcare industry. In addition, we also highlighted the role these providers have in supervising other professions within oral healthcare. For these reasons, dentists are critically important to improving access to care for rural communities. In this issue area, we explore several key topics within the dentist labor force, and the impacts these trends have on rural communities. Much of the analysis for this discussion was garnered from a recent report published by the PCOH and the ADA regarding the dental healthcare workforce in Pennsylvania.⁹⁰

Dentist “Supply”

We previously documented that the current number of dentists in non-rural areas exceeds that of rural portions of the commonwealth at a rate of 15:1. However, to fully understand this issue it is also important to look at these numbers over time. As such, we explored the potential “supply” of dentists coming into the workforce, which is impacted by “in-flows” (i.e., new dentists coming into the market) and “outflows” (i.e., dentists leaving the workforce).

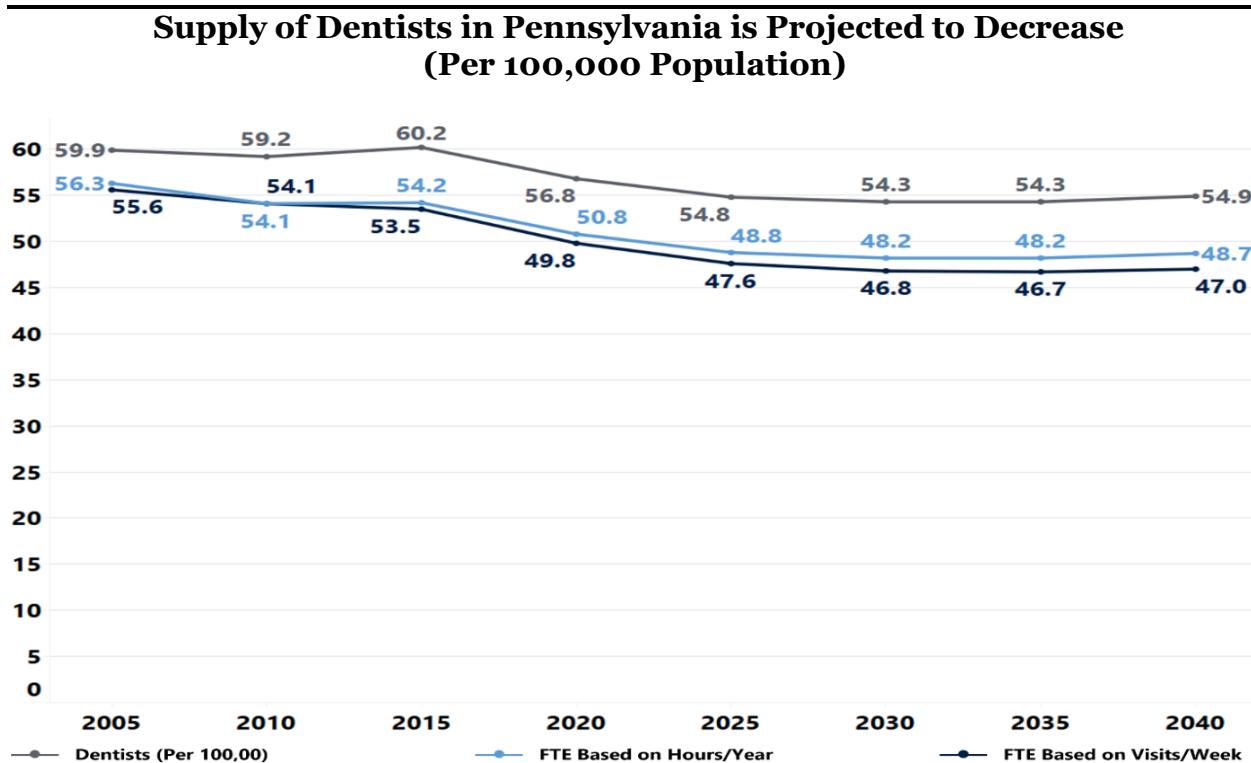
Our analysis is based on previous work from the PCOH and the ADA, which used historical demographic data on dentists from the ADA Masterfile. PCOH/ADA compared historic data pertaining to the oral healthcare labor force and national business cycle trends (market expansions and contractions) to chart the supply of dentists in Pennsylvania’s workforce since 2005. The organizations then used this economic modeling to project three trends as follow:

1. The number of dentists in Pennsylvania through 2040.
2. The projected supply of dentists based on the number of hours worked.
3. The number of patients seen by the average provider in a typical week.

We used this data to plot a trend analysis for each of these respective areas, as shown in Exhibit 12.

⁹⁰ ADA and PCOH, *Access to Dental Care in Pennsylvania*, 2021.

Exhibit 12



Source: Developed by LBFC staff from information provided by PCOH and the ADA.

According to PCOH/ADA, the supply of dentists per 100,000 residents has been steadily declining for the last seven years, and that trend is expected to continue for the next decade.⁹¹ From its peak at 60.2 dentists per 100,000 residents in 2015, the total supply of providers in the workforce (**grey** line) decreased by six percent to 56.8 per 100,000 residents in 2020. Further, continued declines are projected until the supply of dentists per 100,000 residents bottoms out at 54.3 between 2030 and 2035. Even after a slight increase in the projected number of dentists in the workforce, by 2040 the number of providers in the commonwealth is expected to be almost 10 percent less than it was at the peak in 2015.

Further adding to this issue is the matter of FTE workload. Although the year-to-year trends within each ratio remain largely the same, considering the workload of typical dentists significantly reduces the supply of providers in the workforce. After adjusting for hours worked (**light blue** line) and patients seen (**navy** line), the number of dentists per 100,000 residents is reduced from the overall headcount by an average of 11 percent and 13 percent, respectively.

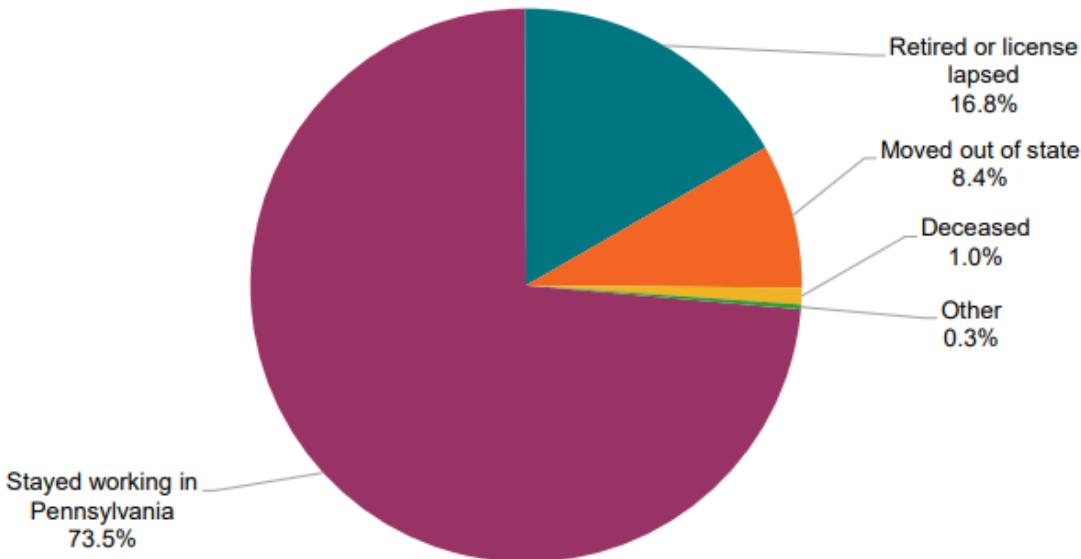
⁹¹ This corresponds with our own analysis in Section III, which found a three percent decline in the number of dentists in Pennsylvania per 100,000 residents between 2018 and 2020.

Outflows from the Dental Workforce

To understand why the supply of dentists in the commonwealth is expected to decline, we need to first provide context about the outflows or the reasons why dentists are leaving the profession. For this analysis, the PCOH/ADA reviewed the change in professional status of the commonwealth's dentists between 2015 and 2020. A summary of this analysis is shown in Exhibit 13.

Exhibit 13

Pennsylvania Lost Over a Quarter of its Dentists Between 2015 and 2020



Source: PCOH/ADA, *Access to Dental Care in Pennsylvania*, 2021.

Pennsylvania lost over a quarter of its dentists between 2015 and 2020. The commonwealth's dentists most commonly exited the labor market due to retirement or a lapsed license (17 percent), or because they moved out of the state (eight percent).

While this historical trend is informative in terms of understanding current barriers to access to oral healthcare, perhaps more illuminating is how the departure of dentists from the workforce may be intensified in the future. In this regard, PCOH/ADA projected that the outflow of dentist will likely grow to between 30-40 percent through 2040.

Dentists Retiring from the Workforce. The most common reason why dentists have left the workforce in Pennsylvania since 2015 is retirement. Although there are many professional and personal

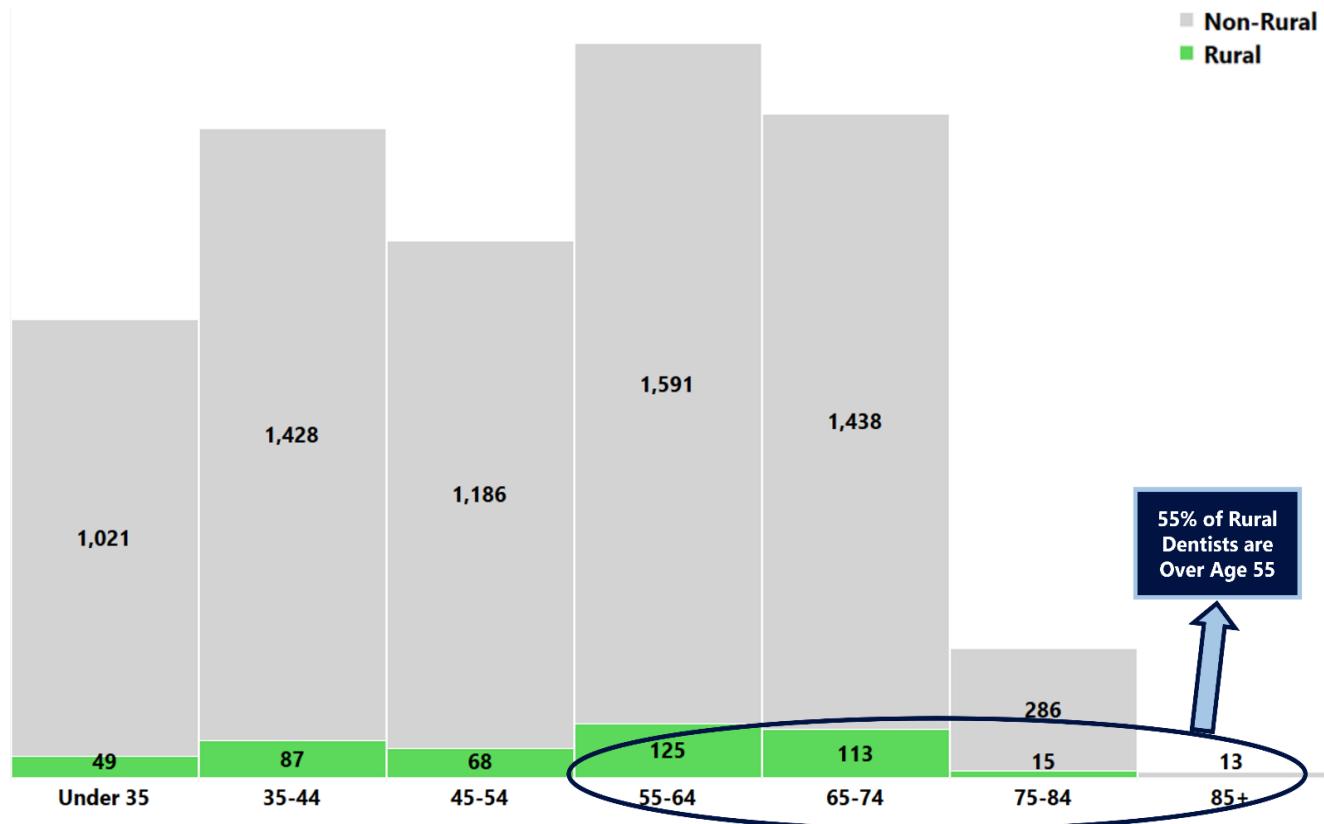
factors that are involved in the decision to retire, perhaps the most quantifiable factor is age.

Knowing that rural areas of the state tend to have older populations, it stands to reason that the dentists serving these areas are also older. Consequently, as these rural dentists reach retirement age, the rural communities may face additional access to care barriers simply because younger dentists are not “backfilling” the positions as quickly.

To further investigate this likelihood, we used the ADA Masterfile to determine the age of each Pennsylvania-based dentist and then further isolated the data by whether they were a rural or non-rural practicing dentist. Our results are shown in Exhibit 14.

Exhibit 14

Over Half of Dentists in Rural Counties Were Over the Age of 55 in 2022



Source: Developed by LBFC staff from information provided by the ADA.

Our analysis found that in 2022, 55 percent of dentists practicing in rural counties are over the age of 55. By comparison, only 48 percent of dentists in non-rural counties are aged 55 or older. As such, this age-related

gap between rural and non-rural dentists could be a concern as older dentists – which are the largest proportion of rural dentists – will likely retire.

In support of this theory, recently published research from the ADA found that in 2020 the average retirement age for dentists nationwide was 68.⁹² To this point, in rural counties, there are currently more dentists at or approaching that average retirement age (52 percent of dentists between ages of 55 and 74) than there are in all other age groups combined. As will be discussed in the discussion on “inflows” later, this is likely due, in part, to the higher volume of recently graduated dentists that settle in non-rural areas as opposed to rural portions of Pennsylvania.

Dentists Migrating from Pennsylvania. The second most common cause for dentists exiting Pennsylvania is because they leave the state. Ideally, because Pennsylvania is fortunate to have several quality dental schools, there should be more dentists coming to the state than are leaving, but this does not appear to be the case.

The ADA reported that Pennsylvania was one of 23 states that experienced a net loss in the number of dentists migrating to and from the commonwealth between 2015 and 2020. With a net loss of two and a half percent, Pennsylvania had the 11th highest departure rate of those 23 states. Further, the commonwealth had the fourth highest departure rate (eight percent) among the 29 states that experienced net losses of dentists under the age of 40.⁹³

To explore this issue further, we took the raw data from the ADA’s analysis to examine which states dentists are migrating to after leaving Pennsylvania. Our results are presented in Exhibit 15.

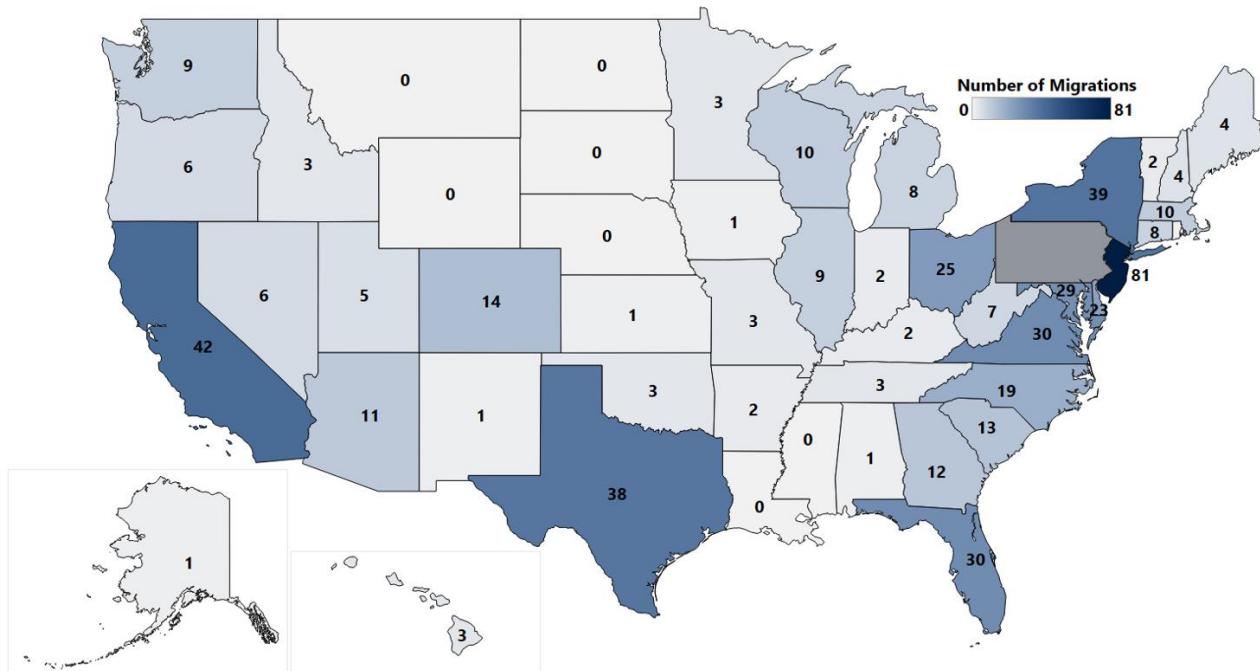
Pennsylvania was one of 23 states that experienced a net loss in the number of dentists migrating to and from the commonwealth between 2015 and 2020.

⁹² ADA, *The Dentist Workforce – Key Facts*, 2021.

⁹³ ADA, *Dentist Migration Across State Lines*, 2021.

Exhibit 15

Almost 40 Percent of Pennsylvania's Migrating Dentists Have Moved to Bordering States



Source: Developed by LBFC staff from information provided by the ADA.

Our analysis found that approximately 40 percent of dentists migrating from Pennsylvania since 2015 have moved to the bordering states of New Jersey, New York, Maryland, Ohio, Delaware, and West Virginia. Other common destinations include states such as California, Texas, Virginia, and Florida, which mirror the migration trends of the general population.⁹⁴

These migrations are mostly due to the departure of younger dentists. Dentists under the age of 40 accounted for 73 percent of all the provider migrations out of the commonwealth between 2015 and 2020. In addition, this age group was responsible for 68 percent of the migration to the neighboring states discussed above.

Impact on Rural Pennsylvania. Any fluctuation in the supply of dentists in the commonwealth will have a significantly larger impact on rural areas than it does non-rural areas. While we do not have data to examine from which portions of the state dentists are leaving, we

⁹⁴ See <https://www.census.gov/library/stories/2022/03/net-domestic-migration-increased-in-united-states-counties-2021.html>, accessed November 10, 2022.

can generally speak to the effect that the outflow of providers can have on rural communities.

For example, earlier analysis projected the outflow of dentists from the commonwealth based on a variety of business cycle models. The outflow rates used by PCOH/ADA consider providers who have retired, allowed their license to lapse, have moved out of the state, or have passed away before retirement. To quantify the potential impact of providers leaving Pennsylvania's workforce, we took the supply of dentists from the ADA Masterfile, and determined the number of currently practicing dentists that would be removed from the workforce following "average" outflow rates between 2020 and 2025. The results of this analysis are shown in Exhibit 16.

Exhibit 16

Rural Pennsylvania Could Lose Approximately 100 Dentists by 2025 Under "Average" Business Cycle Outflow Rates

Age Group	Number of FTE Dentists (2019 ADA Masterfile)		"Average" Business Cycle Outflow Projection 2020-2025 (%)	Number of FTE Dentists Lost	
	Non-Rural	Rural		Non-Rural	Rural
Under 35	1,021	49	30.87	315	15
35-44	1,428	87	10.93	156	9
45-54	1,186	68	7.34	87	5
55-64	1,591	125	15.49	246	19
65-74	1,438	113	42.67	614	48
75-84	286	15	69.10	198	10
85+	13	0	89.59	12	0
Total	6,964	456	NA	1,628	107

Source: Developed by LBFC staff from information provided by the ADA.

Our analysis found that rural Pennsylvania counties could lose approximately 100 dentists by 2025 under average business cycle outflow assumptions. Although non-rural areas would also be projected to lose a large quantity of its dentists, it must be noted that there is already a gap between providers in rural and non-rural counties. For example, as stated in Section III, we found that the number of dentists in non-rural areas outpaces that of rural areas at a rate of 15:1.

The Center for Rural Pennsylvania anticipates that the commonwealth's population is expected to increase through 2040. Population growth in

non-rural counties is expected to outpace that of rural areas considerably, but the concern becomes the ability of both communities to increase their supply of dentists to scale.⁹⁵

When considering the inflow of new dentists to backfill outgoing dentists is insufficient, undoubtedly this condition will worsen for rural populations seeking access to oral healthcare. Further, as discussed in detail below, newly incoming dentists are much more likely to settle in non-rural areas of the state. This means that, not only will rural areas be unable to replace its outgoing dentists, but the number of dentists in these areas will not be able to keep pace with the expected population growth.

Inflows from the Dental Workforce

Equally important to the flow of dentists out of Pennsylvania is the flow of new dentists into the state. Inflows of dentists to the state come primarily from recent graduates of dental school. In the discussion that follows, we highlight from where these dentists originated, where in the state new providers are settling, and the challenges associated with establishing new dental practices in rural communities.

Inflow of Dentists from Pennsylvania Dental Schools. Approximately 90 percent of new dentists entering the workforce in the United States are recent dental school graduates, of which there were over 6,000 in 2019.⁹⁶ A recent study from PCOH estimates that dental schools based in Pennsylvania graduate approximately 360 of these dentists into the workforce each year.⁹⁷ As noted in Section II, three of the country's 70 accredited dental schools – Temple, Penn, and Pitt – are in Pennsylvania.⁹⁸ Currently, California (six), New York (five), and Texas (four) are the only states that have more dental schools than the commonwealth.⁹⁹ In addition, the Lake Erie College of Osteopathic Medicine (LECOM) maintains a clinic location in Erie for fourth year students from its dental school in Florida.

For the purposes of this study, we wanted to analyze the distribution of dentists with degrees from the commonwealth's dental schools across rural and non-rural areas of Pennsylvania. To accomplish this task, we used our extract of the ADA Masterfile, which included the education background of the dentists in Pennsylvania in 2019. The results of this review are presented in Exhibit 17.

⁹⁵ According to the Center for Rural Pennsylvania, the population of non-rural areas is expected to increase by 14 percent by 2040, whereas rural counties are only expected to see a four percent increase. See Center for Rural Pennsylvania, *Looking Ahead: Pennsylvania Population Projections 2010 to 2040*, 2014.

