Covered, but Not Cared For:

Identifying Pediatric Healthcare Deserts in Alabama and Interventions to Affect Change

November 2019

VOICES FOR ALABAMA'S CHILDREN

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introduction

COVERED, BUT NOT CARED FOR:

The number of uninsured young Alabamians is at a historic low, and that number is continuing to decrease every single year. This is reflected in the extraordinary 96.5% of children covered by some sort of health insurance in the state. But covered and cared for are two very different things, especially in rural Alabama. This white paper will examine the data and determine which counties have the greatest need for pediatric practitioners in several subspecialties, where possible. It will then explore a variety of possible options to help address pediatric healthcare deserts in Alabama, from more systemic barriers to barriers of geographic access.

Access to public health venues like hospitals and clinics is on the decline in rural Alabama, a designator that includes 55 of the state's 67 counties (Alabama Rural Health Association). This problem is compounded even more as we see the number of services at existing hospitals continue to decline. A clear example of this downward trend of access and service is the plummeting number of hospitals offering obstetrical services across the state.

executive summary

Our Issues are Fixable

As noted, Pediatric healthcare access is a serious issue in Alabama. Geographic barriers increasingly separate children from the facilities and practitioners they need to live healthy and happy lives. The data highlights shown hereafter indicate the most pressing issues concerning access across primary care, mental health, and dental care, and examine possible solutions to address them.

VOICES FOR ALABAMA'S CHILDREN

PRIMARY CARE ACCESS:

There are geographic trends, related to overall child well-being, in primary care access. Greene county, ranked 65th out of 67 counties for child well-being in the *2018 Alabama Kids Count Data Book,* has the direst need in the state. The need for primary care for children is underscored by data from the Alabama Board of Medical Examiners. 2018 data found that there were 1,401 pediatric or family medicine practices in the state, meant to serve the estimated 1,222,105 children aged birth to 19. That means, on average, each practice should be responsible for the healthcare of 873 kids. The lack of access to care is compounded by the fact that 272,139 children aged 9-18 are on Medicaid this year. This Medicaid subset represents 22.27% of the total child population in the state. That means that every family practice in the state would be responsible for 195 kids on Medicaid between the ages of 9 and 18. From the HPSA map, it's abundantly clear that there are geographic disparities in healthcare access for children. But the data on family practice and the Medicaid population sample show a distinct income based need as well.

MENTAL HEALTHCARE ACCESS:

Mental healthcare access shows a similar geographic trend to primary care access. Dallas, Perry, and Wilcox counties all tied for counties with the most need for mental healthcare practitioners. These counties were also ranked 66th, 62nd, and 67th respectively in child well-being in the *2018 Alabama Kids Count Data Book.* The six counties tied for next most-in-need were Fayette, Lamar, Mobile, Walker, Washington, and Winston. Of these counties, only Mobile has a city of 50,000+ within its limits. The concentration of mental health providers in cities is reinforced by data available on the website of Alabama's Department of Mental Health. Of the 67 counties, only two counties have more than one Mental Health provider listed, besides the state wide agencies; Jefferson and St. Clair. National data again highlights the desperate need for mental healthcare practitioners in the state. According to 2017 data pulled from the Centers for Medicare and Medicaid Services and published by Robert Woods Johnson's County Health Rankings website shows that Alabama has 13 counties with a population to provider ratio of 10,000: 1. This data shows a serious urban concentration of practitioners, in comparison to the significant need of rural Alabama.

DENTAL HEALTHCARE ACCESS:

Mapping of dental healthcare access reiterates that the lowest performing counties on the child well-being scale in the *2018 Alabama Kids Count Data Book* are also in the direst need for dental healthcare providers: Dallas, Hale, Greene, Monroe, Perry, and Wilcox counties all tied for the greatest in need and scored 66th, 55th, 65th, 58th, 62nd, and 67th on the Alabama Kids Count child well-being ranking. Of the 67 counties in Alabama, 21 have a population to provider ratio of over 5,000: 1. Geographic inequality really comes into clearer focus when looking at pediatric dental specialists. Based on the most recent data, there are 101 pediatric dentists in the state of Alabama. However, over 1/3 of these dentists is registered to practice in Jefferson County. In total, there are nine counties with more than one pediatric dentist registered to practice there. These nine counties, however, account for 97 of the 101 pediatric dentists in the state. This urban concentration of providers, and the overall lack of providers in rural Alabama is a consistent narrative across primary care, mental healthcare, and again in dental care.

