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AN EXPLORATORY LOOK INTO THE EFFECTS OF MISSISSIPPI'S POPULATION DECLINE ON
RURAL DENTAL CARE

By
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A thesis submitted to the faculty of The University of Mississippi in partial fulfillment of the
requirements of the Sally McDonnell Barksdale Honors College.

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ABSTRACT

Literature reviews and interviews with dentists working in rural Mississippi counties examined the effects of population decline on rural dental care in Mississippi. With the state's continual population decline, loss of industry follows a loss of people. Through a cascade of effects, this can further reduce underserved areas' access to dental care. In order to address the issue of rural Mississippi continuing to be underserved, policies need to be implemented that will make rural practice at least enticing if not desirable.

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Introduction

Rural Americans appreciate strong ties with their local community. They value life, family, and jobs (Harvard 2018). However, there are concerns for the future of rural communities in regards to financial problems, health care, drug addiction, and declining local economies. Amid these issues, residents still feel attachment to their communities due to relationships with neighbors, life in a small town, and being around good people (Harvard 2018). Still, these areas are being increasingly forgotten as migrants move to a more urban settlement system and shift away from farming (Johnson 2019). In the past, rural population decline due to urban growth and sprawl was offset by natural increase, the difference between births and deaths. Today, rural counties are at a total population decline; population loss is the new normal across vast regions of rural America (Johnson 2019).

More than half of Mississippi's population is considered rural. Of Mississippi's 2,961,279 residents, 1,569,926 live in rural areas, making up 53% of the total population (USDA-ERS). Rural meltdown is described as the 'hollowing out' of rural areas, or losing educated young people at the same time agricultural and industry changes affects the landscape for those who stay (Carr & Kefalas 2009). Because of this concept, young people should now be considered the most prized commodity in rural America. The exodus of youth leaves rural communities to resemble ghost towns (Carr & Kefalas 2009). When considering the migration of rural residents, placing emphasis on healthcare professionals is important because the health of the community is at stake.

With Mississippi being one of three states to show a population decline in the 2020 census, hitting rural counties the hardest, it is worth examining the relationship between population loss and the availability of dental care to residents of rural Mississippi counties. Understanding the reasons for dentists choosing or not choosing to work in rural areas is essential to remove barriers to rural practice. It is also critical to understand the potential impact of reduced access to dental care on overall population health as a means of advocating effectively for policy incentives to promote rural practice.

Literature Review

While admiring the qualities that rural living offers its residents, rural residents also have concerns for the economic future of their communities. Citizens of rural communities state a significant number of young people have left for job opportunities elsewhere and about half of rural Americans rate their economy as fair or poor (Harvard 2018). The rural ‘brain drain’ is the phenomenon of rural areas losing talented young people at the same time that there are changes in farming and industry. In order to further examine the migration of rural Americans, researchers in Iowa categorized rural residents in groups of working class ‘stayers’, college bound ‘achievers’, military joining ‘seekers’, ‘returners’ and professional ‘high fliers’ (Carr & Kefalas 2009). The additional education needed to become a healthcare professional would put them in the achievers and high fliers category, which are both marked as being people who do not return to their rural roots.

Rural to urban migration isn’t a new occurrence, but at this point in the 21st century, the consequences are more severe now than ever (Carr & Kefalas 2009). “A new birth simply cannot replace the loss that results when a college-educated twenty-something on the verge of becoming a worker, taxpayer, homeowner, or parent leaves” (Carr & Kefalas 2009). In addition to impacts on population and industry, it is important to consider how healthcare in rural America is impacted by these changes as well.

Population Changes in Mississippi

Mississippi lies in the southeastern part of the United States and covers 46,907 square miles. The state is unique in that a majority of its population lives rurally. The 2020 U.S. Census showed that Mississippi’s population decreased by 6,018 since 2010 (USDA-ERS). This decline makes the state one of three to see a decline in the 2020 census, alongside Illinois and West Virginia. Though Mississippi’s was the smallest decline of the three and less than 1% of the overall population, some rural counties lost up to a fourth of their residents (USDA-ERS). Simultaneously, urban counties showed significant growth up to almost 18%. Below, table one shows five Mississippi counties that experienced the greatest decline

in population, all of them being rural (USDA-ERS). Table two shows the four counties that experienced the most growth, all of them being urban. Rural-Urban Continuum Codes (RUC), shown in the 6th column from the left, are a form of classification that differentiates between metropolitan counties and nonmetropolitan counties. An RUC code of 1-3 is classified as a metro county, whether by population or by proximity to a larger metro area, with 1 being the most metro. RUC codes 4-9 signify non-metro counties, with 9 being the least metro and most rural. With table 1 having RUC codes ranging from 6-8 and table 2 ranging from 1-4, it is indicative that rural counties are on the far end of the spectrum, suffering the greatest decline, while urban counties are on the opposite end, seeing serious growth.