⁹⁶ ADA and PCOH, *Access to Dental Care in Pennsylvania*, 2021.

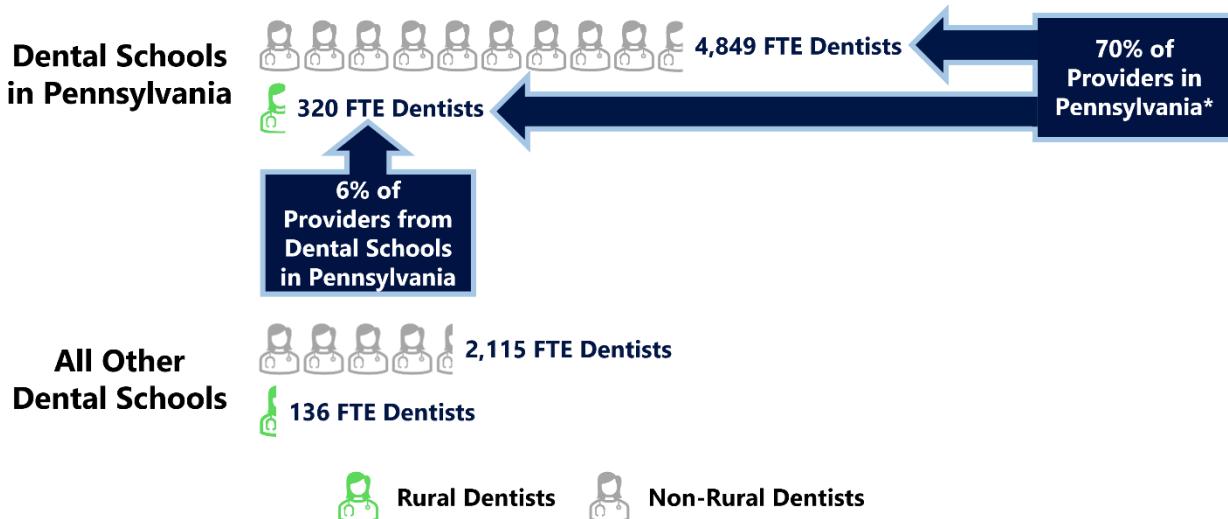
⁹⁷ PCOH, *Access to Oral Health Workforce Report Part I*, 2022.

⁹⁸ See <https://www.ada.org/resources/research/health-policy-institute/dental-education>., accessed August 22, 2022.

⁹⁹ Illinois, Florida, and Massachusetts also all have three dental schools within their respective states.

Exhibit 17

Only Six Percent of Providers from Pennsylvania-based Dental Schools Practiced in Rural Areas of the State in 2019



Notes:

*/ There was one provider who graduated from a dental school in Pennsylvania and did not provide practice location information.

Source: Developed by LBFC staff from information provided by the ADA.

Most dentists practicing in the commonwealth graduated from one of Pennsylvania's three dental schools, which is a positive outcome. We found 70 percent of providers attended either Temple, Pitt, or Penn.¹⁰⁰ However, what is a troubling trend for access to oral health care in rural communities is that the overwhelming majority of graduates from Pennsylvania's dental schools are practicing in non-rural portions of the state. Combined, only six percent of providers that graduated from the commonwealth's three dental schools had practices in rural counties as of 2019.¹⁰¹

Through our discussions with stakeholders – including the deans from two of Pennsylvania-based dental schools – we have developed several

¹⁰⁰ It is important to emphasize that this figure only considers the three dental schools primarily based in Pennsylvania. However, this statistic does not change significantly when factoring in the 34 dentists in Pennsylvania in 2019 that graduated from LECOM (5,170 providers that graduated from Temple, Pitt, and Penn versus 5,204 that graduated from Temple, Pitt, Penn, and LECOM).

¹⁰¹ Pitt had the largest proportion of its alumni practicing in rural areas at 10 percent, followed by Temple with five percent and Penn with three percent. This distribution does not change when LECOM is factored into the provider count.

possible explanations for the trends seen above. First, these experts indicated that in their experience, living in a non-rural area (e.g., major city) is more appealing to a younger generation of dental school graduates. While this explanation is purely anecdotal, it should be noted that an emphasis towards urbanization does match historical general population migration patterns in the United States.¹⁰² While recent studies indicate that this trend may have been offset in the last several years as result of the Covid-19 pandemic, the degree to which pandemic related migration patterns have impacted the distribution of dentists between rural and non-rural areas has not been fully explored.^{103,104}

Second, practicing in a non-rural area may be more financially viable for recent dental school graduates. Based on publicly available information for the 2022-2023 academic year, we calculated the total in-state tuition costs for a four-year degree-awarding dental program to be \$212,000 for Pitt,¹⁰⁵ \$261,000 for Temple,¹⁰⁶ and \$332,000 for Penn.¹⁰⁷ These figures do not include housing, dining, health care, technology, and clinical fees, among others, that are required of the programs, which we estimate to be at least an additional \$100,000 over the four year period.¹⁰⁸ Not surprisingly, the American Dental Education Association (ADEA) reported that the average educational debt for dental school graduates in 2021 was over \$301,000.^{109,110}

The average educational debt for dental school graduates in 2021 was over \$301,000.

With these costs considered, it is highly unlikely for new dentists to have the available capital immediately following graduation (or shortly thereafter) to start their own practices, especially in rural areas where the necessary infrastructure may not be readily available. This means that recent graduates are much more likely to look for opportunities among existing practices following graduation. To this point, dental practices (and therefore opportunities for recent graduates) are in much more abundance in non-rural areas of the state. This cycle then repeats itself with each graduating class, further adding to the disparity of providers among rural and non-rural areas.

¹⁰² See <https://www.ers.usda.gov/topics/rural-economy-population/population-migration/>, accessed November 11, 2022.

¹⁰³ See <https://www.brookings.edu/blog/the-avenue/2022/04/14/new-census-data-shows-a-huge-spike-in-movement-out-of-big-metro-areas-during-the-pandemic/>, accessed November 11, 2022.

¹⁰⁴ Johnson, *Population Redistribution Trends in Nonmetropolitan America, 2010 to 2021*, 2022.

¹⁰⁵ Calculated on \$52,918 annual tuition for in-state students. See <https://www.dental.pitt.edu/education/doctor-dental-medicine/financing-your-dmd-education/dmd-budgets>, accessed November 11, 2022.

¹⁰⁶ Calculated on \$65,192 annual tuition for in-state students. See https://bursar.temple.edu/sites/bursar.temple.edu/files/documents/Tuition_Rates.pdf, accessed November 11, 2022.

¹⁰⁷ Calculated on \$83,122 annual tuition for all students. See <https://srfs.upenn.edu/costs-budgeting/dental>, accessed November 11, 2022.

¹⁰⁸ Temple did not have fee information on its DMD program publicly available. We calculated total fees to be \$141,000 and \$167,000 for Penn and Pitt, respectively, for their four-year DMD programs.

¹⁰⁹ See https://www.adea.org/godental/money_matters/educational_debt.aspx, accessed November 11, 2022.

¹¹⁰ This aligns with similar findings from the ADA, who reported that the average debt for dental school graduates was \$304,000 in 2020.

Finally, we were informed that there is a waning desire for new dentists to start their own practices. Instead, there is a growing number of dental students that are choosing to join Dental Service Organizations (DSOs – also called Dental Support Organizations). Despite being a relatively recent development in the oral healthcare industry, DSOs are proving to have an increased impact on the workforce trends of younger dentists. As such, we will discuss the emergence of DSOs and the impact these entities have on rural Pennsylvania in the next issue area.

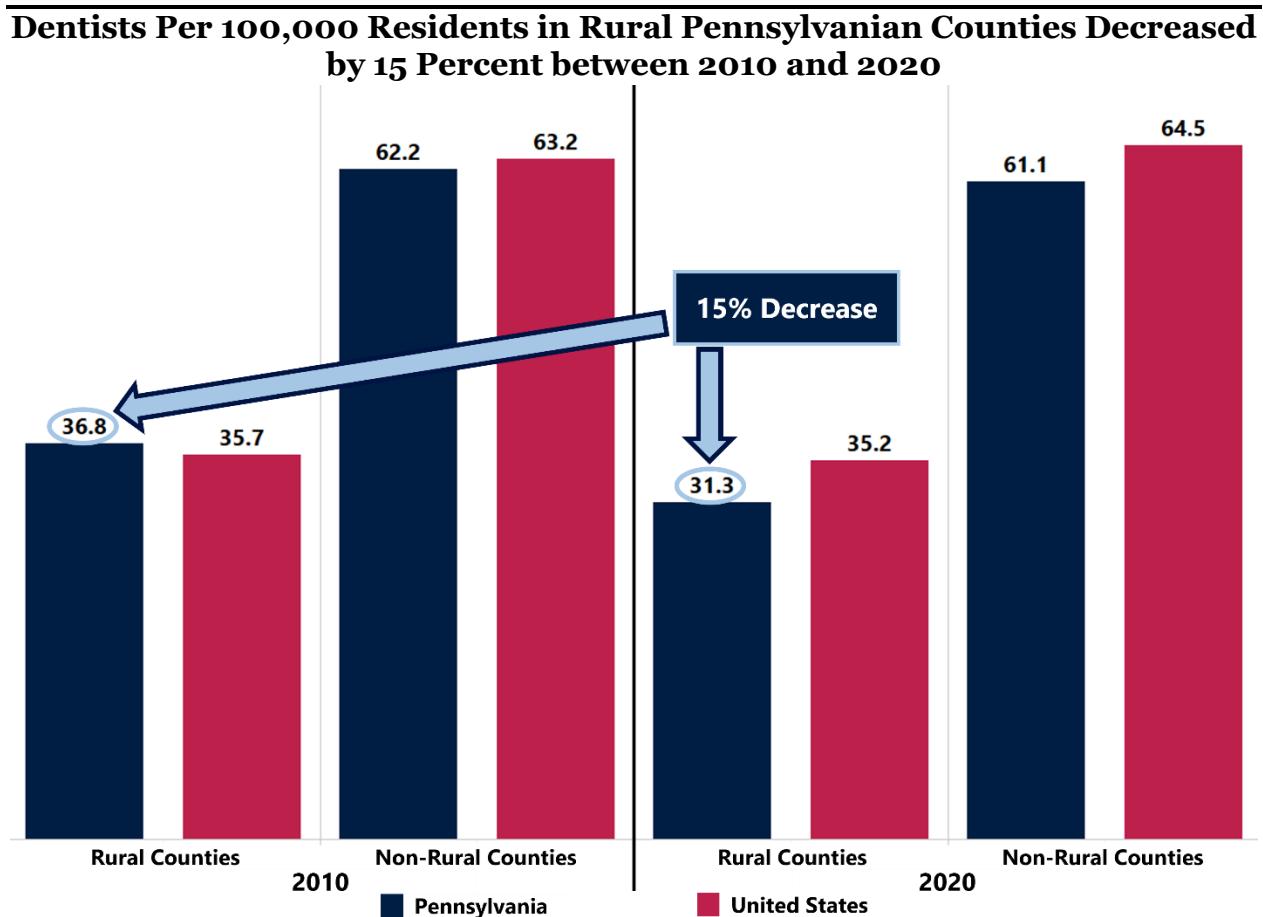
Change in the Dentist Workforce in Rural Communities

The trends discussed in this issue area are likely to create a disproportionate impact on rural communities across Pennsylvania. The entire state has experienced a net loss in terms of migrating dentists, but rural areas must also address the fact that a significant proportion of its provider population is at or near retirement age. Although the state does have three dental schools to replace the outflow of dentists, these new dentists are slow to move into rural areas.

We have likely already seen the conditions described above have a measurable effect on rural Pennsylvania. As part of their analysis, PCOH/ADA explored the change in the number of dentists per 100,000 residents between 2010 and 2020. As shown in Exhibit 18 below, a decade ago, the number of dentists per 100,000 residents in the rural counties of Pennsylvania was 36.8, which was slightly above the national average for rural areas (35.7).

However, since then, the number of dentists in rural Pennsylvania has decreased by 15 percent, which is much faster than the rate of decline for rural counties nationally (one percent). As of 2020, the number of dentists per 100,000 residents in rural Pennsylvania counties was 31.3, which was significantly lower than the national average for counties of the same designation. Meanwhile, non-rural counties were able to remain fairly consistent in the number of dentists as part of the population, only declining by two percent in that time. As the trends discussed in this issue area continue to play out in the years to come, it is expected that the disparity in providers between rural and non-rural portions of the commonwealth will only continue to increase.

Exhibit 18



Source: Developed by LBFC staff from information provided by the ADA.

B. Dental Service Organizations (DSOs)

DSOs are groups that own or contract with oral healthcare practices to manage the business and non-clinical operations.¹¹¹ While there are examples of provider-owned DSOs, the better known examples are commonly referred to as “corporate dentistry,” where private equity firms own and operate practices across the country.^{112,113} Although not new to the oral healthcare system, DSOs offer many advantages for both practicing dentists and their patients. For the dentist, DSOs can relieve many of

¹¹¹ See <https://www.theadso.org/about-dsos/#top>, accessed November 14, 2022.

¹¹² See <https://www.agd.org/about-agd/publications-news/newsroom/newsroom-list/2020/09/14/to-dso-or-not-to-dso>, accessed November 14, 2022.

¹¹³ Two better known examples of DSOs are Heartland Dental and Aspen Dental. See <https://www.dentistryiq.com/practice-management/dsos-and-corporate-dentistry/article/14189218/what-are-the-largest-dsos-in-the-us-in-2020>, accessed November 14, 2022.

the burdensome billing/administrative aspects that are involved in running a successful practice. For the patient, because DSOs are able to leverage economies of scale and offer more flexible payment terms for services rendered, there may be lower out of pocket costs for oral health care services.

DSO Impact to Rural Communities

During our interviews with stakeholders, we were informed that there is an increasing desire among recent dental school graduates to enter the workforce as an employee of a DSO, as opposed to a member of a private practice. As a result, given that rural communities already face obstacles in attracting new dentists, the popularity of DSOs with graduates is likely to offer additional constraints in attracting new dentists to rural areas.

Although much of this evidence we heard is anecdotal and not applicable to every dental school graduate, the appeal of DSOs to new graduates is reasonable. First, with the level of student debt among dental school graduates continuing to rise, DSOs offer steady salaries and benefits packages that often are not patient-dependent (i.e., based on the number of patients seen). Second, many DSOs can also provide practice location flexibility and continuing education opportunities that cannot be offered to dentists elsewhere. Finally, from a clinical perspective, DSOs typically have the most cutting-edge dental technology, and can allow young dentists to focus on patient care rather than the administrative burden of operating a business.^{114,115}

In terms of access to oral healthcare services, the growth of the DSO model has presented challenges for rural communities. In discussing the location of a DSO, stakeholders informed us that DSOs typically prioritize market value when determining practice locations. Therefore, DSOs target areas where there is a greater likelihood of profitability, especially areas with larger clientele bases and higher levels of average income. As we documented previously, rural areas are at a disadvantage in both these areas.

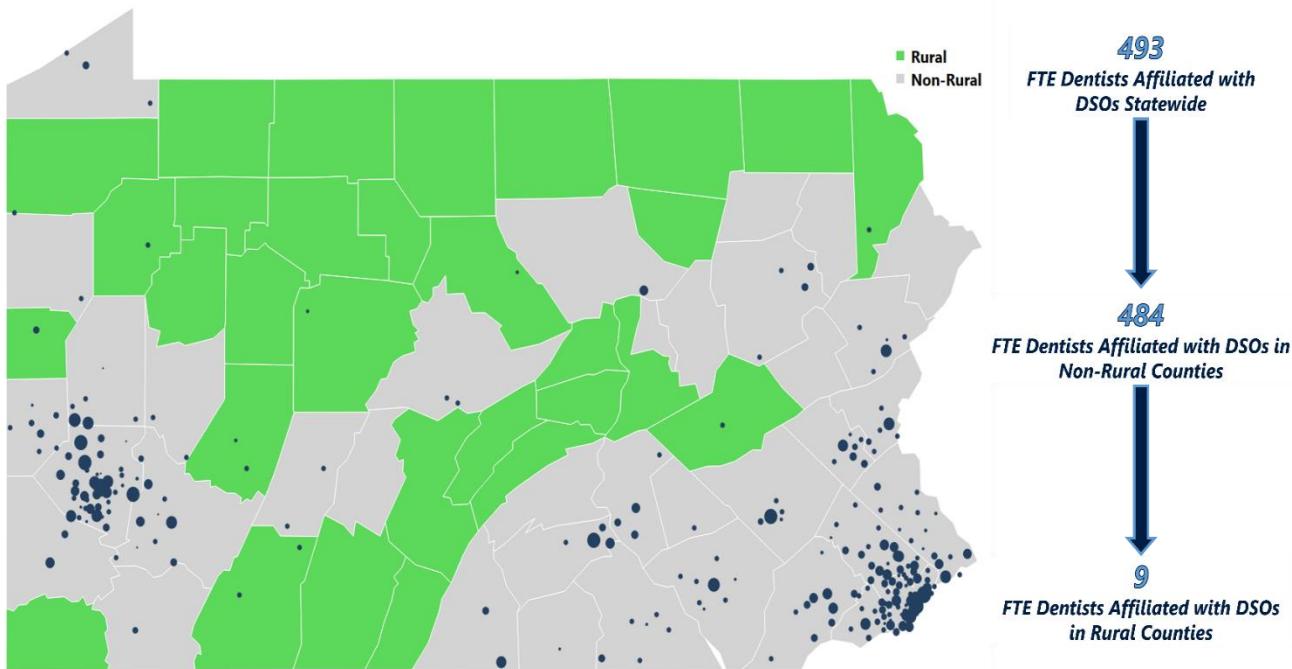
To further quantify this issue, we geographically mapped the location of dentists across Pennsylvania that indicated in the 2019 ADA Masterfile that they were affiliated with a DSO. As shown in Exhibit 19, we found that DSO affiliation among FTE dentists is overwhelmingly a non-rural occurrence.

¹¹⁴ See <https://www.agd.org/about-agd/publications-news/newsroom/newsroom-list/2020/09/14/to-dso-or-not-to-dso>, accessed November 14, 2022.

¹¹⁵ See <https://www.ada.org/publications/ada-news/2022/march/main-types-of-dsos>, accessed November 14, 2022.

Exhibit 19

Only Nine FTE Dentists from Rural Areas were Affiliated with DSOs in 2019



Source: Developed by LBFC staff from information provided by the ADA.

The ADA and other groups estimate that approximately 10 percent of dentists in the United States were affiliated with a DSO in 2020, although this number is likely to be undercounted.¹¹⁶ Our analysis showed that Pennsylvania was slightly behind the national trend, with seven percent of dentists reporting DSO affiliation in 2019. However, within this subset of nearly 500 dentists, we found that DSO affiliation was almost exclusively a non-rural area phenomenon. Only nine FTE-equivalent dentists – less than two percent of all DSO-affiliated providers – were found to be in rural areas. These nine providers were spread across eight of the state's 30 rural counties.¹¹⁷

¹¹⁶ See <https://www.agd.org/about-agd/publications-news/newsroom/newsroom-list/2020/09/14/to-dso-or-not-to-dso>, accessed November 14, 2022.

¹¹⁷ These counties were Clearfield, Clinton, Indiana, Lawrence, Schuylkill, Somerset, Venango, and Wayne.

Stakeholder groups also reported that DSO affiliation is linked with age, as nearly 20 percent of dentists under the age of 35 nationally are employed by a DSO. Our analysis showed that approximately eight percent of all dentists under the age of 35 in Pennsylvania were affiliated with a DSO in 2019.¹¹⁸ However, we did find – across both rural and non-rural areas – that the average age of dentists affiliated with DSOs was younger than that of their private practice counterparts.¹¹⁹

Although a relatively small portion of overall providers, we believe that DSOs will play an important role in the commonwealth's oral healthcare industry moving forward. Stakeholders have noted that DSO involvement has been steadily increasing year-over-year.¹²⁰ One dean from a commonwealth dental school told us that roughly half of all new dentists nationwide are now choosing to work for a DSO following graduation. Further, prior to the COVID pandemic, the ADA was tracking a trend of older dentists increasingly selling their private practices to DSOs in the years before or upon retirement.¹²¹ While there is limited data currently available, it is likely that this trend was only accelerated in the years following the pandemic, helping to hasten the decline in private practice ownership that has been occurring in oral healthcare over the last two decades.¹²² As a result, while DSOs offer many strategic advantages for both dentists and patients, residents living in rural communities may not have easy access to these facilities, which offers another obstacle to obtaining oral health care services.

Cost for dental care is not measured simply by fee for services but is influenced by other factors such as the geographic distribution of dentists and population to provider ratios.

C. Influences on Dental Care Cost

In this issue area, we explore perhaps the largest barrier to obtaining dental care in rural areas – cost. First, we review how the distribution of dentists in relation to the commonwealth's population can dictate costs. Then, we discuss why dental costs prove to be a significant barrier to populations in rural communities. We conclude by highlighting how the current economic climate has impacted the cost of dental services in recent years.

¹¹⁸ We did find that nearly 20 percent of the dentists affiliated with a DSO were under the age of 35, however.

¹¹⁹ In rural areas, the average age of dentists affiliated with DSOs was 51, compared to an average age of 55 among dentists in private practice. In non-rural areas, the gap was 47 and 54, respectively. Across the state, the average age of dentists affiliated with a DSO was 48, compared to an average age of 53 for all other dentists.

¹²⁰ Ibid.

¹²¹ Some of the leading causes behind such decisions were a desire for increased patient interaction and less administrative burden prior to retirement. Additionally, many dentists feel there is less financial risk in the DSO model as opposed to selling a private practice upon retirement. See <https://www.ada.org/publications/ada-news/2022/march/main-types-of-dsos>, accessed November 14, 2022.

¹²² ADA, *Practice Ownership Among Dentists Continues to Decline*, 2021.