Executive Summary: Recommendations and Next Steps

MEDICAL HOME

First described almost 30 years ago, the Medical Home is an organizing principle designed to ensure that primary care is holistic, family-centered, and coordinated. Primary care Medical Homes provide preventive care, chronic care management, care coordination and access in some form all day, every day, and have been proven highly effective.

SCHOOL-BASED HEALTH CENTERS

Research shows that school-based health centers can have a significant and positive impact on all facets of children's medical lives. In addressing the needs of disadvantaged children and students, the introduction and expansion of school-based health centers greatly increases students' access to effective care. Expanding the existing school-based health center programs in Alabama would serve as a significant step forward in addressing the needs of underserved students, rural and urban, across the state.

RURAL MEDICAL TRAINING PROGRAMS

One of the largest barriers to adequate medical care for children and adults in rural areas is distance from a provider. Programs exposing medical students to practice in underserved areas consistently create more rural doctors, and equally as important, retain them in those same underserverd areas. By reducing the disparity between rural and urban concentrations of physicians, people outside of major cities will be more likely to have access to quality care.

FINANCIAL INCENTIVES FOR PRACTITIONERS IN UNDERSERVED AREAS

A significant factor in retaining practitioners in underserved areas is financial incentives to offset the costs of medical school. Like mid-education exposure training in underserved areas, financial incentives for practice in underserved communities is one of the few intervention recommendations involving a direct redistribution of human resources to targeted areas.

EXPANDED SCOPE OF WORK FOR ALLIED HEALTH PROFESSIONALS

By increasing the scope of work for allied health professionals, a reasonable implication is access to health services would increase significantly, especially for underserved populations, such as children living in poverty, or children living in rural areas. But equally as important is the implication that the expansion of the scope of work for these professionals can increase efficiency and billings for private practice as well.

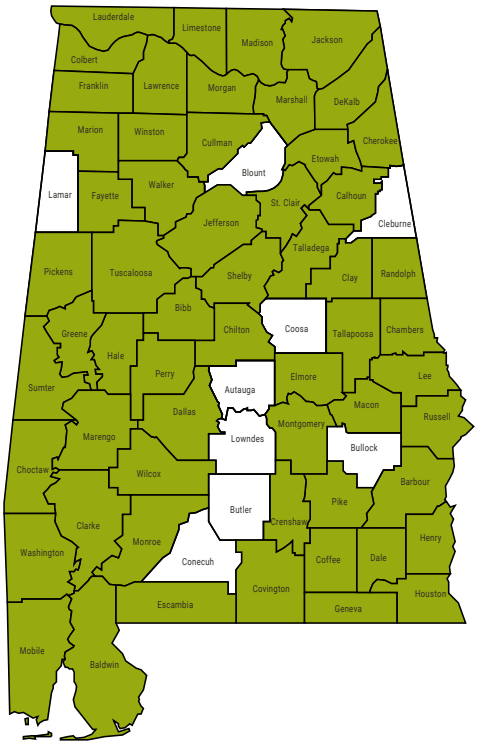
TELEMEDICINE

Telemedicine has been touted as one of the greatest examples of progress in the mission to expand access to medical services in rural and underserved areas. While there are many issues with implementing these services, especially in rural Alabama, the results of these interventions in other areas around the country and around the world have significantly reduced barriers and increased access to care.