Table 1: Rural Counties Showing Significant Decline

County Name	2010 Population	2020 Population	Overall Change	Percent Change	RUC Code	Poverty % (2019 USDA ERS)
Quitman County	8,223	6,176	-2,047	-24.89%	6	35
Sharkey County	4,916	3,800	-1,116	-22.70%	8	33
Coahoma County	26,151	21,390	-4,761	-18.21%	7	38
Tallahatchie County	15,378	12,715	-2,663	-17.32%	7	38
Humphreys County	9,375	7,785	-1,590	-16.96%	6	37
Mississippi	2,967,297	2,961,279	-6,018	-0.20%		19

Table 2: Urban Counties Showing Significant Growth

County Name	2010 Population	2020 Population	Overall Change	Percent Change	RUC Code	Poverty % (2019 USDA ERS)
Lafayette County	47,351	55,813	8,462	17.87%	4	18
Lamar County	55,658	64,222	8,564	15.39%	3	16
DeSoto County	161,252	185,314	24,062	14.92%	1	9
Madison County	95,203	109,145	13,942	14.64%	2	10

Additionally, rural Mississippi had an average poverty rate of 22.5% (2019) while urban Mississippi was at 16.1% (USDA-ERS). 11 of the 13 counties with the highest poverty rates are located in the Mississippi delta: Coahoma, Tallahatchie, Humphreys, Bolivar, Yazoo, Issaquena, Leflore, Quitman, Sunflower, Washington, and Sharkey. Of the aforementioned counties, poverty rates range from 38.2% (Coahoma) to 33.4% (Sharkey) (shown in Table 1) (USDA-ERS). Of the top 15 counties with the highest poverty rate, all but Yazoo are RUC coded as non-metro, mostly 7+ (USDA-ERS). Essentially, a large portion of the Mississippi delta is classified on the far end of non-metro and has some of the state's highest poverty rates.

Conversely, the northern neighboring state of Tennessee has continually attracted newcomers with more than 500,000 people moving to the state between 2010-2020. Migration trends mirrored the nation's as metropolitan areas grew while rural communities shrank; much of the metropolitan growth was centered in areas surrounding Nashville (Yu 2021).

Moreover, in the same time frame that Mississippi suffered an overall population loss, the population of the South increased. Since the 2010 census, populations in southern and western regions of the United States demonstrated rapid growth. The South led the charge, having 10 of the top 15 fastest growing cities with a population greater than 50,000. Populations of large southern cities increased by an average of 11.8% (Census Bureau 2020). Essentially, Mississippi's overall population trends are unique in comparison to neighboring states and the general South.

Existing literature indicates citizens of rural communities are less likely to visit the dentist, have greater oral health needs, and face significant oral health disparities (Chandel 2022). Since most of Mississippi is rural, and these areas suffered significant population loss, the question of how they felt the effects of this change especially in regards to healthcare is important.

Rural Dentistry Challenges

The inverse care law can be defined as people who need care the most not being able to receive it. In the case of rural health care- "people in rural communities have poorer health and greater needs for

primary healthcare, yet they are not as well served and have more difficulties accessing healthcare services than people in urban centers” (Ford, Donald 2016). Mortality and morbidity differences between urban and rural residences are well researched. This concept is referred to as the “rural mortality penalty” (Richman 2019). Rural communities are more subject to preventable conditions such as obesity, diabetes, and injury and are more likely to engage in risky behavior such as substance use and smoking. They demonstrate lower levels of physical activity and lower nutrition diets that are more calorically dense. In short, rural residents are at an increased risk of poor health outcomes whether it be due to physical environment, socioeconomic states, or additional social factors (Richman 2019).

Many research articles address challenges pertaining to physician and hospital shortages in rural areas but less of them address challenges within dental care in rural communities. There is almost no existing research specifically pertaining to the state of Mississippi. Therefore, this paper will explore the challenges of dental care in rural Mississippi. The broader literature outlines three key barriers to rural dental practice: (1) smaller population sizes; (2) aging dental workforce; and (3) insurance bottlenecks.

1. Population Size

The United States Bureau of Labor Statistics shows great discrepancies nationally in average dentist salaries for metro versus non-metro areas. The highest paying metropolitan areas show salaries between \$276,510 - \$220,070 while the highest paying nonmetropolitan areas range from \$160,210 - \$163,920 (US BLS). Mississippi’s annual mean wage sits at \$161,700, lower than those of Arkansas, Tennessee, and Alabama (US BLS). As the population in rural communities declines, they might not provide a thriving market for dental businesses. This could result in rural areas appearing disinticing for the dental workforce.