Geographic Access to Care and Provider Shortage Areas

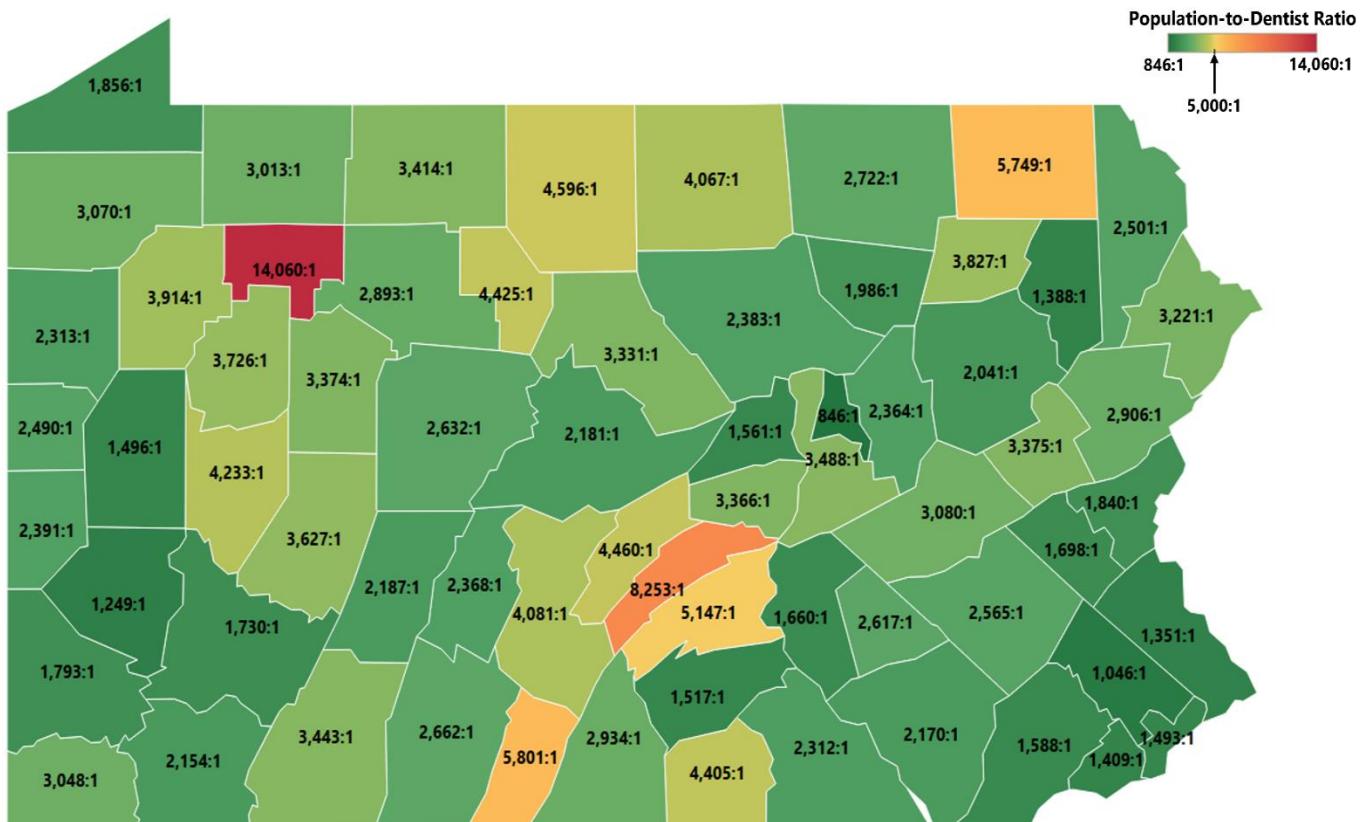
Before discussing cost as a barrier to dental healthcare for rural populations, it is necessary to frame the discussion within the context of the distribution of dentists in Pennsylvania. This context is an important distinction because rural areas of the state can be disproportionately impacted simply because there are often fewer dentists. For example, if there is only one dentist serving a population base, then those patients do not have an opportunity to seek lower cost care from another provider, without incurring additional travel cost. To this point, organizations such as the Health Resources and Services Administration (HRSA) and the ADA use population-to-provider ratios when analyzing areas of potential need.

To better understand this condition, using data from the ADA Masterfile we aggregated the number of dentists by county based on practice location and compared these values to population data obtained from the United States Census Bureau for the same year (2019). We then translated this calculation into population-to-provider ratios for each county.

Additionally, as noted in Section II, HRSA sets the population-to-provider ratio for Dental Health Provider Shortage Areas (DHSPA) at 5,000:1, or 4,000:1 for areas of high need. Using these criteria, we deemed any ratio below 5,000:1 as “adequate,” but took note of counties that would not meet the 4,000:1 threshold. To illustrate these distinctions, we then used a graduated shading scale to highlight each county’s population-to-provider ratio. We marked the 5000:1 threshold in **tan**. Counties that were adequate (i.e., within the “acceptable” ratio) are shown in varying shades of **green** (e.g., darker green indicating a better ratio). The greatest population to provider ratio is in **red**. The results are shown in Exhibit 20.

Exhibit 20

Only 4 Counties Exceeded a Population-to-Provider Ratio of 5,000:1 in 2019*



Notes:

*There was one dentist in the ADA Masterfile that did not provide a practice location or residential address.

Source: Developed by LBFC staff from information provided by the ADA and the U. S. Census Bureau.

Our analysis showed that only five counties¹²³ exceeded the standard 5,000:1 population-to-provider ratio. An additional seven counties¹²⁴ would surpass the narrower 4,000:1 threshold used for areas of high need. Of these 12 counties, 75 percent (9/12) are rural counties.¹²⁵ The average population-to-provider ratio for these nine counties was 6,166:1, which was more than twice the average for the entire state (3,028:1).

While this analysis shows a positive reflection for the commonwealth overall, it is important to highlight the disproportionate impact to rural counties. As shown in the exhibit, rural counties tend to have higher

¹²³ These counties are Forest (14,060:1), Juniata (8,253:1), Fulton (5,801:1), Susquehanna (5,749:1), and Perry (5,147:1).

¹²⁴ These counties are Potter (4,596:1), Mifflin (4,460:1), Cameron (4,425:1), Adams (4,405:1), Armstrong (4,233:1), Huntingdon (4,081:1), and Tioga (4,067:1)

¹²⁵ These counties are Cameron, Forest, Fulton, Huntingdon, Juniata, Mifflin, Potter, Susquehanna, and Tioga.

population to provider ratios than their non-rural counterparts.¹²⁶ Further, even though some rural counties may fall within the acceptable DHSPA ratios, it does not reflect the added burdens such as travel time and lack of support resources (e.g., public transit, access to childcare) that may afflict more rural counties.¹²⁷ As we will discuss in the issue areas that follow, the overall higher population-to-dentist ratios magnifies many of the costs and barriers for rural residents in need of oral healthcare.

Dental Healthcare Costs

Cost continues to be the primary barrier for dental care regardless of age, income level, or insurance status.

Several studies have found that dental care constitutes the most substantial barriers out of all types of healthcare.^{128,129} As noted above, the existence of low-income populations throughout Pennsylvania play a considerable role in many of the commonwealth's DHPSA designations. While there are many factors that inhibit access to oral healthcare in rural areas, financial barriers are perhaps the most significant. Researchers from the ADA and other stakeholder groups have found that within dental care, cost was over twice as likely to be the reason for not going to the dentist than any other cause. Cost continues to be the primary barrier for dental care regardless of age, income level, or insurance status (private, public, no insurance, etc.).¹³⁰ This holds true for Pennsylvania as well. A recent study from the ADA and the Pennsylvania Coalition for Oral Health (PCOH) found that cost was the most cited reason for not visiting the dentist among adults enrolled in the MA program.¹³¹

In order to fully contextualize why financial burdens, create a significant barrier to dental services access, we must also establish a reference point for the cost of common dental procedures. Such costs can be difficult to define at either the state or national level, as rates for services can vary widely based on location, consumer demand, and dental insurance coverage (or lack thereof). Nevertheless, we did form approximate cost

¹²⁶ The average population-to-provider ratio for rural counties was 3,961:1. The same average for non-rural counties was 2,272:1.

¹²⁷ It is also important to mention that the methodology used to classify HPSAs has been widely criticized, including by the United States Government Accountability Office (GAO), which found that HPSAs do not reflect realistic market boundaries or needs. See GAO, *Health Professional Shortage Areas Problems Remain with Primary Care Shortage Area Designation System*, 2006.

¹²⁸ ADA, *Making the Case for Dental Coverage for Adults in All State Medicaid Programs*, 2021.

¹²⁹ Vujicic, Buchmueller, and Klein, *Dental Care Presents the Highest Level of Financial Barriers Compared to Other Types of Health Care Services*, 2016.

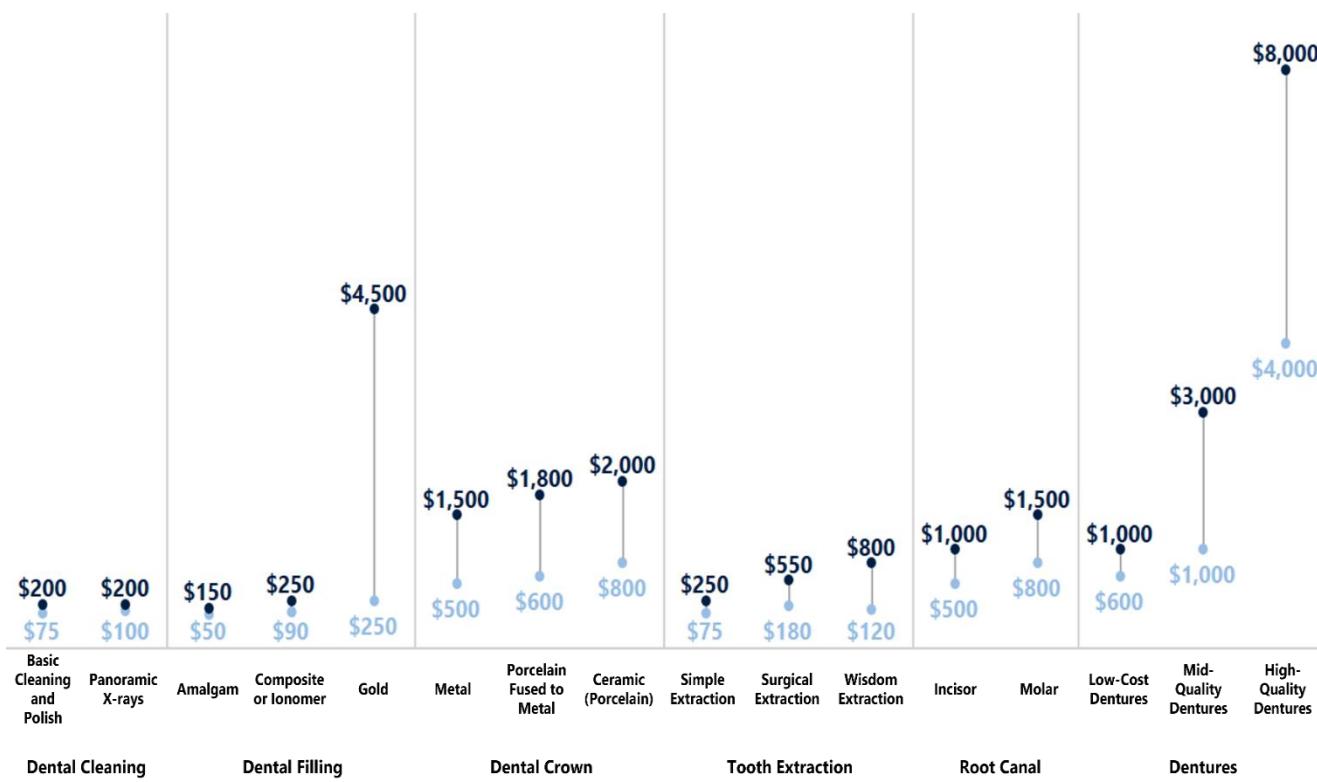
¹³⁰ Ibid.

¹³¹ ADA and PCOH, *Access to Dental Care in Pennsylvania*, 2021.

ranges for some of the most common dental procedures based on information produced by national insurance organizations.¹³² These results are shown in Exhibit 21 below.

Exhibit 21

Cost Estimates for Common Dental Services



Source: Humana.

Costs for dental services can vary greatly depending on procedure type. For example, a simple cleaning may cost a few hundred dollars, whereas more complex procedures such as root canals or denture replacements may cost thousands of dollars based on the type of service received.

For rural areas, the structure of dental insurance plans within the healthcare delivery system further complicates the issue. Historically,

¹³² Information produced by several Pennsylvanian insurance agencies fell within the ranges shown in our analysis. See <https://www.humana.com/dental-insurance/dental-resources/cost-of-dental-procedures>, accessed October 12, 2022.

dental care has been kept separate from insurance plans that cover medical diseases.¹³³ It is estimated that as many as two-thirds of the American population¹³⁴ with private dental insurance obtain these plans through their employers.¹³⁵ However, residents of rural communities are more likely to be self-employed or work for small organizations for whom the provision of company-wide dental care coverage may be difficult.¹³⁶ Rural residents, in turn, may be left to find dental insurance on their own or be left without coverage entirely.

Even with dental insurance, cost remains the primary barrier for dental services among individuals with private insurance. Researchers have cited restrictive financial provisions – such as high copayments, significant coinsurance rates, and maximum benefit limits – as drivers that force consumers with private insurance to still pay considerable out-of-pocket fees for dental services.¹³⁷

All 41 of the DHPSA-designated counties in Pennsylvania were deemed as such due to the presence of low-income populations.

By far, cost is the most substantial barrier for low-income individuals. For example, in one 2016 survey, over a quarter of individuals below 100 percent of the Federal Poverty Line reported skipping needed dental care in the previous 12 months due to cost.¹³⁸ Although states can cover dental services for low-income individuals under Medicaid, many states either only offer coverage in emergency situations, or include dollar amount or procedure limits in their coverage.¹³⁹ This issue is significant for Pennsylvania, as all 41 of the DHPSA-designated counties in the commonwealth were deemed as such due to the presence of low-income populations, that conceivably would be eligible for the MA program. This issue is discussed further in Issue Area ____.

Finally, it must be noted that for individuals that forgo oral healthcare due to financial barriers, the dental issues for which they would seek care are often not self-healing. Many times, delaying care can lead to further complications and additional dental issues, which only exacerbate the problems associated with cost and access.¹⁴⁰

¹³³ This historical distinction is believed to be caused by the divergent care models of dental and medical treatments. Medical diseases are viewed as having insurable risks that are definable and can lead to significant loss, pain, or suffering. Dental diseases, on the other hand, have historically been much less defined. See Mertz, *The Dental-Medical Divide*, 2016.

¹³⁴ It was estimated that approximately two-thirds of the American population had some form of dental insurance in 2016. See *Ibid.*

¹³⁵ See <https://dentistry.uic.edu/news-stories/the-many-costs-financial-and-well-being-of-poor-oral-health/>, accessed October 12, 2022.

¹³⁶ The National Advisory Committee on Rural Health and Human Services, *The 2004 Report to the Secretary: Rural Health and Human Services Issues*, 2004.

¹³⁷ Vujicic, Buchmueller, and Klein, *Dental Care Presents the Highest Level of Financial Barriers Compared to Other Types of Health Care Services*, 2016.

¹³⁸ *Ibid.*

¹³⁹ ADA, *Making the Case for Dental Coverage for Adults in All State Medicaid Programs*, 2021.

¹⁴⁰ Mertz, *The Dental-Medical Divide*, 2016.

Impact of the Current Economic Climate on Dental Healthcare Costs

June 2022 saw the largest increase to the cost of dental services on record.

The coronavirus pandemic, and more recently inflation, have also impacted the oral healthcare sector. For example, in June 2022, national costs for dental services rose by 1.9 percent from the month prior, which was the largest monthly increase for oral healthcare services since the United States Bureau of Labor Statistics began tracking such metrics in 1995.^{141,142} These trends will likely continue.

Rising prices are the direct result of increased overhead costs for dental providers. The ADA surveyed dentists and found that the cost of personal protective equipment has doubled – or in some cases, tripled – over the last two years. Further, workforce issues, such as maintaining competitive staff salaries, have added to dental overhead costs.¹⁴³ Overall, the ADA found that over a third of dentists nationwide reported inflation and rising overhead costs to be the most important issue currently facing their practices.¹⁴⁴ In the end, these cost increases will be passed onto patients, which only further exacerbates the problem of dental services being “out of reach” for certain population subsets.

D. Dental Coverage for Low Income Individuals

Many lower income Pennsylvanians rely on Medicaid – known in the commonwealth as the Medical Assistance (MA) program¹⁴⁵ – to provide coverage for basic healthcare needs, including dental care. As we reported in the last issue area, Pennsylvania’s low-income populations have a considerable role in many of the commonwealth’s DHPSA designations. In this issue area, we dive deeper into the issue by looking at “meaningful providers” within the context of Medicaid providers and rural communities. We also review how Pennsylvania compares to other states in terms of Medicaid reimbursement rates, and how Pennsylvania compares to covered dental services.

¹⁴¹ See BLS, *Consumer Price Index – August 2022*, 2022.

¹⁴² In the context of the full economic climate, prices were up 9.1 percent from June 2021 to June 2022. This is the largest year-over-year increase to the consumer price index since 1981. See <https://www.bls.gov/news.release/cpi.nr0.htm>, accessed October 12, 2022.

¹⁴³ According to the ADA, eight out of 10 dentists have reporting issues raising staff wages competitively in the last year. See <https://www.ada.org/publications/ada-news/2022/july/dental-services-affected-by-countrys-high-inflation>, accessed October 12, 2022.

¹⁴⁴ ADA, *Economic Outlook and Emerging Issues in Dentistry*, 2022.

¹⁴⁵ In this report, we use the term “Medicaid” to broadly refer to the public health insurance system in the United States. The term “Medical Assistance (MA)” is used to denote the Medicaid program in Pennsylvania.

“Meaningful” Dental Providers

Building on the analysis presented in the last section, we looked specifically at providers who are considered to be “meaningful providers.” A meaningful provider is one that billed \$10,000 or more to Medicaid (or Medicare) in FY 2019-20. DOH and DHS sets the threshold of \$10,000 in billable claims per year,¹⁴⁶ and this threshold has been used by other states in analyzing Medicaid dental claims.¹⁴⁷

For our analysis, we calculated the average dollar amount of claims made by the meaningful providers in both rural and non-rural areas for FY 2019-20.¹⁴⁸ The results of this analysis are presented in Exhibit 22 below. County-level calculations can be found in Appendix C.

Exhibit 22

Meaningful Providers in Non-Rural Areas Billed Medicaid 36 Percent More Per Dentist in FY 2019-20*



Note:

*/Three rural counties (Cameron, Clarion, and Forest) and one non-rural county (Perry) did not report any providers with total Medicaid claims above \$10,000 for FY 2019-20.

Source: Developed by LBFC staff from information provided by DHS.

¹⁴⁶ DOH, *Pennsylvania Oral Health Plan 2020-2030*, 2020.

¹⁴⁷ ADA, *An ADA Health Policy Institute Analysis for the North Carolina Department of Health and Human Services, Division of Health Benefits*, 2020.

¹⁴⁸ For our analysis, we calculated the total amount of claims billed for both rural and non-rural counties in Pennsylvania. To adjust for the geographic distribution of dentists in these counties, we created an FTE scale based on the number of dentists and practice locations. This FTE scale is similar to the calculation performed on the ADA Masterfile, which was discussed previously. However, in this data, we distinguished unique dentists based on a combination of provider name, provider identification number, practice location, and specialty codes.

The total sum of billable claims for meaningful providers in rural counties of Pennsylvania was \$12.7 million, compared to \$188 million for claims in non-rural counties.¹⁴⁹ When factoring in the number of FTE dentists, we found that, on average, each meaningful provider in rural counties billed approximately \$109,000 to Medicaid (or Medicare) in FY 2019-20. Meaningful providers in non-rural counties billed roughly 36 percent more than their rural counterparts, with an average of nearly \$148,000 per provider in claims for the same time.¹⁵⁰

Although the data combines Medicaid and Medicare, these findings might be explained by the fact that MA recipients in non-rural counties outnumber those in rural counties at a rate of eight to one.¹⁵¹ By extension, areas with more patients would naturally create more Medicaid claims to be billed.

There are some notable limitations with this comparison. Our claims data only included providers who billed over \$10,000 in FY 2019-20. Subsequently, any provider that billed less than this threshold was excluded from our dataset. Therefore, comparing claims data to the total number of MA recipients does not create a complete depiction of spending on dental services across the state. Similarly, we lacked access to claims data to correlate the age of the patient to the type of dental services provided, which can be a factor in the ultimate payor for the services.

Further, we also question if the annual \$10,000 benchmark is realistic criterion for determining "meaningful" dental providers. Although several states use this dollar amount as an accepted standard, we were unable to find a reason for its basis. In addition, we found research that suggests this number may be outdated, including work from the National Conference of State Legislatures (NCSL) that dates to 2001.¹⁵² Given the national rise in dental care prices discussed earlier in this section, this threshold should be reevaluated in any future analysis.

Medicaid Provider Reimbursement Rates

In our discussions with oral healthcare stakeholders, we were informed of numerous reasons why a dentist may not want to participate in the MA program, such as the professional stigma associated with serving low-income patients, a higher failed appointment (meaning not showing up to an appointment) rate among Medicaid recipients compared to the general population, and the administrative burden required to submit

¹⁴⁹ Three rural counties (Cameron, Clarion, and Forest) and one non-rural county (Perry) did not report any providers with total Medicaid claims above \$10,000 for FY 2019-20.

¹⁵⁰ DOH has stated that increasing the number of general dentists who bill over \$10,000 a year on Medicaid is a strategic priority in the 2030 Oral Health Plan. See DOH, *Pennsylvania Oral Health Plan, 2020-2030*, 2020.

¹⁵¹ In Section III, we reported that there were over 4 million MA recipients in Pennsylvania's 37 non-rural counties. This is compared to the 500,000 recipients across the 30 rural counties of the commonwealth.

¹⁵² NCSL, *Increasing Dentists' Participation in Medicaid and SCHIP*, 2001.

Medicaid claims. Yet, the most common disincentive we heard was Medicaid's reimbursement rate for services rendered.

Several stakeholders suggested to us that dental providers have some of the highest overhead costs of any practitioners in the medical industry. The ADA reported that, on average, 62 percent of all revenue for dentists goes to overhead.¹⁵³ This is primarily due to the costly equipment that is required for even the most basic of services (e.g., cleaning equipment, supplies, etc.). Adding to this issue, many younger dentists find themselves with high student debt following graduation.