A Picture of the Loss of Rural Obstetrical Service in Alabama since 1980

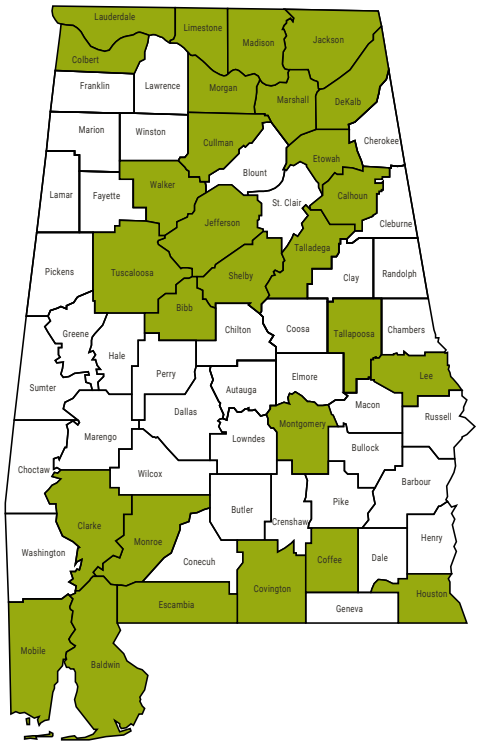
Obstetrical Service in Alabama

Alabama 1980



45 of the 54 counties currently considered **RURAL** had hospitals providing obstetrical service in **1980**