2. Limited Supply of an Aging Dental Workforce

The American Dental Association, (ADA), Masterfile holds the most up-to-date information on dentists, both practicing and non-practicing, in the United States. According to the most recent data (2016), in the United States, there were 196,441 dentists when the population was 323,127,513, making for a national dentist per 100,000 residents rate of 60.79 (American Dental Association). The ten states

with the highest dentists per 100,000 population ratio have numbers ranging from 88.52-71.56.

Mississippi was cited as having 42.19 dentists per 100,000 citizens, making it the second lowest, barely above Arkansas' 41.16 but lower than Alabama's 43.69.

Mississippi has one dental school, The University of Mississippi Medical Center, that gives preference to in-state applicants and has not admitted any non-residents in the last few years (UMMC). The school can accept a maximum of 40 dental students in a class because it cannot accommodate more than 40 students in the simulation lab. Neighboring state schools such as the University of Tennessee Health Sciences Center and Louisiana State University accept 106 and 75 students per year, respectively (UTHSC, LSU). In 2018, the UMMC dean stated that the school was expected to graduate roughly 118 new dentists in the next 4 year period. This estimate does consider students who may choose to leave the state to practice. In the same 4 year period that the school is projected to generate 118 new dentists, projections indicated that 192 dentists would retire (Bowman 2018).

Many rural counties are faced with a shortage of healthcare professionals. Less available practitioners in an area results in limited access to dental care for citizens. Even for dentists that do operate in rural areas, the current workforce is aging and needing replacement. The aging dental workforce is a crucial but often overlooked barrier to dental accessibility in the United States. In 2016, an estimated 40% of US dentists were aged 55 or older compared with 27% in 2001 (Samsel 2021). When new graduates replace aging dentists, there is not much opportunity created for more practitioners to expand the amount of care available. "Most dental jobs result from the need to replace the large number of dentists projected to retire during the same period" (Williams, John M 2005). The ADA cites 17.3% of Mississippi dentists being between the ages 21-34, 34.5% being 35-49, 33.8% being 50-64, and 14.7% being 65 and above (ADA). In 2016, at the time of data collection, the average age of a practicing Mississippi dentist was 49.3 (ADA). Alabama shares similar concerns of underserved rural areas, aging dental workforce, and many medicaid patients. A 2021 study found two major issues in regards to rural dentistry that could be similarly applied to Mississippi, especially since the two states have similar dentists per 100,000 citizens ratio (42.19 & 43.69, respectively) (ADA). First, young people's access to

dentists was found to be higher in Alabama urban areas than rural areas (1.28 dentists per 1,000 young people vs. 0.85 dentists per 1,000 young people). Secondly, a dentist retirement simulation showed rural regions would be more affected by dentist retirements than urban areas (Samsel 2021).

3. Insurance Bottlenecks

In addition to an aging dental workforce, an additional problem impacting rural population pertains not only to the amount of dentists in rural areas, but especially the amount of dentists that participate in Medicaid. A study conducted in Illinois found that rural areas had substantially lower supply of dentists than their urban neighbors, and therefore a lower supply of dentists participating in Medicaid, despite the substantially higher Medicaid participation rate of citizens in rural areas than in the metropolitan areas. The most important factor, regardless of rural or urban status, was found to be the proportion of children enrolled in Medicaid and the participating dentist to population ratio (Byck 2002).

One question this paper will examine is the relationship between declining population in rural areas and access to dental health care providers. In addition, reasons that working in rural settings with small populations can be disinticing to practitioners will be examined.

Effects of Rural Oral Care challenges on the Population

The implications of lack of access to dental care on a population are serious. Many Americans generally have poor oral health, but the low-income population is even more at risk than the general population. People with low incomes are ten times more likely to have poor tooth and mouth health and twice as likely to report that the appearance of their teeth has affected their employment, particularly in job interviews (Zutic 2016). Particularly in regards to rural areas, lower socioeconomic and rural/remote communities are susceptible to the inaccessibility of health services and health inequality (Graham, Beene et al 2019). When a population is underserved, this often leads to lingering issues in community members that do not seek treatment. People with active untreated dental disease will miss more days from work and children will miss more days from school than persons with good dental health (Williams, John M 2005). In many studies, when participants are asked to self-report, they often mention they believe that the

appearance of their teeth has negatively impacted their employment status, particularly in job interviews.