Faced with these expenses, many dentists believe that they will not be able to remain financially viable if they see larger volumes of Medicaid patients. For all healthcare sectors, Medicaid reimbursement rates are established at the state level. In many cases, these rates are lower than the actual cost to perform services.¹⁵⁴ Last year, the ADA produced a state-by-state analysis that compared Medicaid reimbursement rates as a percentage of private dental insurance payouts for both child and adult services.¹⁵⁵ Excerpts from the ADA's analysis are presented in Exhibit 23.

¹⁵³ See <https://www.ada.org/publications/new-dentist-news/2022/march/ask-the-expert-practical-strategies-to-reduce-dental-practice-expenses#:~:text=Fixed%20expenses%2C%20like%20rent%2C%20insurance,4%2D7%25%20of%20production.&text=Variable%20costs%2C%20such%20as%20payroll,practice%20overhead%20averages%20around%2062%25.>, accessed October 21, 2022.

¹⁵⁴ See <https://www.aha.org/fact-sheets/2020-01-07-fact-sheet-underpayment-medicare-and-medicaid>, accessed October 21, 2022.

¹⁵⁵ ADA, *Reimbursement Rates for Child and Adult Dental Services in Medicaid by State*, 2021.

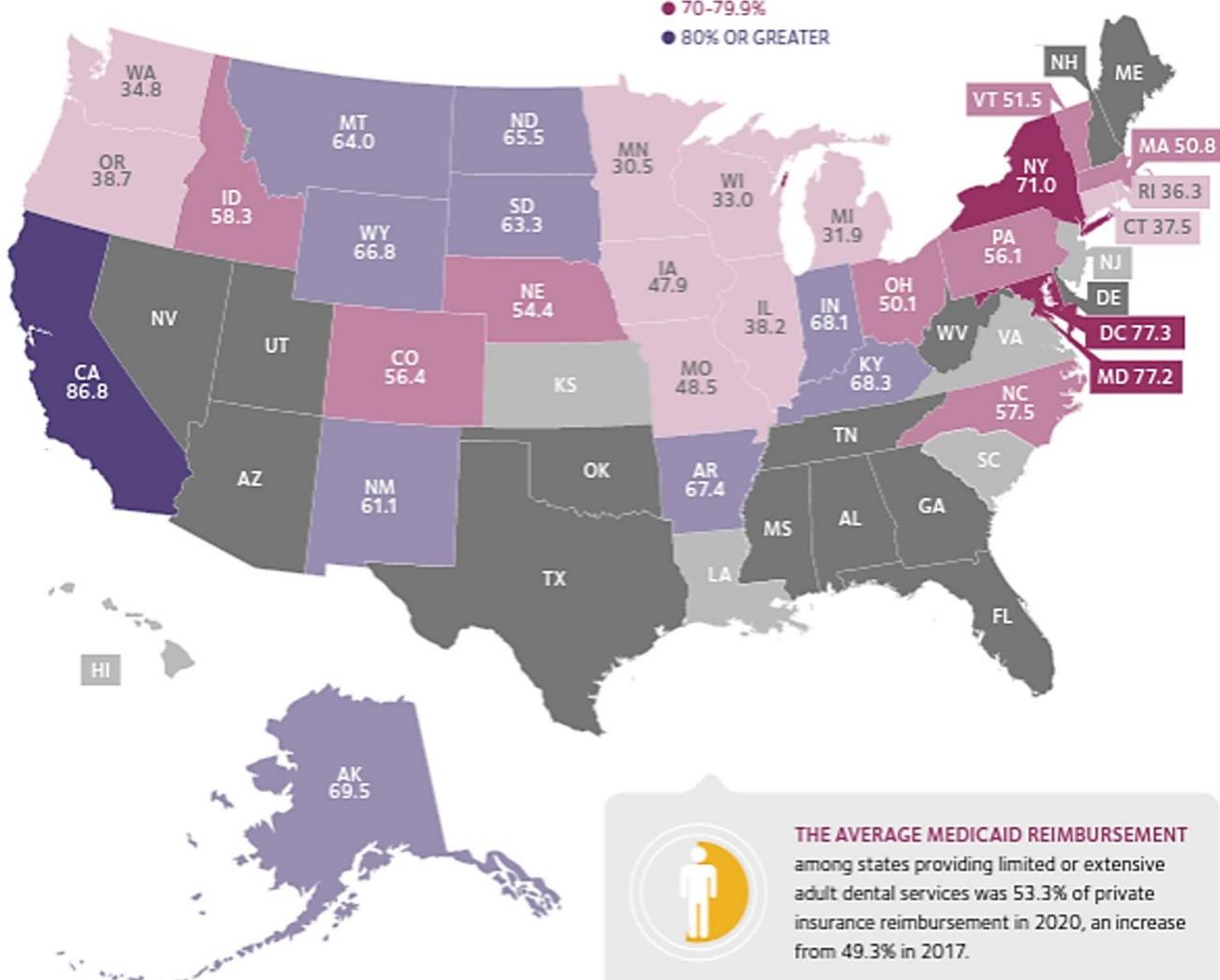
Exhibit 23

In 2020, Pennsylvania Ranked 17th and 30th Among All States for Medicaid Dental Reimbursement Rates for Adults and Children, Respectively



MEDICAID REIMBURSEMENT AS A PERCENTAGE OF PRIVATE INSURANCE REIMBURSEMENT FOR ADULT DENTAL SERVICES, 2020

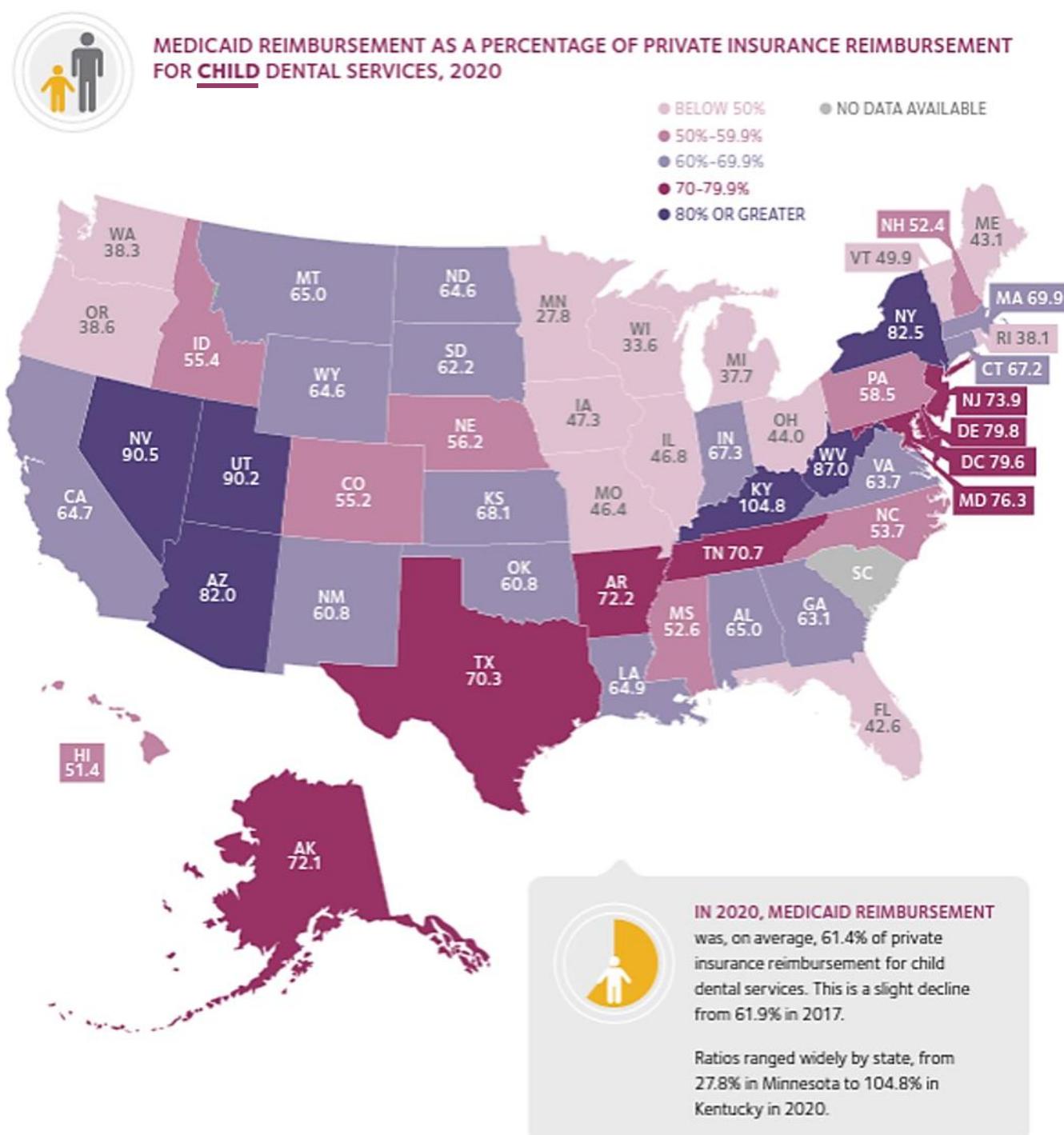
- BELOW 50%
- 50%-59.9%
- 60%-69.9%
- 70%-79.9%
- 80% OR GREATER
- NO BENEFIT OR EMERGENCY ONLY
- LIMITED OR EXTENSIVE – NO DATA AVAILABLE



THE AVERAGE MEDICAID REIMBURSEMENT
among states providing limited or extensive
adult dental services was 53.3% of private
insurance reimbursement in 2020, an increase
from 49.3% in 2017.

Medicaid reimbursement as a percentage
of private insurance reimbursement for
adult dental services varied between 30.5%
in Minnesota to 86.8% in California.

Exhibit 23 continued.



Source: ADA.

In 2020, Pennsylvania's MA program reimbursed dentists for 56 percent of the total cost for adult dental services compared to the payout for private insurance. This places the commonwealth 17th in the country, and slightly above the national average of 53 percent. The reimbursement rate for child dental services was approximately 59 percent, which is 30th in the nation and below the U.S. average of 61 percent.

In addition, it is also worth noting the change in reimbursement rates over time. The ADA reported that, when compared to private insurance reimbursement, Medicaid reimbursement rates for adult and child dental services in Pennsylvania declined by five percent and six percent, respectively, between 2017 and 2020. This either exceeds or is counter to the national trend in both instances. National reimbursement rates for child dental services only declined at a half of a percent during that time period, whereas rates for adult services increased by four percent.

There are several explanations for the trends seen above. First, CMS requires all states provide children under the age of 21 with preventative and medically necessary healthcare services – including dental care – under the Early and Periodic Screening, Diagnostic and Treatment (EPSDT) benefit within Medicaid.¹⁵⁶ While states still have flexibility to determine their own reimbursement rates, the EPSDT benefit does set a minimally acceptable threshold for the coverage which states must provide to children.¹⁵⁷

On the other hand, dental care for adults is not considered to be a mandatory service under Medicaid. As a result, many states only provide reimbursement for limited or emergency dental care services for adults.¹⁵⁸ This can likely explain why reimbursement rates for many states, including Pennsylvania, are higher for child dental care services than that of adults.

Second, it is important to highlight that reimbursement rates for both adult and child dental services decreased compared to private insurance in Pennsylvania between 2017 and 2020. To this point, it should be noted that, generally speaking, dental care is seen as an "add on" benefit within many state Medicaid programs. As such, these services typically do not experience the same annual funding increases as do many other

CMS requires states to provide children under the age of 21 with preventative and medically necessary oral healthcare services under Medicaid.

¹⁵⁶ See <https://www.medicaid.gov/medicaid/benefits/early-and-periodic-screening-diagnostic-and-treatment/index.html>, accessed October 24, 2022.

¹⁵⁷ ADA, *Making the Case for Dental Coverage for Adults in All State Medicaid Programs*, 2021.

¹⁵⁸ Ibid.

government healthcare programs.¹⁵⁹ Pennsylvania did not increase provider reimbursement rates any year between 2017 and 2020.¹⁶⁰ National expenditures on dental care, however, increased five percent over this same period.¹⁶¹ Therefore, it is reasonable to conclude that MA reimbursement rates in Pennsylvania declined over the five-year window not because of a reduction in provider compensation, but rather due to a stagnation in reimbursement compared to private insurance, an industry which must keep pace with the rising market costs for dental services.

Overall, these trends explain why dentists may be reluctant to increase their participation in the MA program. Dentists are already put at a financial disadvantage when they serve MA patients, as they are reimbursed at almost half the rate as they would be when providing the same care for an individual with private insurance. When taking into consideration the divergence between Medicaid reimbursement rates and dental care expenditures, refusing to accept additional MA patients becomes a necessary business decision for many dental practices. Although similar decisions occur across Pennsylvania, such trends disproportionately affect MA recipients in rural counties, where we documented the short supply of dentists that participate in the Medicaid program.

It is important to note the impact that the coronavirus pandemic has made on this situation. As noted earlier, the speed in which dental care expenditures have increased has only accelerated since 2020.¹⁶² Although data is still emerging in this area, stakeholder groups have anecdotally told us that the pandemic has created a backlog of appointments for many dentists.¹⁶³ Combined, these factors only increase the likelihood of providers choosing to serve patients with higher compensation rates than that of the MA program.

Pennsylvania’s Medicaid Covered Dental Services Compared to Other States

For low-income populations, the discussion on access to dental services is not merely limited to their geographic proximity to providers who participate in Pennsylvania’s MA program. For adults enrolled in the MA

¹⁵⁹ Ibid.

¹⁶⁰ See <https://www.kff.org/medicaid/state-indicator/states-reporting-provider-rate-increases/?currentTimeframe=1&selectedRows=%7B%22states%22%7B%22pennsylvania%22%7B%7D%7D%7D&sortModel=%7B%22colId%22%22Location%22,%22sort%22%22asc%22%7D>, accessed October 24, 2022.

¹⁶¹ See <https://www.ada.org/resources/research/health-policy-institute/dental-care-market>, accessed October 21, 2022.

¹⁶² Costs for dental services increased by 1.9% between May and June 2022, which is the largest month-over-month increase since the U. S. Bureau of Labor Statistics began tracking such changes in 1995. See BLS, *Consumer Price Index – August 2022*, 2022.

¹⁶³ Similar findings were reported in a recent study of the Connecticut Medicaid system. See Connecticut Oral Health Initiative, *A Medicaid Gap Analysis of Oral Health Care for Adults in Connecticut*, 2022.

program, the types of dental services available through MA can be a significant barrier to access.¹⁶⁴ This topic is significant since, without the ability to obtain additional dental care coverage on their own, low-income adults are often limited to the services they can receive under MA.

In our research, we found that stakeholder groups such as the ADA,¹⁶⁵ the Center for Health Care Strategies (CHCS),¹⁶⁶ and others generally group adult dental care coverage under Medicaid into distinct categories. As of 2021, nine states provide only for relief of pain in **emergency** situations (e.g., tooth extraction). Sixteen states, including Pennsylvania, offer **limited** coverage, which is defined as coverage for fewer than 100 ADA-recognized diagnostic, preventative, and minor restorative procedures, or a per-member annual expenditure limit of \$1,000 or less. Twenty-two states offer **extensive** coverage of over 100 diagnostic, preventative, and minor restorative procedures approved by the ADA and have an annual member expenditure cap of over \$1,000. Finally, four states either provide **no dental coverage** to adults under Medicaid, or currently have a coverage plan **under development**.¹⁶⁷

For a more comprehensive review of dental services covered at the state level, we turn to the *Medicaid Adult Dental Coverage Checker*.¹⁶⁸ Produced in 2020 by the ADA, CHCS, the National Academy for State Health Policy (NASHP), and the CareQuest Institute, this survey of state dental directors analyzes and scores each state on a scale of 0 to 32 based on the level of dental services covered by Medicaid, including the following:

- **Annual Benefit Cap.** Details the per-member annual dollar amount coverage limit for dental services. One question graded on a scale of zero (no coverage) to six (no annual limit).
- **Diagnostic Services.** Details the coverage for both problem-focused and periodic oral evaluations. Two questions each graded on a scale of zero (no coverage) to two (coverage for the largest needy Medicaid population group).
- **Preventative Services.** Details the coverage for both prophylaxis (cleaning) and fluoride services. Two questions each graded on a scale of zero (no coverage) to two (coverage for the largest needy Medicaid population group at least twice a year).

¹⁶⁴ As noted above, CMS requires states to provide children under the age of 21 with comprehensive dental coverage under the EPSDT benefit.

¹⁶⁵ ADA, *Making the Case for Dental Coverage for Adults in All State Medicaid Programs*, 2021.

¹⁶⁶ CHCS, *Medicaid Adult Dental Benefits: An Overview*, 2019.

¹⁶⁷ The District of Columbia is also included in our consideration of state dental coverage under Medicaid.

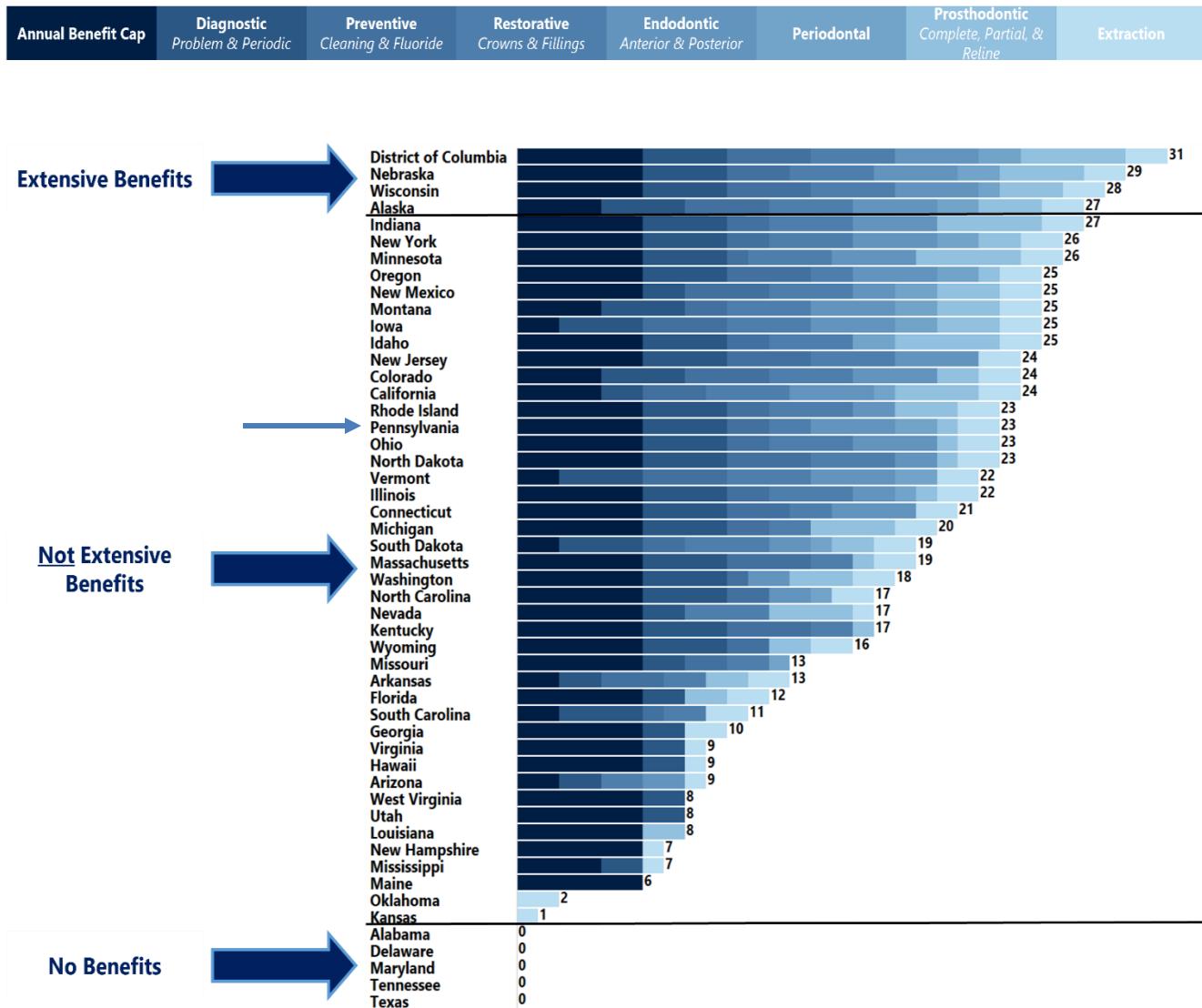
¹⁶⁸ See https://www.carequest.org/Medicaid-Adult-Dental-Coverage-Checker?utm_source=newsletter&utm_medium=email&utm_campaign_name=ncsl&utm_source=National+Conference+of+State+Legislatures&utm_campaign=f438a90b5f-Today_Aug_31&utm_medium=email&utm_term=0_1716623089-f438a90b5f-377900884, accessed October 25, 2022.

- **Restorative Services.** Details the coverage of procedures that mitigate the need to remove teeth (e.g., fillings), or the implementation of crowns to replace lost teeth. Two questions each graded on a scale of zero (no coverage) to two (coverage for the largest needy Medicaid population group).
- **Endodontic Services.** Details the coverage for anterior and posterior dental pulp (interior tooth) treatments and procedures (e.g., root canals). Two questions each graded on a scale of zero (no coverage) to two (coverage for the largest needy Medicaid population group).
- **Periodontal Services.** Details the coverage for procedures that treat diseases of the gums or other root structures of the tooth. One question graded on a scale of zero (no coverage) to two (coverage for the largest needy Medicaid population group at least once a year for planning and twice a year for maintenance).
- **Prosthodontic Services.** Details coverage for complete, partial, or reline denture procedures. Three questions each graded on a scale of zero (no coverage) to two (coverage for the largest needy Medicaid population group more than once every five years).
- **Extraction Services.** Details the coverage for tooth extraction procedures. One question graded on a scale of zero (no coverage) to two (coverage for the largest needy Medicaid population group).

From these survey scores, each state is categorized as either "extensive," "not extensive," or "no benefit." According to the *Medicaid Adult Dental Coverage Checker*, states with "extensive" benefits must have a total survey score of at least 19, avoid having "no coverage" in any of the categories listed above, and must have an annual benefit dollar amount limit of at least \$1,000. We have included the scores for all states and the District of Columbia in Exhibit 24.