Alabama March 2016

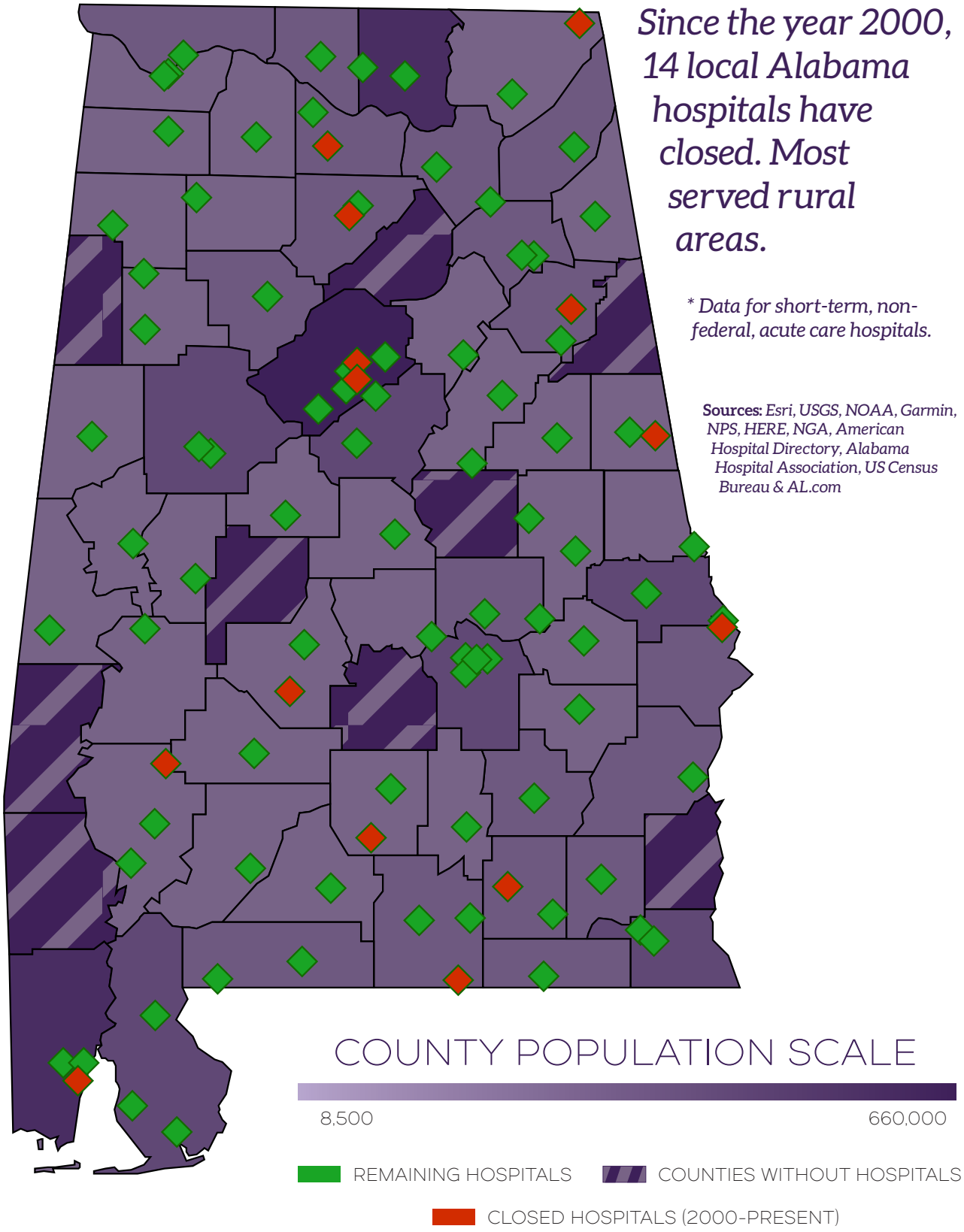


16 of the 54 counties currently considered **RURAL** have hospitals providing obstetrical service **TODAY**

Counties With Hospitals Providing Obstetrics

Produced by the Alabama Department of Public Health, Office of Primary Care and Rural Health and the Alabama Rural Health Association, March 15, 2016. The defining of counties as being rural or urban is based upon a definition that is used for study purposes by these agencies.

Alabama Hospital Closing and Shortages



Since the year 2000, 14 local Alabama hospitals have closed. Most served rural areas.

** Data for short-term, non-federal, acute care hospitals.*

Sources: *Esri, USGS, NOAA, Garmin, NPS, HERE, NGA, American Hospital Directory, Alabama Hospital Association, US Census Bureau & AL.com*

definitions & visual aids

Definitions & Visual Aids:
Discussing Pediatric Healthcare Deserts and Health Provider Shortage Areas

For the purpose of this article, it is important to note what we are referring to when we use the term *Pediatric Healthcare Deserts*. It is a blanket term used to identify areas that are underserved by pediatric professionals. The vast majority of mental and dental healthcare professionals who perform clinical care on children are not subspecialists in pediatric mental and dental healthcare. Therefore, the term *Pediatric Healthcare Deserts* can be confusing at first glance.