In 2018, Mississippi scored a zero percent overall on Oral Health America's Wisdom Tooth Project that reports on the oral health status of those older than 65 (Bowman 2018). The report considered factors such as severe tooth loss, community water fluoridation, and Medicaid coverage data. The report concluded that 55% of senior adults in the state have severe tooth loss. (Bowman 2018).

Currently, there is not adequate research about the tangible effects of lack of access to dental care in rural Mississippi. This paper will investigate the specific effects on the population when left with limited resources for dental health care. Interviews will be conducted with practicing dentists particular to the Mississippi delta region in order to learn what they think are the most significant issues when a rural population is underserved. Dentists practicing in rural communities will be asked if they believe the overall oral health and hygiene of their patients has declined, stayed the same, or improved in the past decade.

Questions as influenced by the literature:

1. Are the causes of physician shortages similar to those of dental workforce shortages in rural communities?
2. What is the relationship between population size and access to dental care in rural Mississippi?
3. Why can working in a rural setting be disinticing to practitioners?
4. What is preventing people from locating and expanding rural dental care?
5. What are the effects of the limited access to dental care within rural communities?
6. What are the possible viable options for underserved rural Mississippi counties?

Methods

To better understand developing ideas, Ole Miss Library's Online One Search was used to find existing literature pertaining to lack of access to dental care in rural communities. Data from the United States Census Bureau was used to examine population trends in Mississippi.

To better assess the perceived effects of population decline on the dental workforce and their respective communities, other deterrents, and possible solutions, qualitative interviews were conducted with dentists who practice in rural Mississippi. In acquiring participants for the interviews, dentist offices were called and asked if they would like to assist in an undergraduate student's thesis work pertaining to dental care in rural Mississippi. Dentists were deemed eligible for the interview simply by being a practicing dentist in a rural community of Mississippi, practice ownership or length of years practicing were not considered in the initial recruiting. If the dentist participated, they were also asked if they knew of any peers who would also want to participate in order to try to recruit other dentists for interviews. There was one exception to this method, a dentist from Tennessee was interviewed in order to glean information of how other states are approaching the same dental workforce shortage issues present in Mississippi. This dentist was selected because of his publicly known role in working towards solutions for his state.

The interviews consisted of mostly open ended discussion questions, encouraging conversation and personal anecdotes from the participants. An interview script approved by the University of Mississippi Institutional Review Board was used to guide the interviews. The focal points of the interview questions were population changes in Mississippi, rural dental care challenges, trends in patient oral health status, personal reasons for practicing in a rural community. In order to assess possible solutions to access to care issues, interviewees were also asked questions pertaining to their thoughts on possible policy changes, changes in dental school curriculum, increased funding, or any other thoughts they deemed relevant in attracting practitioners to rural communities. These interviews took place over

phone, video conference, and email so that people from various towns could be reached with ease. The interviews were recorded and transcribed verbatim. Then, the transcripts were coded for common themes.

Results

Participant Demographics: Dentists in this sample have been practicing between 4-40years. The median years of practice being 17 and the average being 19.5.

Theme 1. Impacts of Population Decline

All Mississippi dentists interviewed articulated their concern that the counties they serve have experienced decline since they started practicing. Interviewees attributed population decline to a variety of factors: namely loss of industry and subsequent decrease in economic opportunities and exodus of youth from the communities, as well as lack of entertainment. As one doctor stated:

“So far as population in general, I would definitely say it’s declined. Even just in the short period that I’ve been here... We’ve definitely had a few key industries leave, which has definitely contributed to the population decrease. Most people are moving, which a lot of it is young people finishing school and going out of state. It’s totally understandable going and moving off, getting great jobs in Dallas or Birmingham or wherever else everybody is moving to these days. And then a lot of it is, I would say, middle class factory type workers that had jobs here and then their certain industry either downsized or shut down.” - Sam, 12.27.2021

As population decreases and people move out of rural areas in pursuit of more opportunity, the effects of this can be felt in the dental community. Interviewees who have been practicing for a longer period of time state that they believe the number of dentists in their area has declined since they began practicing.

“We first came back to Greenwood in the 80s, I came here in 82. There was a good bit of industry in Greenwood, and that was good because there were three, maybe four other

dentists that came in at the same time. ... because the population has dropped in Greenwood, the number of dentists has dropped and access can be a problem. And the number of dentists probably has something to do with that.” -Fred, 11.4.2021

While Mississippi continues its trend of decreasing population, the neighboring state of Tennessee has seen significant population increases; yet, Tennessee shares similar concerns around lack of dental providers in the state. In particular, the continuing migration of dentists to urban areas in the state, often abandoning rural counties.