Exhibit 24

Pennsylvania Tied for the Ninth Highest Medicaid Dental Benefits Score in 2020



Source: Developed by LBFC staff from the *Medicaid Adult Dental Coverage Checker*.

As shown in the Exhibit 24 above, only three states – Nebraska, Wisconsin, and Alaska – and the District of Columbia - met the criteria to be considered as having “extensive” dental benefits for Medicaid adults. Five states were deemed to have no dental benefits as part of their adult

Medicaid coverage.¹⁶⁹ The vast majority of the remaining states (42), including Pennsylvania, are all considered to "not offer extensive dental benefits as part of its Medicaid plans." However, within this category, there is a wide range of scores from a low of one (Kansas) to 27 (Indiana),¹⁷⁰ which reveals a significant variance in the types of services covered by the states.

Pennsylvania was tied for the ninth highest Medicaid dental benefits score in 2020. Upon further review, the commonwealth met two of the three criteria to be considered a state with "extensive" dental Medicaid benefits, but it failed to provide coverage in several key categories, including: no coverage for preventative fluoride treatments, restorative crowns procedures, and both complete and partial denture services. As we will discuss later, the lack of access to preventive care can lead to higher costs later, if the dental problems require a medical intervention.

E. Consequences of Lack of Access to Dental Services

In this issue area, we will briefly highlight several of the most significant consequences that result from inadequate access to oral healthcare services. Most dental diseases and related oral health issues are not self-healing. In most cases, these diseases become increasingly destructive without treatment over time.¹⁷¹ As a result, some individuals who lack proper access to dental services ultimately seek emergency care for treatment. The ADA has found that, on average, someone in the United States visits a hospital emergency department (ED) for dental-related conditions every 15 seconds.¹⁷²

On average, someone in the United States visits a hospital emergency department for dental-related conditions every 15 seconds.

To explore this issue in the commonwealth, we obtained data from the Pennsylvania Health Care Cost Containment Council (PHC4), which is an independent state agency that collects inpatient hospital discharge and ambulatory/outpatient procedure records from hospitals and freestanding ambulatory surgery centers in Pennsylvania. This data, which includes hospital charge and treatment information, as well as other financial data, is collected on a quarterly basis and is then verified by PHC4 staff.¹⁷³

¹⁶⁹ Since this survey was collected in 2020, it is important to note that its results vary slightly from the 2021 analysis from the ADA and CHCS reported earlier in this section. For example, Delaware has been upgraded from a state with no dental benefits to a state that is deemed to offer limited dental benefits.

¹⁷⁰ Indiana did not meet the "extensive" benefits criteria due to scores of zero in the preventative fluoride and periodontal services categories.

¹⁷¹ Mertz, *The Dental-Medical Divide*, 2016.

¹⁷² ADA, *Emergency Department Visits for Dental Conditions – A Snapshot*, 2020.

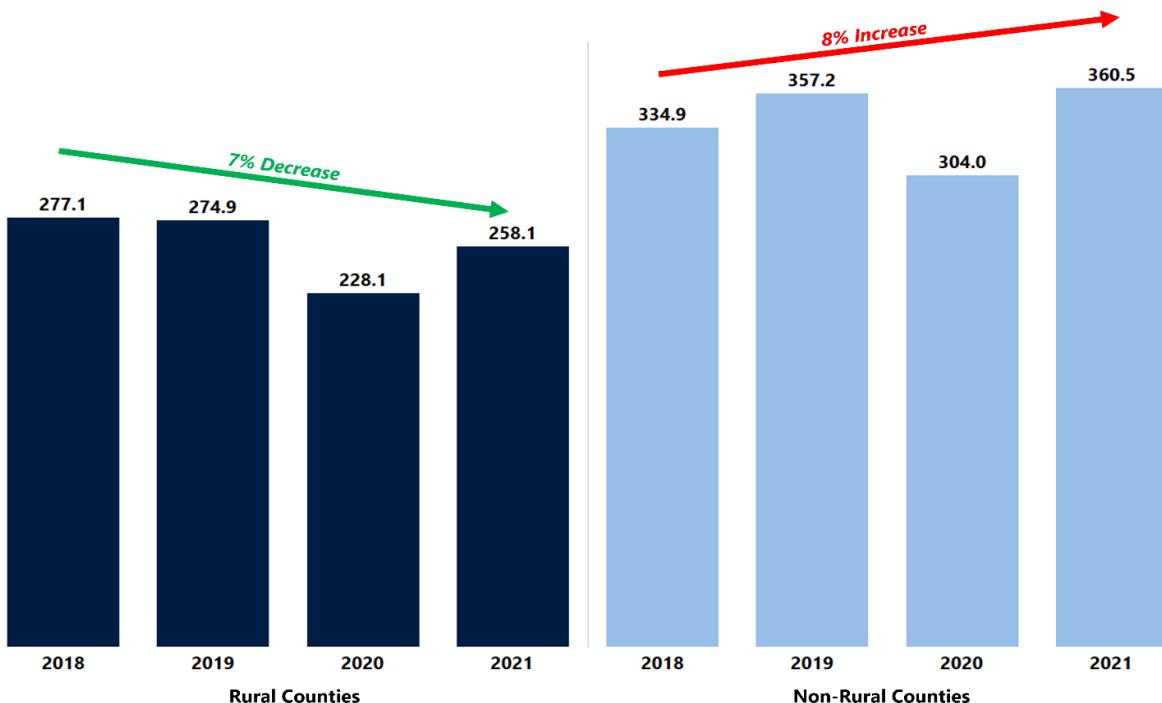
¹⁷³ See <https://www.phc4.org/council/mission.htm>, accessed November 3, 2022.

Data that is reported to PHC4 comports with standards developed by the World Health Organization (WHO) and the United States Centers for Disease Control (CDC), and the International Classification of Diseases, Clinical Modification (ICD-CM). The ICD-CM is the official system of assigning codes to diagnoses and procedures associated with hospital utilization in the United States; consequently, it provides a uniform method of querying data to identify specific illnesses, including dental-related issues.

Using PHC4's data, we obtained the number of ED hospital visits between 2018 and 2021 that had a diagnosis related to "diseases of the oral cavity and salivary glands" and "dentofacial anomalies." The data was further grouped by the patients' county of residence. In Exhibit 25, we show the trend in total ED visits per 100,000 residents over time. County-specific metrics can be found in Appendix D.

Exhibit 25

Rural Counties Saw a Decline in Dental-Related Emergency Department Visits between 2018 and 2021 (Total Visits Per 100,000)*



Note:

*/Counties with less than 10 ED visits were excluded from the PHC4 data.

Source: Developed by LBFC staff from information provided by PHC4.

Statewide, average dental-related ED visits increased from 309 per 100,000 residents in 2018 to 315 per 100,000 residents in 2021, a change of slightly under two percent.¹⁷⁴ However, there is a distinction in the trends between rural and non-rural counties. Over the four-year period, dental-related ED visits decreased by seven percent among rural counties, whereas non-rural counties experienced an increase of eight percent.

These trends were unexpected given the geographic distribution of dentists discussed in Issue Area A.¹⁷⁵ Overall, we anticipated that non-rural counties would have higher aggregated ED visits based purely on population (e.g., more people = more ER visits). However, we hypothesized that rural counties would be more likely to see increases in ED visits over time, due to the relative shortage of dentists in these areas.

There are a few possible explanations as to why these trends occurred. First, previous research by the ADA found that dental-related ED visits were highest among individuals aged 19 to 34, with an increase of total visits over time experienced by the 26 to 34 age group. Additionally, individuals aged 65 and older made up the smallest share of dental-related ED visits according to the ADA.¹⁷⁶ Further, on average, rural Pennsylvanians are older than their non-rural counterparts.¹⁷⁷ Consequently, the unexpected trends we observed might be explained by these age-related access nuances. However, it is important to note that since the PHC4 data did not include demographic information on the ED visits, we were unable to test this possibility further.

Second, it is possible that residents in rural areas were not utilizing ED treatment for dental-related issues because of a lack of access to hospital emergency departments. The decline of rural hospitals, which were already in limited supply, has been documented by the United States Government Accountability Office (GAO) in recent years.¹⁷⁸ This decline has been juxtaposed by a rise in alternative places of care, such as urgent care clinics, in rural America.¹⁷⁹ It is quite possible that rural Pennsylvani-

¹⁷⁴ The statewide average for the period was 304 dental-related ED visits per 100,000 residents, although it should be noted that the COVID pandemic severely reduced the number of total ED visits in 2020.

¹⁷⁵ In Issue Area A, we reported that the average population-to-provider ratio for rural counties was 3,961:1. The same average for non-rural counties was 2,272:1.

¹⁷⁶ ADA, *Emergency Department Use for Dental Conditions Continues to Increase*, 2015.

¹⁷⁷ According to the Center for Rural Pennsylvania, 20 percent of the rural population in Pennsylvania was over the age of 65 in 2020. This compared to 18 percent of the urban population. See <https://www.rural.pa.gov/data/rural-quicks-facts>, accessed November 3, 2022.

¹⁷⁸ In studying 100 rural hospital closures, the GAO found that the average travel time for rural residents to receive care increased by 20 miles between 2012 and 2018. See GAO, *Rural Hospital Closures: Affected Residents Had Reduced Access to Health Care Services*, 2021.

¹⁷⁹ Researchers at FAIR Health found that the number of insurance claims made to urgent care centers in rural areas of the United States increased by over 2,300 percent between 2007 and 2016, compared to an increase of 1,700 percent in non-rural areas. See FAIR Health, *FH Healthcare Indicators and FH Medical Price Index*, 2018.

ans were increasingly accessing treatment for dental-related issues at urgent care clinics as opposed to hospital emergency departments during our observation period. However, the current regulatory environment in which urgent care clinics operate in Pennsylvania (and the United States) makes quantifying this aspect difficult.¹⁸⁰

Approximately \$2.7 billion was spent on dental-related ED visits in the United States in 2017.

Nevertheless, these findings do have significant implications. The ADA estimates that \$2.7 billion was spent on dental-related ED visits in the United States in 2017.¹⁸¹ A considerable portion of these expenditures come at public cost, with Medicaid being the primary payer for 40 percent of these visits among adults and 69 percent of visits among children in that same year.¹⁸² Although it is still an emerging area of study, there is preliminary evidence to suggest that a focus on preventative measures could reduce these costs in the long-term. Studies have indicated that for every dollar spent on preventative dental care, anywhere between \$8 and \$50 can be saved from a reduction in restorative treatments and dental-related ED visits.¹⁸³

The trends highlighted above can have substantial individual consequences as well. Research has found that poor oral health is linked to a myriad of other health issues, including cardiovascular disease, diabetes, Alzheimer's disease, pneumonia, and pregnancy complications, among others. Although the medical science behind these connections is still not fully understood, experts believe that the relationship between poor oral health and these other conditions is mutual (one impacts the other and vice versa).¹⁸⁴

Once again, preliminary research suggests that a focus on preventative dental services could reduce the utilization of the healthcare system (es-

¹⁸⁰ Pennsylvania is one of 40 states that does not specifically address urgent care clinics in statute or regulation. Urgent care centers in the commonwealth operate under individual physician licenses. As a result, researchers have experienced difficulty in assessing the precise number of urgent care centers that currently operate in Pennsylvania. See Community Catalyst and the National Health Law Program, *Making "Convenient Care" the Right Care for All: Improving State Oversight of Urgent Care Centers and Retail Health Clinics*, 2021.

¹⁸¹ ADA, *Emergency Department Visits for Dental Conditions – A Snapshot*, 2020.

¹⁸² See <https://www.cdc.gov/chronicdisease/programs-impact/pop/oral-disease.htm>, accessed November 4, 2022.

¹⁸³ See <https://dentistry.uic.edu/news-stories/the-value-of-preventive-oral-health-care/>, accessed November 4, 2022.

¹⁸⁴ See <https://www.mayoclinic.org/healthy-lifestyle/adult-health/in-depth/dental/art-20047475>, accessed November 4, 2022.

pecially among the Medicaid population), and therefore result in an overall cost-savings.^{185,186} The CDC estimates that the national healthcare system could save up to \$100 million a year if screenings for diabetes, high blood pressure, and high cholesterol were included as part of dental visits.¹⁸⁷ Additional research on this issue and its implications for healthcare in Pennsylvania would be worthwhile; however, because the issue transcends just rural dental health, such analysis was outside the scope of this study.¹⁸⁸

¹⁸⁵ In the first comprehensive look at the association between dental services and ED/inpatient utilization and healthcare costs, a recent study of the New York state Medicaid system found that there were significantly lower healthcare costs for adults that received preventative dental care compared to those who did not have such treatment. See Lamster, et al., *Dental Services and Health Outcomes in the New York State Medicaid Program*, 2021.

¹⁸⁶ A similar study of commercial (non-Medicaid) patients in Arkansas found preventative dental care was associated with annual cost-savings between \$500 and \$1,700 for individuals with diabetes or coronary artery disease. See Borrah, et al., *Association Between Preventive Dental Care and Healthcare Cost for Enrollees With Diabetes or Coronary Artery Disease: 5-Year Experience*, 2022.

¹⁸⁷ See <https://www.cdc.gov/chronicdisease/programs-impact/pop/oral-disease.htm>, accessed November 4, 2022.

¹⁸⁸ DOH has stated that reducing total health care costs through the enhancement of oral disease prevention and integrating chronic disease prevention into dental practices are a strategic priority in the 2030 Oral Health Plan. See DOH, *Pennsylvania Oral Health Plan, 2020-2030*, 2020.

SECTION V

POTENTIAL STRATEGIES FOR EXPANDING ACCESS TO RURAL DENTAL CARE



Fast Facts...

- ❖ *With the number of dentists and dental support staff decreasing, strategies aimed at boosting both workforces should incentivize practicing in rural areas.*
- ❖ *To better assess mobile dentistry and teledentistry, the General Assembly should consider codifying both methods of service.*
- ❖ *Further expanding basic oral healthcare services into other settings, such as primary care, social services, and educational environments, could help to improve access to dental care in rural communities.*

Overview

Throughout this report, we have analyzed and discussed accessibility to oral healthcare services in rural Pennsylvania in several ways. In Section III, we outlined the availability of dental services in Pennsylvania based on population, geographic distribution, and income status. Costs and barriers to dental care in rural communities were discussed in Section IV, including how the declining dentist workforce, practice patterns among recently graduated dentists, oral healthcare costs, and Medicaid benefit options can impact the ability of rural Pennsylvanians to receive services. In addition, we noted the impact that poor oral healthcare can have on personal well-being and healthcare system costs overall.

In this final section, we explore ways to improve access to oral healthcare services for rural Pennsylvanians. Overall, we found that expanding dental services accessibility to rural areas is a complex and multifaceted issue. While some policy options may have more direct impact than others, we believe that there is no single recommendation to be made that could immediately address the issue. However, we discovered that there are many different approaches that have been implemented throughout the commonwealth and in other states to increase dental services in rural areas. In the discussion that follows, we highlight some of the more impactful or promising strategies that we feel should be considered by the General Assembly, oral healthcare stakeholders, and other policymakers to improve access to dental services in rural areas over time.

First, we examined strategies to boost the number and geographic distribution of dentists in the workforce. We found that there are several possible reasons why dentists are choosing to leave Pennsylvania, including lower salaries compared to neighboring states, lack of access to dental support personnel, and the number of out-of-state students attending dental school in Pennsylvania. Emerging research suggests there is a correlation between the location of origin of dental students and where they ultimately decide to practice after graduation. ADA studies have shown that in-state dental school students originally from rural areas are three times more likely to practice in rural communities upon graduation and are significantly less likely to leave the state to practice.¹⁸⁹ We conclude that if rural access to dental services continues to be problematic,

¹⁸⁹ Vujicic, Sarrett, and Munson, *Do Dentists from Rural Areas Practice in Rural Areas?*, 2016.

there may be benefit in exploring strategies that will increase the number of rural students in dental schools.

Given the impact that educational debt could have on the practice patterns of recently graduated dentists (see Section IV), we also discussed tuition assistance and reimbursement strategies that could incentivize providers to practice in rural areas. We reviewed the Primary Care Loan Repayment Program (LRP), a program administered by the Pennsylvania Department of Health (DOH) that can reimburse up to \$80,000 for providers (including dentists and dental hygienists) who choose to practice in shortage areas. We found that Pennsylvania is one of 37 states (including the District of Columbia) that publicly documented details regarding loan reimbursement programs, and that the LRP is comparable to initiatives used in other states. Between 2019 and 2022, approximately 25 percent of all LRP award recipients were oral healthcare providers, but only a quarter of those grantees were practicing in rural areas. While legislation was introduced during the 2021-2022 General Assembly session that would have expanded student loan forgiveness programs for Pennsylvania residents entering the field of dentistry, we found that a consistent drawback of loan reimbursement programs is the inability to convince providers to practice in rural areas for the long term. We offer several suggestions which could potentially strengthen student loan forgiveness programs, including expanding eligibility to current dental students, providing incentives for providers to extend their service in reimbursement programs, and increasing the time commitments for providers who wish to serve rural areas on a part-time basis.

Mobile dentistry and teledentistry have emerged to be viable alternatives for expanding access to some basic dental services for rural Pennsylvanians.

Mobile dentistry and teledentistry have emerged to be viable alternatives for expanding access to some basic dental services for rural Pennsylvanians. However, the current lack of a regulatory environment for mobile dentistry and teledentistry in many states, including Pennsylvania, has made it difficult to quantifiably measure both methods of service. Therefore, in this section we explored the benefits and drawbacks of mobile dentistry and teledentistry more broadly. There are several advantages to including these methods of service in the existing oral healthcare model, including the ability to reduce travel burdens for patients, streamline services for dental offices, and reduce costs for both patients and providers. However, there are also challenges that must be considered to make mobile dentistry and teledentistry sustainable for rural areas. We found that the limitation of services offered, the ability to provide continued care, the availability of broadband internet, and long-term financial viability concerns could be disadvantageous for both models of service. Since formal definitions for the models of service are currently limited, we suggest that a logical first step would be for the General Assembly to codify mobile dentistry and teledentistry to improve documentation efforts for private and public providers.

We explored other potential strategies that could be used to maximize the existing dentist workforce and improve access to oral healthcare services in Issue Area D. Much like dentists, dental support professionals have also experienced their own set of workforce challenges. Although the number of professionals in support staff roles that require additional training (public health dental hygiene practitioners, expanded functional dental assistants) have been on the rise, overall, the dental support staff workforce in Pennsylvania has been decreasing recently. We believe this is primarily due to low compensation and pandemic-related workforce issues. Most of these dental support professionals practice in non-rural areas, which impacts the ability of rural dental offices to operate at maximum efficiency. Moving forward, there may be value in considering strategies to boost the dental support staff workforce (similar to the dentist discussion above) or reduce workload currently facing dentists in the commonwealth.

The MORE Care collaborative has helped to train and educate primary care staffs at 13 rural health clinics located in six counties on tasks related to basic oral healthcare services.

In addition, we looked at how the integration of primary and oral healthcare could improve access to dental services in rural areas. Started in 2016, the Medical Oral Expanded Care (MORE Care) collaborative has helped to train and educate primary care staffs at 13 rural health clinics (RHCs) located in six counties¹⁹⁰ on tasks related to basic oral healthcare services, including administration of dental risk assessments, application of fluoride varnishes, and coordination with patients to set self-management oral healthcare goals. The collaborative was also one of the first programs in Pennsylvania to coordinate care between primary and oral healthcare providers. Expansion of similar programs could help to make inroads among patients who typically have been dissuaded from seeking dental treatment, which could help to reduce costs and improve overall health outcomes.

Finally, we reviewed several other innovative strategies from other states. These strategies include the integration of basic dental health concepts for community health workers and placing increased emphasis on oral health in educational settings. In our research, we found that states have looked to address a lack of dental services in rural areas in many unique ways. While we highlight several strategies applicable to the commonwealth, we encourage the General Assembly and oral health stakeholders to consider all policy options aimed at improving dental services access in rural Pennsylvania.

¹⁹⁰ These counties are Cameron, Carbon, Crawford, McKean, Potter, and Schuylkill.

A. Dentists in the Workforce

We previously noted that only three states have more accredited dental schools than Pennsylvania.¹⁹¹ In Section IV, we highlighted that there were slightly over 6,000 dental school graduates in 2019,¹⁹² of which approximately 360 (six percent) attended either Temple, Penn, or Pitt in any given year.¹⁹³ Ideally, the commonwealth should be able to retain most of those graduating dentists to help replace the outflow of providers from the state.¹⁹⁴ However, PCOH/ADA found that less than four percent of total graduates under the age of 35 (the age group of most graduates) stayed in Pennsylvania between 2010 and 2020.¹⁹⁵ As a result, only approximately 240 (70 percent) of Pennsylvania-based dental school graduates stayed in Pennsylvania – most of which were not based in rural areas of the state.

Why is Pennsylvania Losing Dental Graduates to Other States?

Like any graduate, new dentists must factor a variety of options when choosing where to establish their career. Each of these factors are as unique as the individual; therefore, there are no explicit indicators as to why Pennsylvania does not retain a higher percentage of the dentists trained in its borders. That being said, there are certain factors that may be contributing factors including:

- Salary Expectations.
- Access to Support Personnel.
- Out of State Dental Students.

Salary Expectations. Pennsylvania is in the bottom half of states when it comes to average dentist salaries. In 2018, Forbes noted that Pennsylvania ranked 41st in terms of average annual dentist salary.¹⁹⁶ As of May 2021, data published by the United States Bureau of Labor Statistics indicates that the commonwealth has an average annual dentist salary of approximately \$159,000, which would be 34th among all reporting

¹⁹¹ California (six), New York (five), and Texas (four) outpace Pennsylvania's three dental schools. Illinois, Florida, and Massachusetts also all have three dental schools within their respective states.

¹⁹² ADA and PCOH, *Access to Dental Care in Pennsylvania*, 2021.

¹⁹³ PCOH, *Access to Oral Health Workforce Report Part I*, 2022.

¹⁹⁴ In Section IV, we noted previous research that found 17 percent of dentists retired from the commonwealth's workforce between 2015 and 2020. In addition, we also noted that Pennsylvania was found to have the 11th highest departure rate of providers migrating out of the state at 2.5 percent.

¹⁹⁵ PCOH, *Access to Oral Health Workforce Report Part I*, 2022.