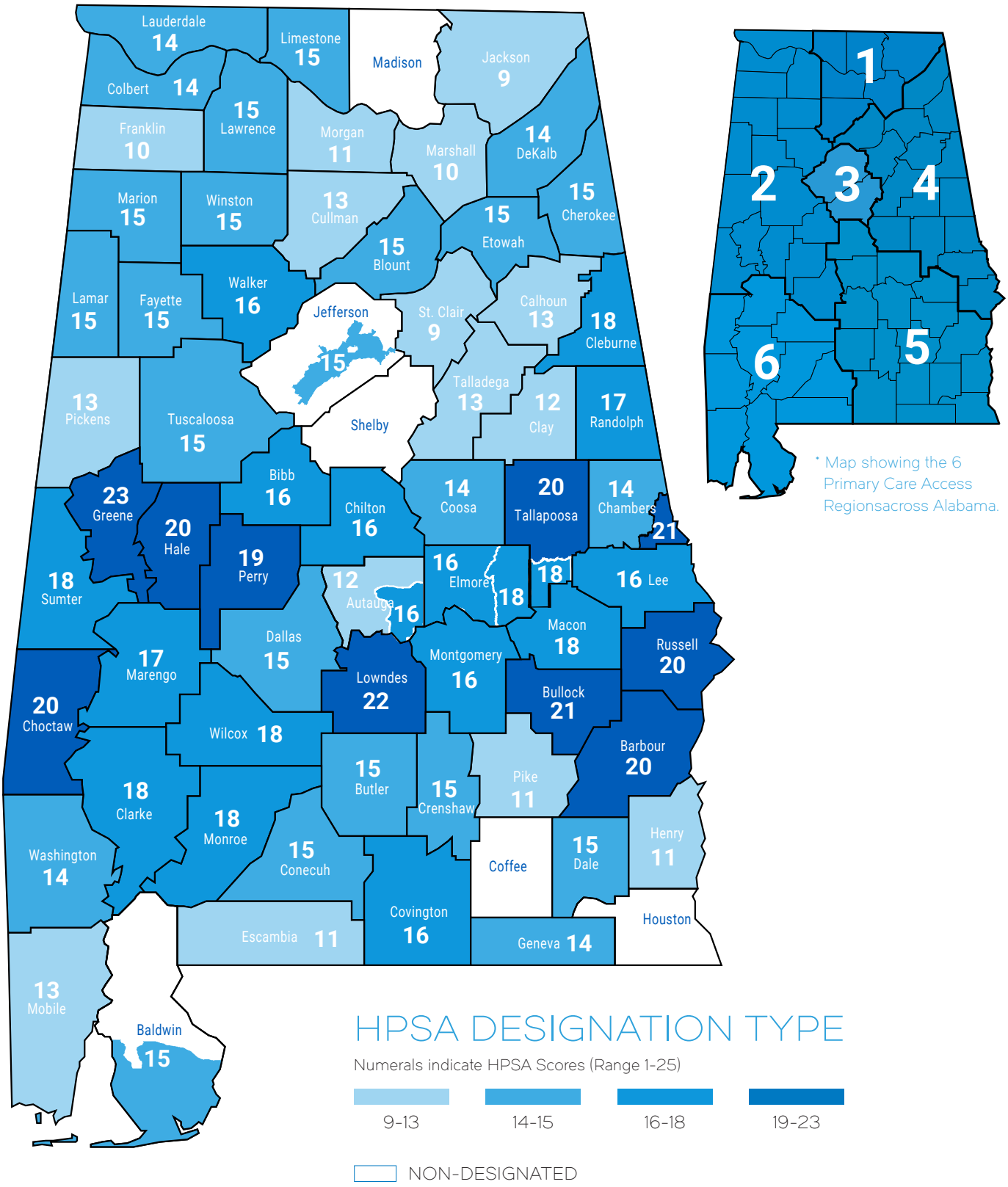
Throughout the paper, a variety of visual aids will provide context to the increasing healthcare disparities across the state. Three of the most significant maps are the most current Health Provider Shortage Area (HPSA) maps available at publication. HPSA maps are inter- and intra-county breakdowns that show either geographic or income based barriers to healthcare, broken down into three major subgroups: Primary Care, Mental, and Dental.

HPSA maps are developed using a strict scoring method published by the United States Health Resources and Services Administration. Primary Care and Mental HPSAs are scored on a 1-25 point scale, and Dental HPSAs are scored on a 1-26 point scale. In both cases, a score of 1 indicates no or almost no needs, whereas a score of 25 or 26 indicates the most extreme need.

Where possible, these visual aids have been augmented by additional research and measures to create a more accurate picture of the pediatric healthcare landscape across the state.

Additional data has been sourced where available from experts in the field and in the state. The data on Primary Care Access has been sourced primarily from the Alabama Department of Public Health. The data for Mental Health Access and Dental Access has been sourced from Robert Woods Johnson's County Health Rankings website, data collected in 2017 and 2016, respectively, from the Centers for Medicare and Medicaid National Provider Identifier registry.

Primary Care Health Professional Shortage Areas: January 2019



ISSUE 1

PRIMARY CARE ACCESS

The first Health Professional Shortage Area Map addresses Primary Care. Availability of primary care is a good overall indicator of the general health disenfranchisement of a particular county or locality within a specific county. According to the HPSA scale, Greene County has the most critical need for health professionals, with a score of 23 points on the 25 point scale. Lowndes County is second, with 22 points out of 25, and Bullock County, as well as parts of Chambers County on the Lee County and Georgia border, are tied for third most in-need with a 21 points out of 25 score. Notably, the only counties with scores of 19 or above on the Primary Care HPSA scale are south of the Birmingham metropolitan area.