*“Tennessee has like ninety five counties, you know, and if you look at the metropolitan areas Memphis, Nashville, Jackson, Chattanooga, and Knoxville up in the Kingsport area, they’re not doing that poorly and particularly middle Tennessee. And the reason middle tennessee is a booming place now, it’s like one of the **it** places people are moving to. Tennessee was one of the top states over the past two years where folks have been migrating to from the north and the west. They’ve been going to Texas, Florida, and Tennessee. And so we’ve actually increased our population over the last few years from about close to five million to over seven million. And we have not been producing any more dentists. You know, that’s the problem.” -Roy, 1.10.2022*

“When we started looking at this problem, we said, well how many dentists short are we in the state? And we took a very conservative estimate of approximately seven to eight hundred dentists short of what we need right now. You’ve probably seen the date out of ADA that you know, they recommend like sixty one dentists per 100,000 patients. And if you look at that, Tennessee is ranked something like number 43rd out of 50 depending on what poll you look for access to care. So, you know, we did the calculations on how many

dentists need to go out to reach those numbers that are optimum and so we're about seven or eight hundred short." -Roy, 1.10.2022

Theme 2. Clinic Level Deterrents

Financial Deterrents

Aside from losing population, industry, and opportunity, there are other factors at play that can make it difficult to attract dentists to come work in rural areas. When asked about the potential similarities or differences within physician and dentist shortages, the common business model of the two different careers was pointed to as potentially a reason for physicians having more incentive than dentists. Dentists, especially in rural areas, go for practice ownership, whether in part or in full, while few rural physicians have their own private practice; they typically work in a group practice or for a hospital. Hospitals have the corporate budget to provide the loan repayment for physician debt accumulated from medical school. There is also a rural physician program in Mississippi. There is a rural dental program, but it is not nearly as large as the rural physician program. Rural dentists who own their own practice, cannot incentivize others with loan repayment while physicians working for large groups or hospitals might have more of that opportunity.

"There is a rural dental program in Mississippi. However, it's not as big. And so there's very few, you know, there's very little incentive for a student, and I'm speaking strictly from Mississippi.. Very little incentive for someone who's not from a small, rural town to come back unless you have a family friend or a dentist that's retiring that has a great opportunity .. I think that's probably the biggest issue." - Sam, 12.27.2021

"Hospitals have big corporate budgets where they can reimburse students and that kind of thing to incentivize young doctors to come back and practice there. So whereas, if I'm by myself, I'm not going to say you can work for me then I'll give you all this money to

pay back your student loans. Whereas you know, physicians there, they have that bigger umbrella, so there's more of an incentive to do that.” - Sam, 12.27.2021

Patient Volume and Insurance

Rural practices also vary differently from practices in urban areas. Interviewees discuss how the population of their rural areas has pretty significant health issues, “that’s just Mississippi in general” so one would really need to be on their Ps and Qs, and “know their stuff.” In addition, with not having as many dentists in one area, one’s patient volume can be very high.

“It is more challenging because you have to know your stuff pretty well. Most of the population is going to have pretty significant health issues - that’s Mississippi in general... The volume of patients that we see is a lot different just simply because we have to treat more patients.” - Sam, 12.27.2021

With dental school graduates graduating dental school with such high debt, there can be financial deterrents in regards to working in a rural area. Dentists report that in order to practice in a rural area, one is almost required to accept medicaid patients because there is a significant population in their rural areas with medicaid insurance. With medicaid patients, the payout is not as high as private insurance, therefore the work can feel almost like ‘charity.’

“For most of the practice, it just becomes charity. I mean, all the Medicaid you’re doing is charity. And so you know, you get paid a lot for it, but it’s nothing near what you’re, you know, which are regular fees.” -Fred, 11.4.2021

“Those rural areas that have a few dentists, they are older and they’re going to be retiring probably in the next five years. And no one is really going to move there, most

likely because the students graduate with such high debt that they want to go to an urban area, go work for corporate or somewhere where they can start paying their debt down.”

-Roy, 1.10.2022

Theme 3. Community Level Deterrents

Dentists speak about other problems in regards to maintaining the oral health of their community outside of factors that can be attributed to the number of available practitioners. The root of the issue is that some people see dentistry as elective. They feel as if they do not have to get dental work done unless they have extra money, dentistry can be too expensive for a lot of people. Whenever a crisis occurs, such a recession or the COVID-19 pandemic, people are reluctant to come in and get dental work done.

“There was a really bad recession and people just stopped coming and the pandemic kind of did the same thing. Dentistry is selective for most people, in other words, they don't have to get it.” -Fred, 11.4.2021

“When you don't get out, you're not going to take care of your teeth if you don't have a reason to take care of your teeth.” - Sam, 12.27.2021

From a healthcare provider's view, dental work being put off has detrimental effects for patients because what starts off as a small issue becomes a larger and usually more expensive issue with time.