¹⁹⁶ See <https://www.forbes.com/sites/andrewdepietro/2019/11/22/dentist-salary-state/?sh=5bdeca803291>, accessed on November 22, 2022.

states.¹⁹⁷ While important on its own, this statistic is even more significant when considering that Delaware – a neighboring state with close proximity to two Pennsylvania-based dental schools – was found to have the highest average annual salary for dentists at almost \$234,000. Further, as PCOH notes in its recent report, West Virginia is the only neighboring state that currently has a lower average annual salary for dentists compared to Pennsylvania.¹⁹⁸

The COVID pandemic has exacerbated workforce issues across the oral healthcare industry.

Access to Support Personnel. A second possible explanation is the availability of dental support personnel, such as dental assistants and dental hygienists. According to numerous stakeholder groups, including PCOH and the Pennsylvania Office of Rural Health (PORH), this factor is valuable when determining dental practice locations. PCOH reports that Pennsylvania ranks in the middle to bottom half of states in terms of annual salaries for dental assistants and dental hygienists, respectively.¹⁹⁹ Further, the COVID pandemic exacerbated an existing trend of declining numbers of dental assistants in the commonwealth's workforce. As a result, most of the state falls below the ratio of two dental hygienists to one dentist that has been recommended by the PORH to maintain a safe and successful practice in rural areas.^{200,201}

Out of State Dental Students. Finally, another explanation may be present in the fact that when reviewing the ratio of in-state students to out of state students, Pennsylvania-based dental schools tend to have a higher ratio of out of state students.

The trend could likely be explained by several factors, primarily the highly competitive nature of attending dental school in the United States (with only 70 accredited programs nationally) and the limited class sizes of the three Pennsylvania-based dental schools – each with an average of less than 150 enrollees per year.^{202,203} With this in mind, we hypothesized that Pennsylvania-based dental schools may have lower acceptance rates of in-state students because the commonwealth has a higher share of the accredited dental schools in the country. However, at least preliminarily, this does not appear to be the case.

¹⁹⁷ See <https://data.bls.gov/oes/#/occGeo/One%20occupation%20for%20multiple%20geographical%20areas>, accessed on November 22, 2022.

¹⁹⁸ PCOH, *Access to Oral Health Workforce Report Part I*, 2022.

¹⁹⁹ Ibid.

²⁰⁰ Ibid.

²⁰¹ Studies have shown that a two-to-one ratio of dental hygienists to dentists can help a practice to expand its patient load while keeping overhead costs low, thus increasing financial viability. See Pennsylvania Office of Rural Health, *The Utilization of Dental Auxiliary Staff to Increase Access to Oral Health Care in Rural Areas: Filling an Unmet Need in Rural Pennsylvania*, 2018.

²⁰² In our conversations with dental school deans from across the commonwealth, it was noted that it would take considerable time and resources to expand both the physical infrastructure (classrooms, technical equipment, laboratories, etc.) and the clinical rotational programs needed to increase the class sizes of the DMD programs in the state.

²⁰³ Data from the ADA shows that Pennsylvania-based dental schools received between 1,000 and 3,000 applications per year between 2018 and 2021.

In our national comparison, we found that only three states with multiple dental schools had lower percentages of in-state students accepted between 2018 and 2021. Conversely, states with the largest number of dental schools, including Texas, California, and Florida, all had in-state acceptance rates that placed them in the top 15 nationally for the period.

While interesting, the results discussed above should be viewed with a degree of caution. Similar findings have been presented in the past by researchers at the ADA, but the interpretations and consequences of those results in terms of dental school enrollment have been inconclusive to date.²⁰⁴

As stated earlier, only six percent of the dentists in the state that attended dental school in Pennsylvania have practice locations in rural areas. The background of these students upon entering dental school could be a major contributor to explain this occurrence. It seems logical to assume that out-of-state students would be more inclined to return to their state of primary residence to practice upon graduation. Further, we would expect that the preexisting factors that increase the likelihood of dental school students locating in non-rural areas upon graduation (outlined in Section IV²⁰⁵) would only be enhanced if incoming students have no prior connection or exposure to the rural areas of Pennsylvania.

Although research on the topic is still emerging, there is early evidence to suggest that there is a correlation between the location of origin of dental students and where they ultimately decide to practice after graduation. Researchers from the ADA found that, between 2000 and 2014, students from rural Virginia that attended Virginia Commonwealth University's (VCU) School of Dentistry were three times more likely to practice in rural areas upon graduation compared to their non-rural counterparts. These students were significantly less likely to leave the state to practice as well.²⁰⁶ As a result, there are an increasing number of dental schools, including VCU and East Carolina University,²⁰⁷ that have made efforts to recruit prospective dental students from rural areas as part of outreach strategies for underserved populations. These may be viable strategies for Pennsylvania to consider if rural dental access becomes more problematic.²⁰⁸

²⁰⁴ Vujicic, *Where do dental school graduates end up locating?*, ADA, 2015.

²⁰⁵ These factors include a desire for a more metropolitan lifestyle, the financial viability of practicing in non-rural compared to rural areas, and increased practice opportunities that exist in non-rural areas – especially opportunities with DSOs.

²⁰⁶ Vujicic, Sarrett, and Munson, *Do Dentists from Rural Areas Practice in Rural Areas?*, 2016.

²⁰⁷ See <https://news.ecu.edu/2022/11/17/rural-dental-innovation/>, accessed November 23, 2022.

²⁰⁸ DOH has expressed support for programs that will increase the number of dentists in shortage areas as part of the 2030 Oral Health Plan. See DOH, *Pennsylvania Oral Health Plan, 2020-2030*, 2020.

B. Tuition Assistance and/or Reimbursement Strategies

Another potential strategy to encourage dentists to practice in rural areas is tuition assistance and/or reimbursement. As noted in Section IV, the ADEA found that the average educational debt for dental school graduates in 2021 was over \$301,000, which we concluded was likely a major influence on recent graduates to settle in non-rural areas where more employment opportunities exist.²⁰⁹ In this current climate, many states have looked at initiatives to incentivize dentists (and other providers) to practice in underserved areas.

Pennsylvania Primary Care Loan Repayment Program

DOH expects to award a total of \$1.5 million in LRP funding to 60 recipients across all disciplines in 2023.

Pennsylvania currently offers such a program through its Primary Care Loan Repayment Program (LRP). Administered by the Pennsylvania Department of Health (DOH), the LRP is designed to improve the recruitment and retention of healthcare providers and services in underserved communities. To qualify, eligible providers – including dentists and dental hygienists – must work in a designated health professional shortage area (HPSA) or serve at least 30 percent low-income patients for a period of two years. Dentists who meet these requirements are eligible to receive up to \$80,000 of repayment for eligible educational debt for a full-time two-year commitment (\$40,000 for a part-time commitment).²¹⁰ In 2023, DOH expects to award a total of \$1.5 million in funding to 60 recipients across all disciplines.²¹¹

From our research, it appears that the LRP is comparable to initiatives used in other states. The ADEA maintains a list of state and federal loan forgiveness programs that are open to dentists, dental hygienists, and allied dental providers.²¹² We found that Pennsylvania is one of 37 states (including the District of Columbia) that publicly documented funding award amounts of loan forgiveness programs for dentists who serve in HPSAs or provide care to underserved populations.²¹³ Although programs vary by size, commitment length, or service requirements (e.g.,

²⁰⁹ We also found four-year tuition costs for Pennsylvania's three dental schools to be \$212,000 (Pitt), \$261,000 (Temple), and \$332,000 (Penn). This does not consider additional fees that may be charged to students within the DMD programs.

²¹⁰ Physicians and psychologists are also eligible for this level of reimbursement. All other disciplines (including dental hygienists) can receive up to \$48,000 for a full-time service commitment and \$24,000 for a part-time service commitment. See DOH, *Primary Care Loan Repayment Program*, 2021.

²¹¹ DOH, *Request for Application Pennsylvania Primary Care Loan Repayment Program (RFA Number 67-149)*, 2022.

²¹² See <https://www.adea.org/advocacy/state/loan-forgiveness-programs.aspx>, accessed November 28, 2022.

²¹³ An additional 10 states operated similar programs, but either did not explicitly express a requirement for dentists to serve HPSAs, did not disclose funding award amounts for their programs, or had funding award amounts that varied by the number of applicants or state allocations. For clarity, these states were removed from our analysis.

number of patients seen), only four states – Delaware, Florida, Nebraska, and South Dakota – have annual loan repayments higher than the maximum yearly amount set in Pennsylvania (\$40,000 per year).²¹⁴

We reviewed data on the LRP program and found that between 2019 and 2022, there were a total of 228 grant recipients.²¹⁵ Of that number, 40 were dentists and 14 were dental hygienists or public health dental hygiene practitioners (PHDHPs), which collectively represents 24 percent of all awardees.²¹⁶

Between 2020 and 2022, only 25 percent of dental LRP award recipients practiced in rural counties.

However, rural oral healthcare professionals consist of a small share of the LRP awards granted to dental applicants. PCOH tracked county information for each of the 40 dental award recipients – including dentists and dental hygienists – between 2020 and 2022 and found that only 10 oral healthcare professionals (25 percent) were in rural counties during that time.

Given the present need to replace dentists leaving the commonwealth's workforce, expanding incentives for dentists within the LRP may be a viable option. House Bill (HB) 466 of 2021 would have created an expanded student loan forgiveness program for Pennsylvania residents entering the field of dentistry.²¹⁷ Under this proposal, dentists eligible for the LRP who also attended a commonwealth university or state-related institution would be able to receive up to \$200,000 in education loan forgiveness.²¹⁸ In exchange, the award recipient must provide three consecutive years of full-time service in a HPSA-designated location. Based on the information we reviewed from the ADEA, implementation of this program would give Pennsylvania the second-highest student loan forgiveness program in the country, falling only behind South Dakota.²¹⁹

One consistent drawback we have heard regarding student loan forgiveness programs is that while a program may be helpful in expanding access, the providers do not always form a lasting connection to the service area. According to one expert, many providers will serve their time in the program and then move away from rural areas; thus, reintroducing a void that needs to be filled. Nevertheless, there are additional considerations that can be made in the expansion of student loan forgiveness programs that can help to mitigate this issue.

²¹⁴ Kentucky and Wisconsin also had loan repayments that were documented as up to \$40,000 per year.

²¹⁵ Data for this review was obtained from PCOH, which works with DOH on the LRP program.

²¹⁶ On average, there were 35 dental applications and 195 total applications each year for the period. There were 138 dental and 781 total applications across all four years.

²¹⁷ HB 466 was referred to the House Education Committee on February 6, 2021. The legislative session has since ended. We are unaware if the bill will be reintroduced in the next legislative session.

²¹⁸ As outlined in the bill, students from the University of Pennsylvania would not be eligible.

²¹⁹ Nebraska's student loan forgiveness program is also valued up to \$200,000, but the state did not document the length of service required to receive this repayment.

First, the LRP is currently available only for established or recently graduated dentists who work at an approved LRP site location. In the future, programs could be opened to students currently in dental school. This may help to recruit students from underserved communities that may not be able to fund dental school by the financial assistance tools currently available. Additionally, service commitment times could be extended to account for the years of funding received.²²⁰

Second, the commonwealth could also offer additional reimbursement for dentists who are willing to extend their service within the program. This strategy has already been implemented in several instances, including in the neighboring states of Delaware,²²¹ Ohio,²²² and West Virginia.²²³ This could help to improve the continuation of services among practices in rural areas, as opposed to the biennial cycling of providers that currently exists within the LRP.

Finally, rather than decreasing the annual reimbursement rate for a part-time service commitment – as is the case with those currently in LRP – the commonwealth could consider increasing the length of commitment for such an arrangement. For example, in California’s state loan repayment program, recipients can either commit to two years of full-time service, or four years of part-time service.²²⁴ In addition to creating more long-term stability in rural areas, this consideration could incentivize participation in the program, as recipients could receive the same level of reimbursement without having to completely relocate to rural areas within the state.²²⁵

C. Mobile Dentistry and Teledentistry

In Section II, we noted that recent advancements in technology have allowed mobile dentistry and teledentistry to emerge in the oral healthcare landscape as viable alternatives for expanding access to rural Pennsylvanians. We then discussed how the current lack of a regulatory environment for mobile dentistry and teledentistry in many states, including

²²⁰ Mississippi has taken this model further and has opened its program to students in undergraduate predental education. In return, reward recipients must practice in an underserved community for a period equal to the number of years scholarship funding was received. See <https://www.adea.org/advocacy/state/loan-forgiveness-programs.aspx>, accessed November 28, 2022.

²²¹ Delaware allows recipients to extend for a third or fourth year within its student loan repayment program, with an annual award of up to \$50,000.

²²² Ohio increases the annual reimbursement in its program from \$25,000 to \$35,000 for dentists who extend for a third or fourth year.

²²³ West Virginia increases the annual reimbursement in its program from \$20,000 to \$25,000 for dentists who extend for an additional two years of service in shortage areas.

²²⁴ See <https://www.adea.org/advocacy/state/loan-forgiveness-programs.aspx>, accessed November 28, 2022.

²²⁵ DOH has stated its plans to develop or revise financial assistance programs for dental professionals who practice in rural areas as part of its 2030 Oral Health Plan. See DOH, *Pennsylvania Oral Health Plan, 2020-2030*, 2020.

Pennsylvania, has made it difficult to quantifiably measure both methods of service. In this issue area, we discuss mobile dentistry and teledentistry more broadly, and provide recommendations for next steps that the General Assembly can take regarding these options.

Advantages and Disadvantages of Mobile Dentistry and Teledentistry

Although it is difficult to review the performance metrics of mobile dentistry and teledentistry, we can conceptually discuss the benefits and drawbacks of these service delivery models. Overall, mobile dentistry and teledentistry have the potential to improve accessibility issues in many areas, but there are several key challenges that must be addressed to maximize the benefit of each for rural Pennsylvanians.

Advantages. Conceptually, mobile dentistry and teledentistry represent how modern technology can help to improve access to oral healthcare services in several ways. For rural areas, there is the potential for significant benefit from the inclusion of these methods of service in the existing oral healthcare model.

Reduce travel burdens. Mobile dentistry and teledentistry can help to expand access to individuals for whom travel is difficult. As we have noted throughout this report, rural counties have fewer dentists per capita, so as a result many rural Pennsylvanians must travel farther distances to seek care. However, mobile dentistry can bring services to a patient's immediate vicinity, and teledentistry can allow a patient to seek care without having to leave home. These benefits are further amplified for lower income individuals from rural areas who may not have access to private or public transportation. Additionally, the ability to bring care to patients is critically important to the elderly and other individuals who cannot easily travel to a dentist's office.²²⁶

Streamline services. With mobile dentistry and teledentistry, consultation appointments, exam follow-ups, and other basic services can be offered to patients outside of the existing dental office setting. As a result, in-office appointments can be used for those who require treatment, thus reducing the appointment wait times for many more advanced dental services. Additionally, conducting remote consultations (either by teledentistry or mobile clinics) allows oral health providers to triage patients, helping to make sure that those who are in the highest need for care receive treatment first.²²⁷

²²⁶ Virginia Health Catalyst, *Teledentistry in Virginia Implementation Toolkit*, 2022.

²²⁷ Ibid.

While there is benefit to the implementation of mobile dentistry and teledentistry services in rural Pennsylvania, several challenges will need to be considered and addressed moving forward.

Reduce costs. Many advocates view mobile dentistry and teledentistry as mechanisms to reduce costs for both patients and providers. In addition to these methods typically being less expensive compared to in-office appointments, cost savings for patients can be realized through reduced travel and prevented loss of income due to missed work. For providers with existing brick-and-mortar locations, supporters contend that the ability to triage patients makes dental offices more efficient, thus increasing profitability.²²⁸ Further, some research indicates that it may be less expensive for new dentists to establish mobile dental vans as opposed to the costs associated with starting a dental practice,²²⁹ although this topic area has not been fully explored.

Disadvantages. While there is benefit to the implementation of mobile dentistry and teledentistry services in rural Pennsylvania, it is important to note that these methods of service are still emerging. Several of the current challenges with these delivery methods are amplified in a rural setting. To promote the long-term sustainability of mobile dentistry and teledentistry in rural areas, these challenges will need to be considered and addressed moving forward.

Limitation of services. As we have noted previously, mobile dental and teledental services typically offer routine consultation and preventative services to patients. While this can be beneficial for creating more in-office availability, it is also a drawback to the methods of service themselves. If a patient requires additional treatment beyond basic dental care services, then they must seek out a dentist with availability at a brick-and-mortar location, thus reentering the cycle of accessibility issues.

Recurring care demands. On a similar thread, oral healthcare stakeholders expressed concerns about the ability of some mobile dentistry and teledentistry units to provide a full range of care for patients long-term. For example, several stakeholders we interviewed expressed apprehension with mobile dental units that do not frequently return to the same rural locations to provide care. While these units may be able to provide a minimum level of service to a wide area, no area will receive the reoccurring care needed to promote oral health over time. Further, for both mobile dentistry and teledentistry, if an emergency were to arise but the brick-and-mortar locations out of which these services were based were far away from rural areas, patients are left to either travel long distances or go to an emergency outpatient facility to seek care. As a result, there are increasing calls to have the mobile dental and

²²⁸ Ibid.

²²⁹ Douglass, *Mobile Dental Vans Planning Considerations and Productivity*, 2007.

teledental services in rural areas be part of localized “dental homes”²³⁰ that are in relative proximity to where services are offered.^{231,232}

Availability of broadband services and technology. A significant concern with using technology to extend care to rural patients arises from the availability of broadband internet services in many rural areas. A 2019 study from the Center for Rural Pennsylvania found that no counties in the commonwealth had at least 50 percent of their population with adequate broadband connectivity levels as defined by the Federal Communications Commission (FCC).²³³ Further, connection speeds were found to be substantially slower in rural counties as opposed to non-rural counties.²³⁴

The broadband connectivity issue impacts rural areas in relation to mobile dentistry and teledentistry in several ways. Both mobile dentistry (access to patient records, scheduling equipment, etc.) and teledentistry (access to video or audio conferencing) services rely on the internet to function. If internet connections are unreliable, slow, or nonexistent, then these methods of service are extremely hindered, if not entirely unusable. Further, as will be discussed below, teledentistry services that are reimbursed by the MA program must currently be conducted in real-time, which can be a challenge if a stable internet connection is not maintained between provider and patient.²³⁵

Finally, the availability of technology can also be a barrier to using these methods of service, especially teledentistry. While remote appointments can be used to expand routine dental services to individuals who cannot easily travel, these tools are not beneficial to those who either do not have access to internet-connected devices or do not have familiarity with using these devices.²³⁶

Long-term financial viability. There are also concerns over the long-term financial viability of both the mobile dentistry and teledentistry models for providers. Emerging research has speculated as to whether it

²³⁰ The Rural Health Information Hub from HRSA describes the dental home model as a comprehensive approach to oral healthcare for communities with limited access to services. This model focuses on the relationship between dentist and patient in a way that is continuous, coordinated, and family centered. See <https://www.ruralhealthinfo.org/toolkits/oral-health/2/dental-home-model>, accessed December 14, 2022.

²³¹ In our review of the national teledentistry landscape, we found that Idaho requires that dentists who provide teledentistry services must physically practice within 75 miles of the patient. See Idaho Administrative Code §24.31.01.

²³² DOH has stated expanded access to dental homes is a strategic priority in its 2030 Oral Health Plan. See DOH, *Pennsylvania Oral Health Plan, 2020-2030*, 2020.

²³³ There is disagreement in this area, however, as assessments conducted by the FCC show that most areas of Pennsylvania are covered by either fixed or mobile broadband. See <https://broadbandmap.fcc.gov>, accessed December 14, 2022.

²³⁴ The Center for Rural Pennsylvania, *Broadband Availability and Access in Rural Pennsylvania*, 2019.

²³⁵ DOH has expressed support for policies that will increase broadband access in rural areas in its 2030 Oral Health Plan. See DOH, *Pennsylvania Oral Health Plan, 2020-2030*, 2020.

²³⁶ Virginia Health Catalyst, *Teledentistry in Virginia Implementation Toolkit*, 2022.

is financially sustainable for dentists to offer primarily mobile dental services, especially if these services are administered to populations with lower insurance payment rates (e.g., the Medicaid population).²³⁷ Further, the technological equipment and software required to offer remote services such as teledentistry may be cost-prohibitive to some dental offices.²³⁸ Given that we have already expressed concerns over the financial feasibility of dentists working in rural areas,²³⁹ the costs associated with implementing these alternative forms of service on a wide scale in rural Pennsylvania must be considered in order to make them a viable solution.

Next Steps

Under the proper conditions, mobile dentistry and teledentistry can be used to help expand routine dental service access to rural areas of the commonwealth. While progress in this area is currently underway, evidence of this development is difficult to obtain, primarily because universal definitions are lacking within the oral healthcare industry. Consequently, a logical first step would be for the General Assembly to consider codifying the services of mobile dentistry and teledentistry in statute.

While DHS does currently provide a definition for teledentistry, it is important to note that this definition only applies to providers and insurance companies that operate in the MA program. While providers and insurance companies not involved with Medicaid can, and do, offer teledentistry services, there is liberty in how these services are offered (and subsequently tracked). Further, as we highlighted in Section II and referenced above, the current requirement for MA-reimbursed teledentistry services to be conducted in real-time presents a potential barrier for patients and providers with broadband issues in rural areas. Expansion of teledentistry services to allow for the ability of asynchronous monitoring – such as a patient saving documentation related to their dental issue and sending it to a provider for review (also known as “store-and-forward” technology)²⁴⁰ – would help to alleviate these concerns.

²³⁷ Thorsen and McGarvey, *Efficient Frontiers in a Frontier State: Viability of Mobile Dentistry Services in Rural Areas*, 2017.

²³⁸ Virginia Health Catalyst, *Teledentistry in Virginia Implementation Toolkit*, 2022.

²³⁹ In Section IV, we discussed how the high levels of educational debt experienced by many recently graduated dentists likely forces these providers to seek employment opportunities at established dental offices (primarily in non-rural areas), as opposed to opening their own practices. In addition, we also noted that dentists in rural areas may be less inclined to take on additional MA patients, due to lower reimbursement rates in the MA program when compared to private insurance.

²⁴⁰ See <https://telehealth.hhs.gov/providers/direct-to-consumer/asynchronous-direct-to-consumer-tele-health/#:~:text=Asynchronous%20telehealth%2C%20also%20known%20as,potential%20fraud%20or%20identity%20theft>, accessed December 14, 2022.