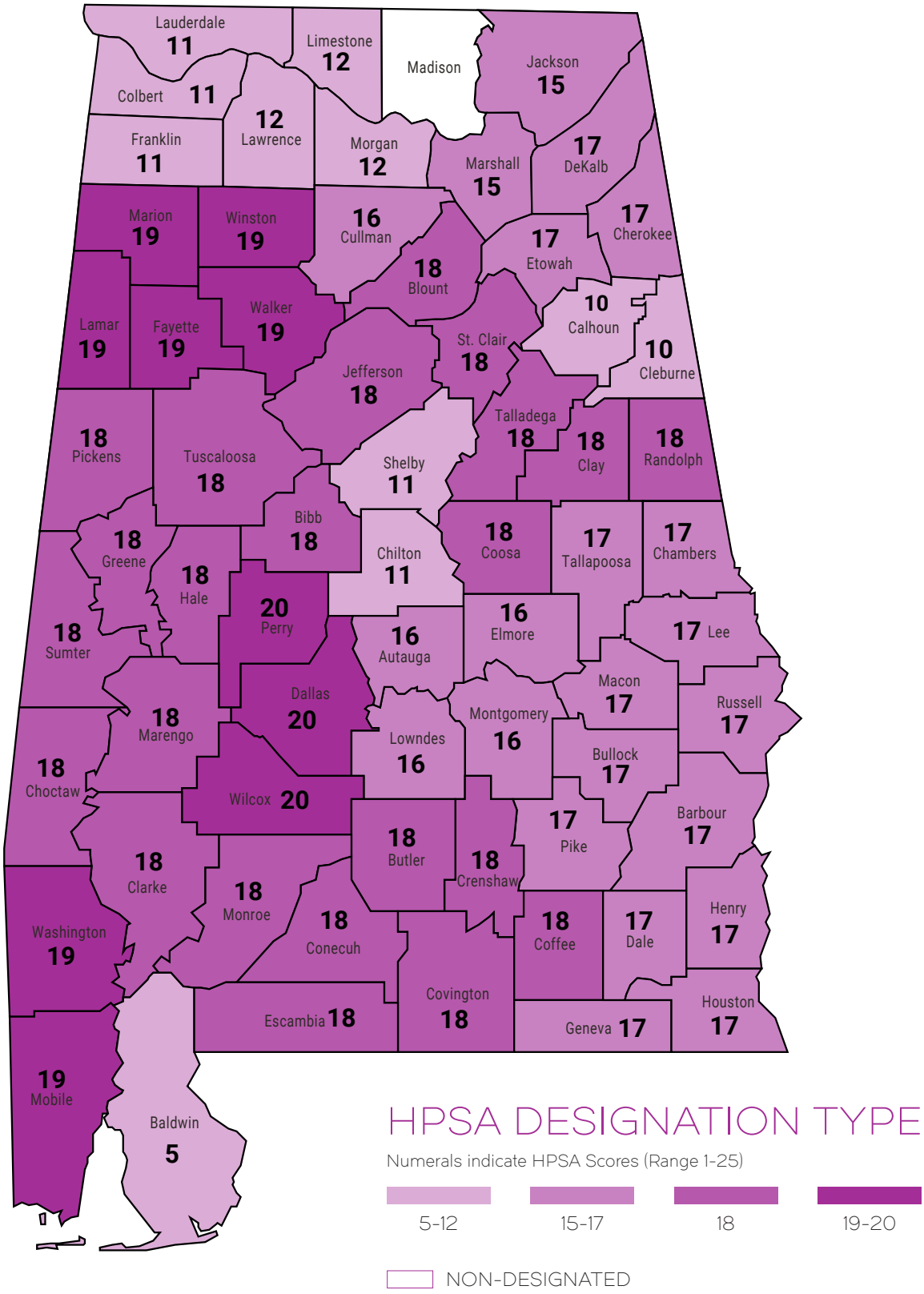
2018 Data from the Alabama Board of Medical Examiners indicates that there are 1,401 pediatric or family medicine (family practice, emergency medicine, or general practice, combined) practices in the state of Alabama. These 1,401 practices are responsible for caring for an estimated 1,222,105 children. As of 2018, the number of children between the ages of 9 and 18 in the state receiving Medicaid is 272,139.