“When somebody gets a tooth extracted, even if you do it painlessly, you can say we really didn't have to do this if you had come to see me 6 months to a year ago.” - Sam, 12.27.2021

“In a lot of cases, what I might have had treatment planned as a small filling on some body is now a root canal.” - Sam, 12.27.2021

Another noted pattern within interviews centered around transportation issues. The dentists interviewed have no problems providing care but say that patient transportation and actually getting to the dentist office to receive care is an issue. In a rural area with a spread out landscape, patients may be 30 miles away from their closest dentist office in comparison to larger cities where dentist offices may be within walking distance. Some insurance policies, including Medicaid, are supposed to provide non-emergency transportation, but it is not always reliable and it appears to dentists that there is a lack of employees within the companies that are supposed to provide the transportation.

“The biggest issue I’ve seen in a rural area is transportation; this is the biggest obstacle they face. ... In even bigger cities like Jackson, I would think the transportation was easier for them to get versus here. We’ve only got a few drivers that actually work for the company that’s in charge of transporting the patients, and so I think that’s probably the biggest obstacle.” - Sam, 12.27.2021

Theme 4. Solutions

While rural practice can seem overwhelming without a multitude of nearby practitioners and specialists to reach out to for help, there are also many benefits that dentists enjoy. In rural communities, dentists feel as if they have more personal relationships with their patients. While large patient volume has been cited as potentially an issue, it is also seen as a benefit by some dentists.

“I do feel that dentists in rural communities have a better opportunity to have a busy, thriving practices than compared to my friends that work in big cities.” -Beth, 1.18.2022

“The benefit of being from a small community is that everybody knows everybody. I know 60% of my patients on a personal basis.” - Sam, 12.27.2021

In regards to practice ownership and insurance, dentists in rural areas feel as if they have more control over the treatment planning of their patients, what insurances they choose to work with, and sometimes better pay out due to limited options of other dentists.

“Compensation is actually more in smaller areas because there are fewer dentists for people to choose from and you do not have to be in network with dental insurances that dictate what your treatment plan for your patients and then pay you pennies for the work. It was my goal to own my own practice so I have full control over the treatment my patients receive. I don't feel that those opportunities are readily available in metropolitan areas. If you look in bigger cities there is a dentist office on every corner and most are corporate offices that have multiple offices that are all about production numbers and not centered around giving patients the best care possible.” -Beth, 1.18.2022

Since dentists see so many benefits of working in a rural area, they believe that exposure to rural practice would attract people to work in these areas.

Pertaining to the fact that rural areas have to work with Medicaid, a potential solution was brought up as increasing medicaid payouts for dentists in order to attract people to work in rural areas.

“When I was in dental school, there was the golden age of delegation and it came out that dentists in the Mississippi delta made more money than a lot of other dentists in the country because the Medicaid system was very lucrative and there was a lot of insurance. And so it gradually deteriorated as far as the reimbursements, so that's probably the main

thing if they can raise the Medicaid fees because basically you can't practice here without doing that and that's true in most rural areas. ... I hate to say a federal program but other than that, it's jobs, jobs and federal programs." -Fred, 11.4.2021

In Tennessee, after a group assessed the shortage of dentists across the state, possible solutions were considered. A bill was proposed to the governor in order to incentivize dental school graduates to work in rural areas. The main priorities of this proposal included increasing the class size of dental schools in Tennessee in order to educate more dentists every year, beef up existing clinical facilities across the state, and repay the loans of people who choose to work in the state clinics in an underserved area. Researchers point towards loan repayment as probably being the best way to make a difference in the rural counties the fastest.

"Number one, let's incentivize graduates to go to these areas. The amount we put in , the proposal was \$100,000 a year to pay toward the debt. So if a student graduates with a debt of say, \$250,000 - \$300,000 and then they go to one of these areas and work in a state dental clinic, they get paid the state salary which is somewhere between 125,000 and 150,000 plus benefits, plus \$100,000 to pay toward their loan amount.. And then after three years, the debt is paid off and the hope is that they would stay working there or they may set up a practice in their area. But if not, they go wherever they want to go and we backfill with another individual." -Roy, 1.10.2022

Seeing as all Mississippi dentists who were interviewed were from the rural area they returned to practice in or married someone from the area, it was also acknowledged that recruiting people to become dentists from the rural areas in need could prove to be a useful tactic in getting more dentists to the underserved rural areas. Tennessee recognizes this as a potentially beneficial strategy as well:

“The other thing that’s not in the proposal per say that I recall, but it’s something we’re going to do is we actually recruit dental students from these areas because we feel like if a student is from a particular county that is in need of a dentist, they just might go home and practice. Most likely they will, or at least, you know, might go back into the general area. ... When we’re out recruiting certain demographics of students, we’re looking at folks from rural communities, underserved communities. We can’t really rule out underserved communities.” -Roy, 1.10.2022

“I grew up here and I always knew I wanted to come back and practice here. I also married my wife who is from here; we both grew up together ... and her family is from here as well. So we always kind of knew this is where we wanted to be. ... Had I not been from here, probably no way I would have come to Indianola.” - Sam, 12.27.2021

“People come back here because it’s home, you know? And because they have a job. But when I was in the Navy for three years, my wife and I, we couldn’t wait to get back to Mississippi. If it wasn’t my hometown I don’t know if I would want to go.” - Sam, 12.27.2021

“I am originally from the delta- I grew up in Greenville. I think that influenced my decision to return to the delta too. My husband is a farmer in the delta, so this place means a lot to us.” -Beth, 1.18.2022

Discussion

Rural Dental Practice During Population Decline

Those currently in rural dental practice recognize the rural population decline in Mississippi. Dentists who have been in practice over a few decades clearly connect population loss and the loss of dental practitioners. They note personal experiences of coming to their small towns decades ago when there was more industry, and that now with a decline in population and industry, the number of dentists has subsequently dropped. Dentists new to practice also recognize the exodus of youth and population loss. However, due to only practicing for 4-5 years, they are not able to definitively say whether they believe the decrease of population in their rural communities has resulted in a decline in the number of practicing dentists.

It is interesting to note that even states that have had an increase in population also share the struggle of having a dental professional shortage, but not as a result of population decline or lack of industry. In Tennessee, despite population growth, the number of dentists graduating from dental school each year has not changed. This has resulted in a shortage of roughly 700-800 dentists after the state's population had increased by roughly 500,000 over the past decade. Dental graduates tend to congregate towards the Nashville area, following the immigration trends of new Tennessee residents. This trend leaves rural areas in need of more practitioners.

Facilitators & Barriers to Rural Practice

Every dentist interviewed working in a rural area was either from the town or married to someone from that same town. Very much in agreement with the literature, analyses in this study demonstrated the importance of being from a rural area in choosing to return to a rural area. When considering the exodus of youth from rural areas, interviewees noted that even people with jobs outside of dentistry typically return if they have a job in place or family in the area.

In addition to dentists returning to the area that they themselves or their spouse originate from,

there are some benefits to rural practice interviewees point towards as being inviting for rural practice. Dentists working in rural areas feel as if they have more personal relationships with their patients, oftentimes knowing them outside of a doctor-patient relationship. In dentistry, there are two typical business routes. There are corporate offices, typically found in larger cities, or practitioner owned practices. Dentists in rural areas speak about having a choice for what insurances they choose to work with, so they can choose insurances that allow the dentist to have control over the treatment planning for the patient and compensate well for services. They do not believe these same opportunities are as easily accessible for dentists in metropolitan areas, because there are many more dentists available compared to rural areas that may be more focused on production numbers. While not having as many dentists in a rural town can be viewed as a problem, practice owners believe it allows them to have busy and thriving practices.

Conversely, there are reasons as to why rural practice may appear uninviting. While being one of a few dentists areas can lead to high patient volume (and compensation), Mississippians have significant health issues. In order to best treat their patients, dentists need to be extremely competent and comfortable in their skills to handle a high patient volume in addition to severe health issues. Tooth loss is linked to all-cause mortality, cardiovascular disease mortality, and reductions in quality of life (Dorfer 2017). The elderly population of Mississippi has a higher rate of severe tooth loss than anywhere else in the country. A 2018 report found that 55% of adults in Mississippi over the age of 65 have lost at least six teeth and only 52% had seen a dentist in the previous twelve months (Campbell 2018). Periodontitis, also known as gum disease, is a chronic inflammatory disease. When left untreated, it can lead to progressive loss of tooth supporting structures and eventually tooth loss. Over recent decades, periodontitis has been linked to higher mortality and increased risk of numerous non-communicable diseases, (NCDs), such as diabetes mellitus, cardiovascular disease, and chronic renal disease. Tooth loss is also a predictor for cardiovascular mortality (Dorfer 2017).