Introduced in the 2021-2022 legislative session, House Bill (HB) 1729 was intended to codify teledentistry services for both the public and private oral healthcare industries in the commonwealth. The bill would have required the State Board of Dentistry to promulgate regulations related to live interactive audio and video teledentistry services, as well as remote patient monitoring and store-and-forward technology. These regulations would apply to the MA program, as well as private providers and insurance companies in the commonwealth.²⁴¹

While there are currently references to mobile dentistry across various state guidelines, these references are vague and inconsistent. The State Board of Dentistry has recently considered issuing regulations regarding mobile dental vans,²⁴² but no formalized rules have been released to date. Much like HB 1729, future legislation codifying mobile dentistry would be a positive first step to formalizing the practice across the commonwealth. Beyond outlining which dental services may or may not be practiced in the mobile setting, it may be worth considering how to link mobile units to local dental practices in any future legislation.

While small, these steps can help to define and improve documentation for mobile dentistry and teledentistry among private and public providers over time. As a result, dental health providers, stakeholders, and researchers will be able to more thoroughly understand the impact that these service methods have on oral healthcare services across rural Pennsylvania.

D. Other Strategies

As we have referenced previously in this report, dentists are the central figures in oral healthcare. The most direct way to improve access to dental services across rural Pennsylvania is to address both the number and geographic distribution of dentists in the commonwealth. Throughout Section V, we have discussed potential strategies to increase the number of dentists who practice in rural areas. However, due to the extended schooling that is required to become a dentist, strategies centered on these providers will take several years before meaningful changes are realized. With this fact in mind, we also discussed mobile dentistry and teledentistry as a means to expand potential dentist service areas. Similarly, in this final issue area, we will explore other potential strategies that could be used to maximize the existing dentist workforce and improve access to oral healthcare services.²⁴³

²⁴¹ DOH has stated that adopting a teledentistry policy is a strategic priority in the 2030 Oral Health Plan. See DOH, *Pennsylvania Oral Health Plan, 2020-2030*, 2020.

²⁴² State Board of Dentistry, *Agenda for Board of Dentistry Meeting on November 18, 2022*, 2022.

²⁴³ DOH has stated its plans to explore new workforce models to utilize the current dental workforce as part of its 2030 Oral Health Plan. See DOH, *Pennsylvania Oral Health Plan, 2020-2030*, 2020.

Dental Support Staff

In Section II, we provided background on key positions within dental support staffs, such as dental assistants, expanded function dental assistants (EFDAs), dental hygienists, and public health dental hygiene practitioners (PHDHPs). We noted the various educational, preventative, and therapeutic services these professionals can provide, and in the case of PHDHPs, we highlighted that some services can be performed without the direct supervision of a dentist.

Researchers have noted that when used to their full professional capacities, dental support staffs improve the efficiency and effectiveness of dental offices.²⁴⁴ For example, when patients are first seen by dental hygienists to handle routine preventative services (e.g., cleanings, fluoride varnishes, etc.), then dentists can allocate more time to the advanced treatments that only they are clinically certified to perform (e.g., root canals, tooth extractions, application of filings, etc.). As a result, dental offices will have the capacity to treat additional patients. Maximizing the efficiency of dental offices is especially critical in rural areas, where dentists are in short supply.

Dental Support Staff Workforce. Much like dentists, dental support professionals have also experienced their own set of workforce challenges. In its recently released report on the oral healthcare workforce, PCOH uses a variety of sources²⁴⁵ to document the changes in employment among dental support professionals over the last several years.²⁴⁶ We have provided an illustrative summary of PCOH's analysis in Exhibit 26 below.

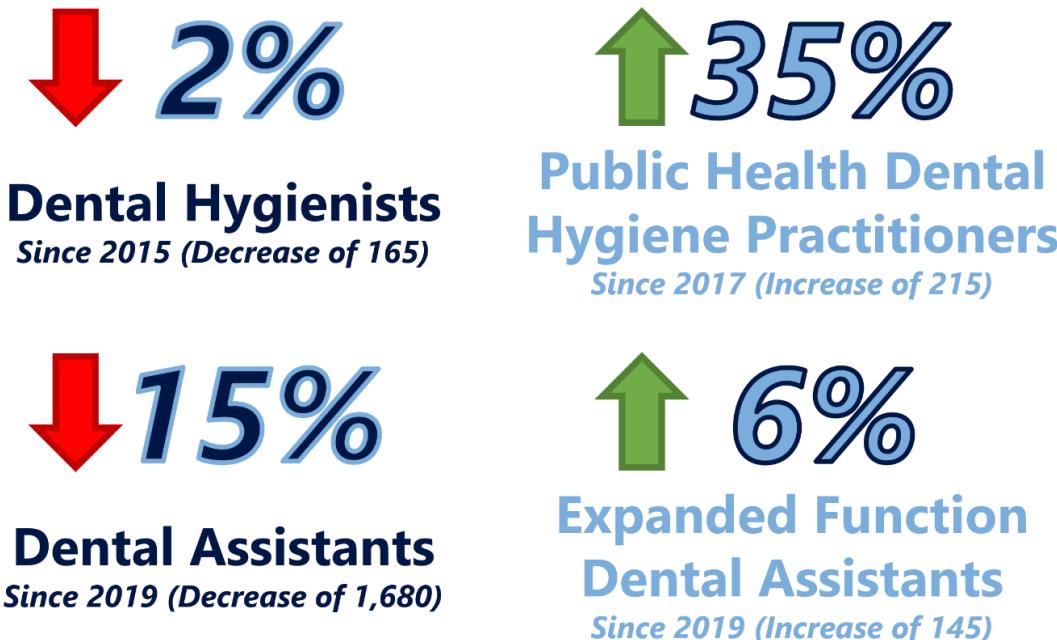
²⁴⁴ Pennsylvania Office of Rural Health, *The Utilization of Dental Auxiliary Staff to Increase Access to Oral Health Care in Rural Areas: Filling an Unmet Need in Rural Pennsylvania*, 2018.

²⁴⁵ Sources used in the PCOH report include surveys conducted by the organization, data from the U. S. Bureau of Labor Statistics (BLS), and licensure information from the Pennsylvania Department of State, among others.

²⁴⁶ PCOH, *Access to Oral Health Workforce Report Part I*, 2022.

Exhibit 26

Pennsylvania is Losing Dental Hygienists and Dental Assistants, While the Number of Professionals in “Expanded Capacity” Dental Support Staff Roles is Increasing



Source: Developed by LBFC staff from information provided by PCOH.

According to PCOH, Pennsylvania has been losing dental hygienists and dental assistants in recent years. The number of dental assistants in Pennsylvania dropped by 15 percent over a three-year period, decreasing from over 11,000 in 2019 to roughly 9,700 in 2021.²⁴⁷ In 2021, there were 7,900 licensed dental hygienists in the commonwealth, down from over 8,000 in 2015. This trend equates to approximately 61 dental hygienists per 100,000 population in Pennsylvania last year. The national average for the same time was 68 per 100,000 according to research conducted by PCOH.

Similar to our analysis of the dentist distribution, there appear to be discrepancies with the geographic distribution of dental hygienists. PCOH reports there were 59.6 dental hygienists per 100,000 residents in rural counties in 2021, compared to 61.2 per 100,000 in non-rural counties. However, the number of dental hygienists was increasing slightly in rural areas (up approximately 1.5 percent since 2015) compared to a small decline in non-rural portions of the state (3 percent decrease).

²⁴⁷ This number is reported from the U.S. BLS. PCOH cautions that data from BLS can include professionals that live in Pennsylvania but work in neighboring states.

Conversely, the number of expanded functional dental assistants (EFDAs) and public health dental hygiene practitioners (PHDHPs) increased in recent years according to PCOH. Since 2019, the number of EFDAs in the commonwealth has grown from 2,458 to 2,603, which is an increase of six percent. Licensed PHDHPs in Pennsylvania increased by 35 percent, growing from 614 practitioners in 2017 to 829 in 2021. However, most of these professionals practice in non-rural areas. PCOH reported that nearly 78 percent of EFDAs and 72 percent of PHDHPs practiced in non-rural counties in 2021.²⁴⁸ Additionally, it is important to note that the total number of EFDAs and PHDHPs is considerably smaller than that of either dental assistants or dental hygienists, and as a result do not counteract the losses that have been experienced in these professions over recent years.

There are several potential causes for the workforce departures discussed above. First, Pennsylvania ranks in the middle to bottom half of states in terms of annual salaries for dental assistants and dental hygienists. PCOH reports that the average hourly wage for dental assistants in Pennsylvania in 2021 (approximately \$21 per hour) ranked 22nd nationally. The average annual income for dental hygienist in Pennsylvania (\$71,700) fell considerably lower, ranking 44th out of all states in 2021. West Virginia was the only neighboring state that ranked below the commonwealth in earnings for both fields.²⁴⁹

The pandemic also significantly exacerbated staffing related issues for dental support personnel. Many support staff – in particular those who worked on a part-time basis – were furloughed at the start of the pandemic. Upon reopening of dental practices, large numbers of support personnel did not return, due in part to changes in pandemic safety requirements, vaccine mandates, and low compensation. Further, PCOH reports that dental hygiene and dental assisting training programs have produced fewer graduates since 2020 compared to pre-pandemic levels.²⁵⁰ We found these trends to mirror those found at the national level.²⁵¹

Impact of Dental Support Staff Workforce Shortages. In the discussion above, we note how dental support staffs can improve the efficiency and effectiveness of dental offices. Unfortunately, the inverse is also true considering workforce shortages. For example, PORH recommends that a ratio of two dental hygienists for every one dentist will help to safely increase a dental office's patient load while

²⁴⁸ PCOH, *Access to Oral Health Workforce Report Part I*, 2022.

²⁴⁹ PCOH does note that Ohio also fell behind Pennsylvania in terms of hourly wages for dental assistants. See Ibid.

²⁵⁰ Ibid.

²⁵¹ The ADA reports that nationally nearly four percent of dental hygienists voluntarily left the workforce in 2021, which coincided with a seven percent decline in enrollment for dental hygiene programs in the 2020-21 academic year. See ADA, *Dental Workforce Shortages: Data to Navigate Today's Labor Market*, 2022.

keeping overhead costs low.²⁵² PCOH's analysis found that 40 percent of counties in the commonwealth have a dentist-to-hygienist ratio of 1:1, which contributes to a statewide ratio that falls well below the 2:1 recommendation from PORH. On average, PCOH found that rural counties have 1.3 hygienists for every one dentist.²⁵³

It is critically important for dental offices in rural counties to operate at maximum efficiency, given the documented shortage of dentists in these areas. However, according to PCOH's analysis, this is improbable in many parts of the commonwealth. Based on the number and distribution of dental support staff across the state, in many areas dental offices may be severely limited in the number of patients served compared to their ideal capacities. Since most treatments in oral healthcare still require a visit to a brick-and-mortar location, access to dental services can be directly impacted by shortages in the dental support workforce.

Next Steps. Dental support staff play an important role in the administration of oral healthcare services across the commonwealth. Any efforts to increase the number of dentists in Pennsylvania should likely be met with strategies to increase the dental support workforce as well.

Currently there are 13 dental hygiene programs and at least 13 dental assistant training programs in Pennsylvania. On top of the enrollment challenges following the pandemic, we have been informed that – like dental school students – most graduates from these programs choose to practice in the vicinity of where they were trained.²⁵⁴ As a result, many dental support personnel currently practice in non-rural areas. We noted in Issue Area B that the LRP operated by DOH is currently open to dental hygienists and PHDHPs.²⁵⁵ Slightly over a third of all LRP dental awardees between 2019 and 2022 were hygienists or PHDHPs. In the future, if the General Assembly were to consider tuition assistance or student loan reimbursement strategies to encourage dentists to practice in rural areas, there may be value in allowing dental support personnel to be eligible for portions of funding as well.²⁵⁶

There are also emerging dental support fields that may be worth consideration in the commonwealth. Dental therapists are often described as the "physician assistants" of oral healthcare. Dental therapists can provide select preventative and restorative care services, such as filling cavities, placing temporary crowns, and extracting teeth (typically only on

²⁵² Pennsylvania Office of Rural Health, *The Utilization of Dental Auxiliary Staff to Increase Access to Oral Health Care in Rural Areas: Filling an Unmet Need in Rural Pennsylvania*, 2018.

²⁵³ PCOH, *Access to Oral Health Workforce Report Part I*, 2022.

²⁵⁴ Ibid.

²⁵⁵ DOH, *Primary Care Loan Repayment Program*, 2021.

²⁵⁶ DOH has stated its plans to develop or revise financial assistance programs for dental professionals who practice in rural areas as part of its 2030 Oral Health Plan. The agency has also expressed a desire to create a system for assessing the oral health workforce's capacity. See DOH, *Pennsylvania Oral Health Plan, 2020-2030*, 2020.

children). In some cases, these services can be provided without the direct supervision of a dentist. These midlevel providers can practice outside of traditional dental care settings, including in community clinics, RHCs, or schools.²⁵⁷ Dental therapists receive some crossover training with dentists, but currently CODA accreditation requires these providers to acquire three-years of formal academic and clinical experience.²⁵⁸

There are an increasing number of states that allowed the practice of dental therapy in some capacity. The earliest example was in 2004, when dental therapists were permitted to practice in Alaska's tribal communities.²⁵⁹ Currently, 14 states authorize the practice at the state or tribal level.²⁶⁰ Dental therapists may provide value to the oral healthcare workforce as an intermediary between other dental support staff and dentists.

These providers can perform more intricate services than other dental support personnel with direct access (without supervision) to patients (e.g., PHDHPs). Although dental therapists cannot conduct the same scope of procedures as dentists, they can enter the workforce at a much faster rate than individuals who attend dental school. However, with most statewide enactments of dental therapy only being passed in the last five to seven years,²⁶¹ the full impact of dental therapists on the oral healthcare workforce has yet to be determined. Therefore, while we cannot conclusively review the practice of dental therapy as an immediate solution, we can highlight its use and note its potential for additional consideration in Pennsylvania.

Integration of Primary and Oral Healthcare

In recent years, research has started to highlight the growing importance of "whole-person" healthcare. Advocates in this school of thought contend that the human body is fully interconnected; therefore, the healthcare system should not silo treatment in a way that excludes key components to overall health.²⁶² In terms of oral healthcare and a medical perspective, there does appear to be credence to this claim.

For example, in Section IV, we noted the linkage between poor oral health and other health issues, such as cardiovascular disease, diabetes,

²⁵⁷ See <https://www.pewtrusts.org/en/research-and-analysis/articles/2019/10/09/what-are-dental-therapists>, accessed December 20, 2022.

²⁵⁸ See <https://coda.ada.org/standards>, accessed December 20, 2022.

²⁵⁹ See <https://www.pewtrusts.org/en/research-and-analysis/articles/2019/10/09/what-are-dental-therapists>, accessed December 20, 2022.

²⁶⁰ See <https://oralhealthworkforce.org/authorization-status-of-dental-therapists-by-state/>, accessed December 20, 2022.

²⁶¹ See <https://www.pewtrusts.org/en/research-and-analysis/articles/2019/10/09/what-are-dental-therapists>, accessed December 20, 2022.

²⁶² Atchison, Rozier, and Weintraub, *Integration of Oral Health and Primary Care: Communication, Coordination, and Referral*, 2018.

Alzheimer's disease, pneumonia, and pregnancy complications. In addition, we pointed to preliminary research which indicates that a focus on preventive dental services could reduce healthcare costs long term.

One integrated care initiative of note that is currently underway in the commonwealth is the Medical Oral Expanded Care (MORE Care) collaborative. Started as part of a national pilot program in 2016,²⁶³ the MORE Care program began as a partnership between PORH²⁶⁴ and the Care-Quest Institute. The program focuses on integrating basic oral healthcare services into the rural primary care setting.²⁶⁵

The MORE Care collaborative aims to integrate primary and oral healthcare in several ways. The program has helped to train and educate primary care staffs at 13 rural health clinics (RHCs) located in six counties²⁶⁶ on tasks related to basic oral healthcare services, including administration of dental risk assessments, application of fluoride varnishes, and coordination with patients to set self-management oral healthcare goals. Working primarily with children,²⁶⁷ RHCs involved in the MORE Care program have created a localized dental referral network for patients in need of additional treatment, and work with dentists to follow up with individuals who skip dental appointments.²⁶⁸

Although there have been challenges²⁶⁹ over the last eight years, the MORE Care program has been able to tout several successes. The collaborative was one of the first programs in the state to coordinate care between oral and primary healthcare providers. In addition, several clinics have also hired their own PHDHPs and added dental equipment, which has helped to streamline overall care for patients by integrating some

The MORE collaborative was one of the first programs in the state to coordinate care between oral and primary healthcare providers.

²⁶³ As of 2022, MORE Care partnerships exist in South Carolina, Pennsylvania, Colorado, Virginia, Oregon, and Ohio. See <https://www.carequest.org/how-we-work/health-improvement-programs/more-care>, accessed December 7, 2022.

²⁶⁴ PORH's formal involvement in the program ended in 2019; however, the project is still ongoing. See <https://www.porh.psu.edu/oral-health/>, accessed December 7, 2022.

²⁶⁵ National Rural Health Association, *Compendium of Rural Oral Health Best Practices*, 2020.

²⁶⁶ These counties are Cameron, Carbon, Crawford, McKean, Potter, and Schuylkill.

²⁶⁷ PORH staff involved with the program expressed to us that children were made the focus of the MORE Care collaborative because of the additional emphasis placed on oral healthcare for this age group. In addition, the program was seen as a way to introduce children to oral healthcare at an early age, thus hopefully destigmatizing the professional for these individuals later in life.

²⁶⁸ DOH supports bi-directional referrals between medical and dental offices in its 2030 Oral Health Plan. See DOH, *Pennsylvania Oral Health Plan, 2020-2030*, 2020.

²⁶⁹ PORH staff informed us that at times insurance companies have been reluctant to reimburse for fluoride treatments and other dental services performed at the RHCs. The RHCs have also experienced recruitment and other workforce issues when staffing dental assistants, which have only been exacerbated by the COVID-19 pandemic. In addition, the pandemic forced the clinics to explore other options to administer care - including mobile dentistry and teledentistry - which were met with mixed success.

basic dental services into single clinic visits.²⁷⁰ The number of clinics involved in the program has continued to grow since 2016, and now Pennsylvania has more participating facilities than any other state in the collaborative.²⁷¹

Moving forward, the integration of primary and oral healthcare may play a critical role in the outlook for dental services in rural Pennsylvania. Not only can this integration potentially improve individual health outcomes and reduce system costs in the long term, but it can help to expand and streamline dental services access to rural communities by including oral healthcare treatment when patients seek care for other issues. Even outside of formal initiatives aimed at increasing integration, continuing to promote the concept of “whole-person health” – especially related to oral healthcare – can help make inroads among patients in rural areas that may have previously been dissuaded from seeking dental care due to accessibility issues.²⁷²

Innovative Strategies from Other States

In the final discussion of this issue area, we will highlight several innovative strategies from other states that have been implemented to reduce disparities in oral healthcare in rural communities. This discussion is not exhaustive, as states with considerable rural populations have looked to address this issue in many unique ways. The strategies included below were identified based on their relation to other topic areas in this report and our judgement of the applicability of these initiatives within the current oral healthcare landscape in Pennsylvania. Moving forward, we encourage the General Assembly and oral health stakeholders to consider all policy options aimed at improving dental services access in rural Pennsylvania.

Pathways Model. Started in the early 2010s, the Regional Oral Health Pathway program was designed to help address the oral healthcare needs of uninsured and underinsured populations in rural western Maryland. The program was a private-public partnership that implemented a pathways model, which primarily used community health workers (CHWs)²⁷³ to connect patients with neglected oral healthcare

²⁷⁰ Since the collaborative has experienced several different administrative entities and data collection platforms since PORH’s formal involvement ended in 2019, it was difficult to obtain complete data on the program. However, PORH reported to us that over the last four years, 10,500 patients across four clinics in Crawford, McKean, and Schuylkill Counties were treated with dental equipment purchased as part of a HRSA-funded project.

²⁷¹ See <https://www.carequest.org/how-we-work/health-improvement-programs/more-care>, accessed December 7, 2022.

²⁷² DOH has stated increasing oral disease screenings, risk assessments, preventative treatments, and referrals from primary care providers is a strategic goal in its 2030 Oral Health Plan. See DOH, *Pennsylvania Oral Health Plan, 2020-2030*, 2020.

²⁷³ DOH promotes the use of CHWs in underserved communities in its 2030 Oral Health Plan. See DOH, *Pennsylvania Oral Health Plan, 2020-2030*, 2020.

needs to necessary resources.²⁷⁴ Like the integration of primary and oral healthcare discussion above, CHWs in this program were trained on basic dental health concepts. The CHWs then used this training to educate patients on the importance of oral health.²⁷⁵ Primary care providers within the health network that conducted this program were trained on how to perform oral healthcare screenings as well. In addition, the program used federal grant funding to help recruit dental providers to offer services for low-income patients at greatly reduced rates. As the program evolved, services expanded outside of western Maryland into West Virginia and Pennsylvania's Bedford County.²⁷⁶

The Regional Oral Health Pathway program is one of the few oral health initiatives reviewed by HRSA's Rural Health Information Hub that has been labeled with "evidence-level" (meaning data driven) effectiveness. Throughout the observation and data collection period (2011-2015), the program cited a reduction of dental treatment costs of 80 percent. In addition, the program provided nearly 5,000 urgent dental treatment visits to at-risk patients, which equated to over \$3 million worth of care. As a result, the program reduced dental related emergency department visits by 16 percent.²⁷⁷

Tooth decay is one of the most common chronic childhood diseases in the United States.

Oral Health in Educational Settings. Tooth decay is one of the most common chronic childhood diseases in the United States and can have many other health and societal impacts on young children.²⁷⁸ CMS sets a minimum threshold for dental care for children under the age of 21 that states must offer as part of their Medicaid programs.²⁷⁹ However, stakeholders expressed concern over the declining emphasis of oral health in rural educational settings. Specifically, a decline of school-based dental hygienists.²⁸⁰ This trend is likely the result of larger trends within the dental support workforce, which were discussed above.