These 272,139 children receiving Medicaid in this age range represents 22.27% of the total child population in the state. The statistical significance of this number demonstrates income, as well as geography, may represent a significant barrier to care for a large proportion of children in Alabama.

Data provided after initial publication by Children's of Alabama complicates the picture of pediatric access to healthcare. Measuring Pediatric Primary Care Providers only, the data indicates that there are 157 practices in the state. These practices are divided among 6 regions; Region 3 (the Greater Birmingham Area) having the most practices, with 41, and Region 2 (the Greater Tuscaloosa Area) having the least practices, with 16.

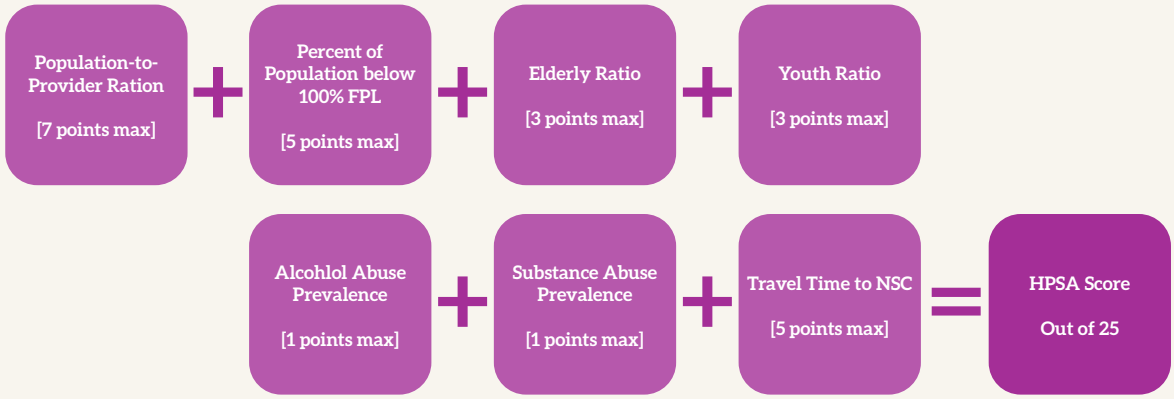
Additional data from Children's indicates that, for the most part, Alabama's CHIP recipient children are highly competitive in measures of health access and outcomes compared to their peers across the country, landing above the median, and well within the top quartile of a number of measures. Medicaid children not enrolled in CHIP, however, struggled in these metrics. These measures range from number of well-child visits across a variety of age ranges, access to primary care physicians, and mental health follow up visits.