In addition, rural areas tend to have a high population with Medicaid insurance. In order to

practice in a rural area, one is almost required to accept Medicaid insurance. With the payout for Medicaid insurance not being as high as private insurance, the work can almost feel like “charity.” The 2018 report that ranked Mississippi highest for elderly tooth loss, *The State of Decay*, also ranks states by how many procedures the state Medicaid policy would reimburse. Mississippi came close to last in this ranking due to only tooth extractions and oral examinations being the only two reimbursed procedures (Campbell 2018).

Impact of Limited Access on Community Health

The literature points to health issues being worse for citizens of rural areas, such as tooth and severe tooth loss. Dentists interviewed feel as if Mississippi residents in general have significant health issues but it is inconclusive if the availability of dentists is the causation of poor oral health in underserved areas when there are other factors to consider such as transportation and insurance.

A surprising issue brought up by dentists practicing in rural Mississippi as being a deterrent to getting rural citizens to the dentist is transportation. Dentists note that being able to perform needed services to patients is not an issue, however patients have issues having access to transportation to the appointment. While some insurances are supposed to cover transportation to and from appointments, there are not many drivers employed by the companies used for transportation. In a rural landscape, patients could be thirty plus miles from their dentist, with public transportation and walking not an option, not having access to transportation for an appointment is a deterrent to getting to the dentist.

While this study initially sought to understand the potential impact on rural communities as a result of limited access to dental care, the COVID-19 pandemic provided a more salient set of global concerns. With respect to the impact on dental care in rural spaces, rural dentists spoke more of how global crises such as the COVID-19 pandemic and recessions seriously affected community health. In circumstances that may affect one's income, dental visits are often seen as elective and put on hold. Many dentists point toward a patient coming earlier about a problem they are having as being detrimental for treatment. A minor that could have been treated simply in the past can turn into a more

expensive and painful procedure if left untreated.

Recommendations

1. Expose Students to Rural Practice Early. There are a multitude of viable solutions for increasing dental access in rural Mississippi areas. Rural dentists are able to spell out the benefits of rural practice such as knowing their patients on a personal level, high patient volume, and control over what insurances they will network with and treatment planning. Therefore, they note that if dental students were exposed to rural practice and its benefits, it could potentially attract more students to rural practice.
2. Increasing Medicaid payouts for services would also increase the benefits of rural practice, seeing as it is almost necessary to accept Medicaid in order to truly serve rural populations.
3. Support local students in their aspirations for rural healthcare generally, and dentistry specifically. Additionally, recruit more students from rural areas to dental school or to encourage younger students to consider careers in dental education.
4. It is no secret that dental school is expensive. Incentivizing students with loan repayments if they choose to work in a rural area could prove to be an extremely effective retention strategy. Tennessee recognizes that they are roughly 700-800 dentists short in order to meet the state's needs. There is currently legislation being proposed that would offer students \$100,000/year loan repayment if they will work in an underserved area. The hope is that graduates will be able to pay their debt down and potentially stay working in a rural area. If not, when they leave the position would hopefully be backfilled. Tennessee's proposal also wants to increase the class size of the state's dental schools, in order to graduate a higher number of dental students per year and work towards closing the gap.

Implications

1. A major takeaway is that the effects of the continuing population decline in Mississippi are felt everywhere, especially within the dental workforce. Dentists reflect on times when what they believed was a good amount of industry was followed by an immigration of dentists. As they observe the current migration of youth and industry alike in search of better opportunity, rural living seems to be enticing only to people with rural roots. It begs the question that if the population continues to decline, will underserved areas struggle even more? This should be a point of concern for the state's elected officials. There are solutions available, as exemplified by some neighboring states.
2. While Mississippi has a rural dental program, it is not nearly as large as the rural physician nor is it as comprehensive as other programs in the country. State politicians should glean from the ideas of others, such as increasing dental school class size and offering loan repayment programs for those who choose to work in rural areas. With Mississippi's last reported average dentist age being 49.3 and the state's singular dental school only graduating a maximum of 40 dental students per year, it is crucial to quickly implement policies that would have the biggest effect.
3. In addition to attracting dental students to rural areas, there are other deterrents that could be addressed in order to improve dental care for rural citizens. Amping up medicaid payouts in order to entice rural dentists to see more medicaid patients could result in more rural citizens being able to go to the dentist. Additionally, increasing employment opportunities at transportation agencies could result in rural patients better being able to get to their dental appointments. With dentists pointing toward prevention as key for avoiding much bigger and more serious health issues, getting patients to dental visits as often as necessary is crucial in maintaining oral health.

With the continual population decline in Mississippi, loss of industry follows a loss of people.

Through a cascade of effects, this can further reduce underserved areas' access to dental care. In order to address the issue of rural Mississippi continuing to be underserved, policies need to be implemented that will make rural practice at least enticing if not desirable.

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