The "Smiles Ahead" initiative in Louisiana has looked to address similar issues in rural areas over the last decade. The program used federal grant funding to create a network of partners among local dental providers and Federally Qualified Health Centers (FQHCs). The point of access for children to receive care was through school-based health centers

²⁷⁴ See <https://www.ruralhealthinfo.org/project-examples/815>, accessed December 21, 2022.

²⁷⁵ See <https://www.ruralhealthinfo.org/rural-monitor/chw-oral-health/>, accessed December 21, 2022.

²⁷⁶ See <https://www.ruralhealthinfo.org/project-examples/815>, accessed December 21, 2022.

²⁷⁷ Ibid.

²⁷⁸ See <https://www.cdc.gov/oralhealth/basics/childrens-oral-health/index.html>, accessed December 21, 2022.

²⁷⁹ See <https://www.medicaid.gov/medicaid/benefits/early-and-periodic-screening-diagnostic-and-treatment/index.html>, accessed October 24, 2022.

²⁸⁰ According to PCOH, there were only 28 school districts with school hygienists in the 2021-22 academic year.

(SBHCs).²⁸¹ Practitioners at these rural SBHCs provided oral health assessments and fluoride varnishes as part of their normal evaluations of students and made referrals to local dentists when needed. In addition, the SBHCs acted as the "dental homes" for students, allowing for the continuity of care over time. Between 2015 and 2018, the program cited the completion of over 6,000 oral health assessments, 5,000 fluoride varnishes, and 2,300 dental referrals.²⁸²

Currently there are 33 SBHCs in Pennsylvania.²⁸³ Although these centers are predominantly in non-rural areas, SBHCs have started to expand outside of major metropolitan areas, as clinics have been established in Franklin and Perry Counties.²⁸⁴ In addition, DOH's 2030 Oral Health Plan places an emphasis on increasing the number of preventative dental services offered to children and plans to replicate best practice models for school-based programs.²⁸⁵ While establishing the local networks required to expand SBHCs to rural areas of the commonwealth will take time, this could be an area where mobile dentistry and teledentistry could serve as inroads to oral healthcare in the school setting in the short-term.

²⁸¹ SBHCs are clinics – typically operated by local health professionals – that provide a variety of healthcare services to children within the school setting. See <https://kidshealth.org/en/parents/school-based-health.html>, accessed December 21, 2022.

²⁸² See <https://www.ruralhealthinfo.org/project-examples/861>, accessed December 21, 2022.

²⁸³ See <https://www.psbha.org/our-work>, accessed December 21, 2022.

²⁸⁴ See https://www.google.com/maps/d/viewer?mid=1VnJf4RUN0jkeb8EFwlQuVjYEiZeht_k&ll=39.92839420000004%2C-77.6515235&z=8, accessed December 21, 2022.

²⁸⁵ DOH, *Pennsylvania Oral Health Plan, 2020-2030*, 2020.

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Appendix A – House Resolution 68 of 2021

PRINTER'S NO. 691

THE GENERAL ASSEMBLY OF PENNSYLVANIA

HOUSE RESOLUTION

No. 68 Session of
2021

INTRODUCED BY RAPP, OWLETT, ZIMMERMAN, GAYDOS, CONKLIN, PICKETT,
HILL-EVANS, WEBSTER, WHEELAND AND STAMBAUGH, MARCH 1, 2021

REFERRED TO COMMITTEE ON HEALTH, MARCH 1, 2021

A RESOLUTION

1 Directing the Legislative Budget and Finance Committee to
2 conduct a study to review the availability of dental services
3 in rural areas of this Commonwealth and to provide a report
4 detailing the options for improving access to oral health
5 care services.

6 WHEREAS, Lack of oral health care services leads to a greater
7 risk of chronic illnesses and poor health outcomes; and

8 WHEREAS, Teledentistry can be practiced in many ways,

9 including video consultations, provider education courses and
10 patient monitoring to address a patient's oral health; and

11 WHEREAS, Teledentistry is practiced in 23 states, with most
12 of those states allowing Medicaid agencies to authorize
13 reimbursement for teledentistry services; and

14 WHEREAS, Preventive dental care and treatment reduces
15 expenditures to treat other chronic and serious conditions; a

16 WHEREAS, Mobile dentistry has become a valuable tool in
17 delivering oral health care services to rural Pennsylvania
18 and

19 WHEREAS, Many Pennsylvanians, including residents enrolled in

1 medical assistance, living in rural areas or experiencing
2 disabilities, are frequently unable to find or see a dentist or
3 pay for dental care; and

4 WHEREAS, Increasing the availability and lowering the cost of
5 oral health care services is vital to meet the oral health
6 demands of residents of this Commonwealth who live in rural
7 areas; and

8 WHEREAS, At least 40 state Medicaid programs reimburse for
9 mobile dental services; therefore be it

10 RESOLVED, That the House of Representatives direct the
11 Legislative Budget and Finance Committee to conduct a study to
12 review the availability of dental services in rural areas of
13 this Commonwealth and to provide a report detailing the options
14 for improving access to oral health care services; and

15 RESOLVED, That the Legislative Budget and Finance Committee's
16 report include an examination of the costs of oral health care
17 services for residents of this Commonwealth who live in rural
18 areas and lack access to oral health care services; and be it
19 further

20 RESOLVED, That the Legislative Budget and Finance Committee's
21 report include recommendations to present options for how
22 teledentistry and mobile dentistry could expand access to oral
23 health care services for residents of this Commonwealth who live
24 in rural areas; and be it further

25 RESOLVED, That the Legislative Budget and Finance Committee
26 submit its report to the members of the House of Representatives
27 within 18 months of the adoption of this resolution.

Appendix B – ADA Dentist Database Masterfile County Profiles, 2019

County	Rural or Non-Rural	DHPSA or Non-DHPSA	Total Number of Dentists	Total Number of Dentists (FTE Adjusted)	Population-to-Dentist (FTE)	Average Dentist Age in 2022	Active in Medicaid (FTE Adjusted)	Accepting New Medicaid Patients (FTE Adjusted)	Affiliated with an FQHC (FTE Adjusted)	Affiliated with a DSO (FTE Adjusted)
Philadelphia	Non-Rural	Non-DHPSA	1120	1061.4	1,493:1	46	404.5	399.0	178.9	78.1
Allegheny	Non-Rural	Non-DHPSA	1016	973.5	1,249:1	54	547.4	535.9	34.0	101.3
Montgomery	Non-Rural	Non-DHPSA	846	793.7	1,046:1	52	254.0	249.0	48.1	68.6
Bucks	Non-Rural	Non-DHPSA	500	465.2	1,351:1	54	138.6	136.6	21.1	24.1
Delaware	Non-Rural	Non-DHPSA	428	402.2	1,408:1	55	126.2	125.7	25.2	20.9
Chester	Non-Rural	Non-DHPSA	347	330.7	1,588:1	53	88.7	82.2	14.6	23.6
Lancaster	Non-Rural	Non-DHPSA	262	251.4	2,170:1	52	93.4	93.4	17.8	12.2
Lehigh	Non-Rural	Non-DHPSA	235	217.5	1,698:1	51	80.9	78.9	12.2	13.5
Westmoreland	Non-Rural	Non-DHPSA	216	201.7	1,730:1	57	100.9	100.4	5.3	19.2
York	Non-Rural	Non-DHPSA	203	194.3	2,312:1	51	74.8	70.8	14.5	6.7
Dauphin	Non-Rural	Non-DHPSA	179	167.8	1,660:1	53	71.4	70.4	13.3	8.5
Northampton	Non-Rural	Non-DHPSA	179	166.0	1,840:1	52	73.2	71.2	3.5	11.0
Cumberland	Non-Rural	Non-DHPSA	176	166.8	1,517:1	51	56.0	55.0	7.5	14.5
Berks	Non-Rural	Non-DHPSA	173	163.9	2,565:1	52	65.6	65.6	6.3	11.8
Luzerne	Non-Rural	DHPSA	160	155.5	2,041:1	55	74.5	73.5	5.5	6.0
Lackawanna	Non-Rural	DHPSA	156	151.2	1,388:1	54	88.0	88.0	10.0	0.0
Erie	Non-Rural	DHPSA	151	145.2	1,856:1	54	74.7	70.7	7.5	4.1
Butler	Non-Rural	Non-DHPSA	142	125.9	1,496:1	52	57.4	54.4	3.0	15.2
Washington	Non-Rural	Non-DHPSA	127	115.4	1,793:1	56	52.9	51.4	5.0	6.8
Beaver	Non-Rural	Non-DHPSA	81	68.6	2,391:1	57	37.6	36.6	5.7	9.0
Centre	Non-Rural	DHPSA	78	74.3	2,181:1	54	24.3	22.3	3.0	2.0
Fayette	Non-Rural	DHPSA	64	60.1	2,154:1	56	29.6	29.1	3.0	1.5
Cambria	Non-Rural	DHPSA	63	59.5	2,187:1	59	41.0	40.0	0.0	2.0
Monroe	Non-Rural	Non-DHPSA	63	58.5	2,906:1	54	25.1	25.1	5.0	8.8
Lebanon	Non-Rural	Non-DHPSA	60	54.0	2,617:1	54	15.5	15.0	5.5	1.0

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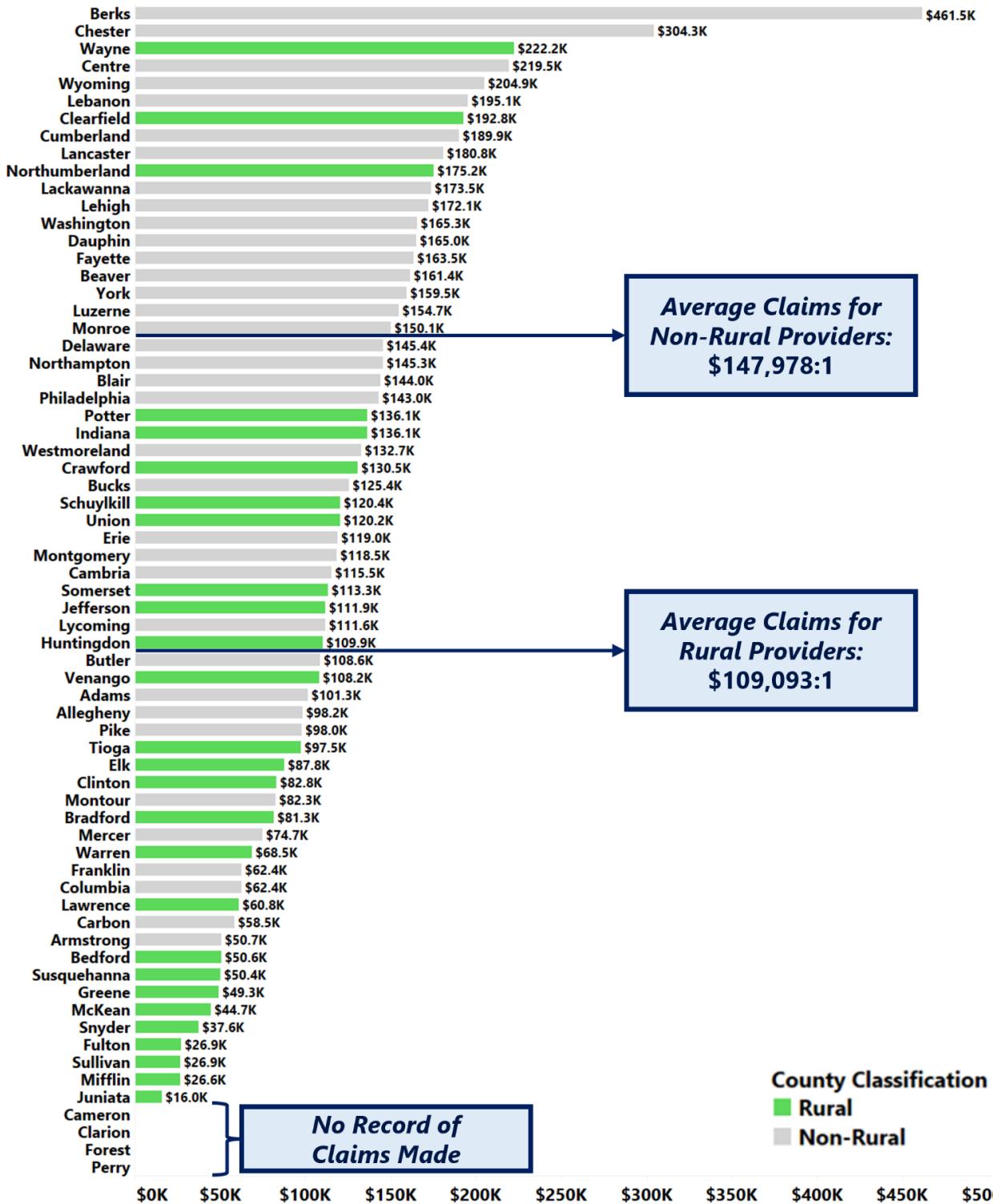
County	Rural or Non-Rural	DHPSA or Non-DHPSA	Total Number of Dentists	Total Number of Dentists (FTE Adjusted)	Population-to-Dentist (FTE)	Average Dentist Age in 2022	Active in Medicaid (FTE Adjusted)	Accepting New Medicaid Patients (FTE Adjusted)	Affiliated with an FQHC (FTE Adjusted)	Affiliated with a DSO (FTE Adjusted)
Blair	Non-Rural	DHPSA	55	51.5	2,368:1	53	25.5	23.5	0.0	0.0
Franklin	Non-Rural	Non-DHPSA	54	53.0	2,934:1	49	32.0	29.0	7.0	7.0
Lycoming	Non-Rural	DHPSA	52	47.7	2,383:1	56	16.5	15.5	5.0	3.0
Mercer	Non-Rural	Non-DHPSA	50	47.3	2,313:1	56	16.8	15.8	7.0	2.0
Schuylkill	Rural	DHPSA	49	45.8	3,080:1	51	27.7	27.7	1.2	1.0
Lawrence	Rural	DHPSA	40	34.3	2,490:1	57	13.3	13.3	3.3	1.9
Clearfield	Rural	DHPSA	35	30.1	2,632:1	52	18.5	18.5	1.3	0.5
Crawford	Rural	DHPSA	32	27.5	3,070:1	55	18.0	15.0	2.0	0.0
Union	Rural	Non-DHPSA	30	28.5	1,561:1	52	10.5	10.5	0.0	0.0
Columbia	Non-Rural	DHPSA	28	27.5	2,364:1	55	16.5	13.5	0.0	0.0
Northumberland	Rural	DHPSA	27	26.0	3,488:1	56	13.0	13.0	1.0	0.0
Adams	Non-Rural	Non-DHPSA	25	23.3	4,405:1	54	10.0	10.0	2.0	0.3
Indiana	Rural	DHPSA	25	23.2	3,627:1	52	13.7	13.7	2.0	1.5
Carbon	Non-Rural	DHPSA	24	19.0	3,375:1	53	5.3	5.3	0.0	0.0
Montour	Non-Rural	DHPSA	24	21.5	846:1	44	11.0	10.0	2.0	0.0
Bradford	Rural	DHPSA	23	22.2	2,722:1	46	7.2	5.2	2.0	0.0
Somerset	Rural	DHPSA	22	21.3	3,443:1	56	12.3	12.3	0.0	2.0
Wayne	Rural	DHPSA	22	20.5	2,501:1	51	10.5	10.5	5.5	1.0
Armstrong	Non-Rural	DHPSA	20	15.3	4,233:1	59	10.3	10.3	0.0	1.0
Bedford	Rural	DHPSA	19	18.0	2,662:1	47	12.0	11.0	2.0	0.0
Pike	Non-Rural	Non-DHPSA	19	17.3	3,221:1	55	7.0	7.0	2.0	0.0
Jefferson	Rural	DHPSA	14	12.8	3,374:1	58	7.5	6.5	1.0	0.0
Venango	Rural	DHPSA	14	13.0	3,913:1	58	7.0	6.0	1.0	1.0
Warren	Rural	DHPSA	14	13.0	3,013:1	54	6.0	6.0	2.0	0.0
Clinton	Rural	DHPSA	13	11.5	3,331:1	56	7.5	7.5	1.5	0.5
Greene	Rural	Non-DHPSA	13	11.8	3,047:1	56	7.0	7.0	3.0	0.0
McKean	Rural	DHPSA	13	11.9	3,414:1	54	4.0	4.0	2.0	0.0
Snyder	Rural	DHPSA	13	12.0	3,366:1	55	4.5	3.5	1.0	0.0
Clarion	Rural	DHPSA	12	10.3	3,726:1	53	4.0	4.0	1.3	0.0
Elk	Rural	DHPSA	12	10.3	2,893:1	53	5.8	5.8	2.0	0.0
Mifflin	Rural	DHPSA	12	10.3	4,460:1	52	4.3	4.3	1.3	0.0
Huntingdon	Rural	DHPSA	11	11.0	4,081:1	55	4.0	4.0	0.0	0.0
Tioga	Rural	DHPSA	10	10.0	4,067:1	52	3.0	2.0	0.0	0.0
Perry	Non-Rural	Non-DHPSA	9	9.0	5,147:1	61	3.0	3.0	1.0	0.0
Susquehanna	Rural	DHPSA	7	7.0	5,749:1	60	5.0	5.0	0.0	0.0

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County	Rural or Non-Rural	DHPSA or Non-DHPSA	Total Number of Dentists	Total Number of Dentists (FTE Adjusted)	Population-to-Dentist (FTE)	Average Dentist Age in 2022	Active in Medicaid (FTE Adjusted)	Accepting New Medicaid Patients (FTE Adjusted)	Affiliated with an FQHC (FTE Adjusted)	Affiliated with a DSO (FTE Adjusted)
Wyoming	Non-Rural	DHPSA	7	7.0	3,827:1	61	2.0	2.0	1.0	0.0
Potter	Rural	DHPSA	4	3.6	4,596:1	47	2.0	2.0	1.0	0.0
Fulton	Rural	DHPSA	3	2.5	5,801:1	46	1.5	1.5	0.0	0.0
Juniata	Rural	DHPSA	3	3.0	8,253:1	64	1.0	1.0	0.0	0.0
Sullivan	Rural	DHPSA	3	3.0	1,986:1	66	3.0	3.0	0.0	0.0
Cameron	Rural	DHPSA	1	1.0	4,425:1	34	0.0	0.0	0.0	0.0
Forest	Rural	DHPSA	1	0.5	14,060:1	66	0.0	0.0	0.0	0.0

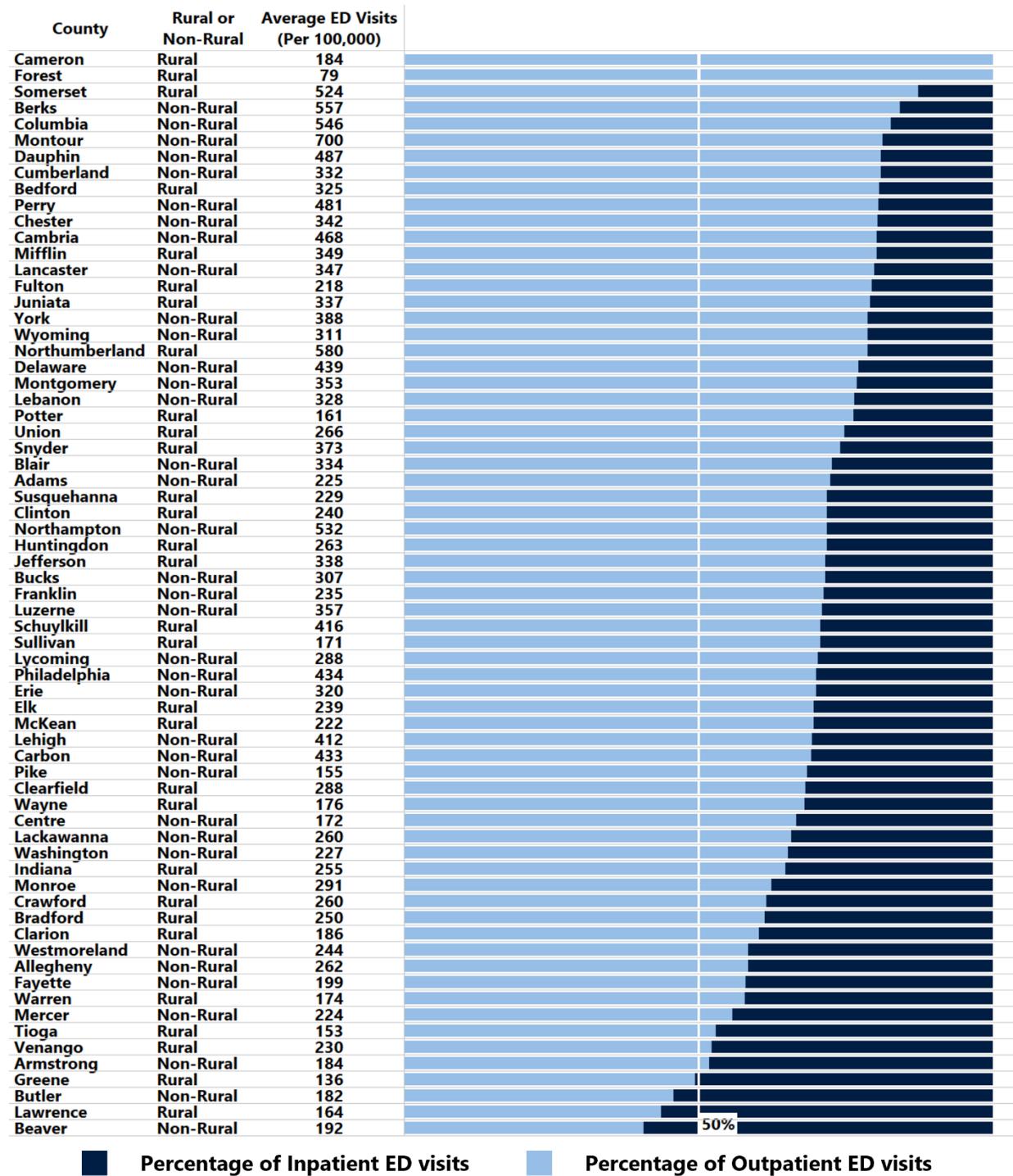
Source: Developed by LBFC staff from information provided by the ADA.

Appendix C – Meaningful Medicaid Provider Claims Per MA Dentist by County



Source: Developed by LBFC staff from information provided by the ADA.

Appendix D – Average Dental-Related Emergency Department Visits by County, 2018-2021



Source: Developed by LBFC staff from information provided by the ADA.