Mental Health Professional Shortage Areas: August 2018



ISSUE 2

MENTAL HEALTHCARE ACCESS



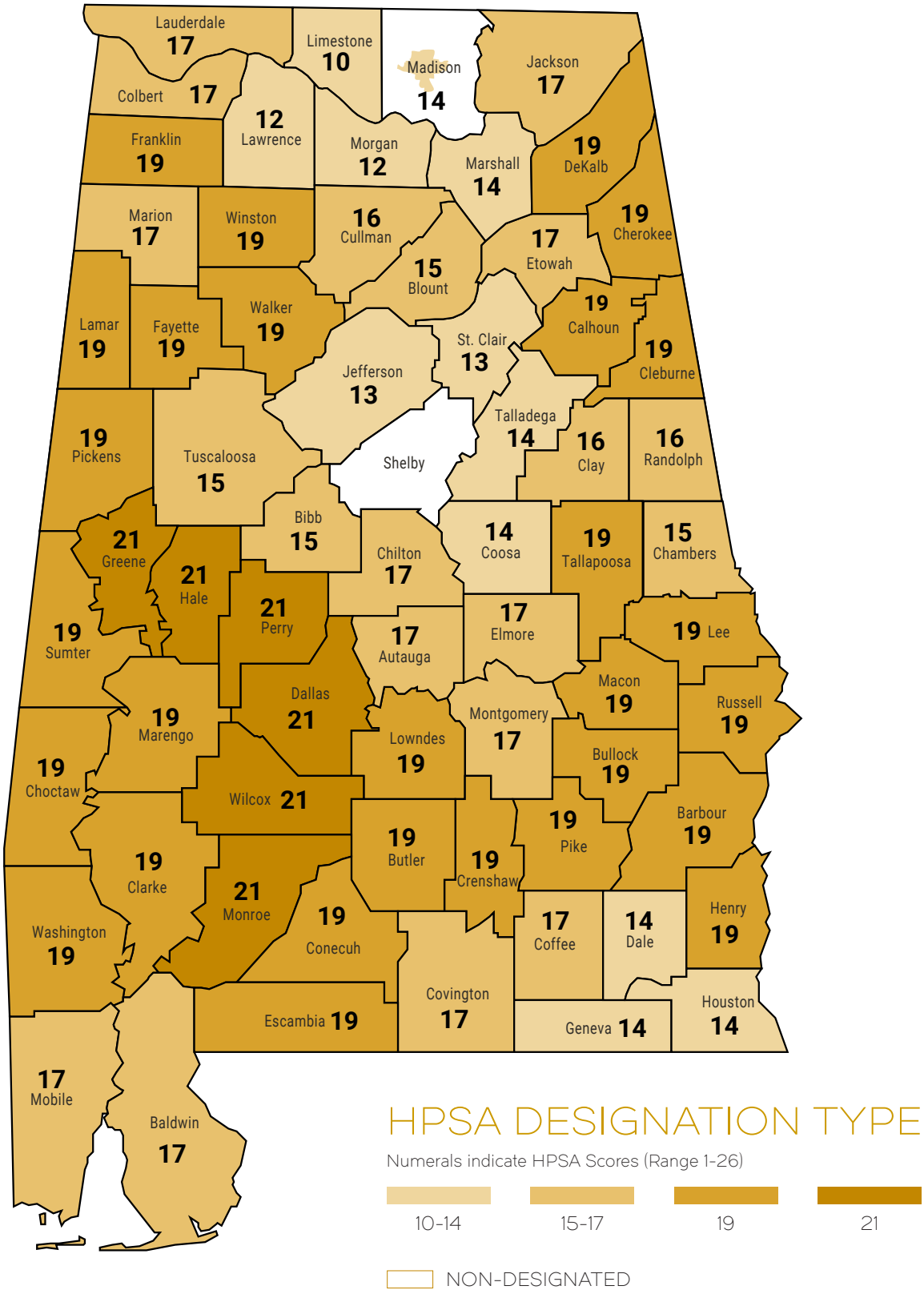
The Mental HPSA paints a slightly different picture of the disparity of care. The general geographic trend shows that distance from a larger city or metropolitan area often has a more direct relationship to HPSA score. Perry, Dallas, and Wilcox counties have the greatest need in the state, all scoring 20 points out of the possible 25 on the Mental HPSA scale. Of the seven counties scoring a 19: Winston, Walker, Fayette, Lamar, Marion, Washington, and Mobile, only Mobile county has a major city within its limits.

When we look at the provider to population ratio, the data shows a slightly different reflection of the care available. In data sourced in 2017 from the Centers for Medicare and Medicaid Services' National Provider Identification Registry, Robert Woods Johnson's County Health Rankings show that Alabama has 13 counties with a provider ratio of 10,000: 1. This is taken from a sample of 65, rather than 67 counties; two counties, Choctaw and Lowndes, have no data.

The Alabama Department of Mental Health provides online lists of mental health providers by county, as well as several state-wide providers. Of the 67 counties in Alabama, only two have more than one community provider beyond the statewide organizations: Jefferson and St. Clair. Jefferson County has eight providers, St. Clair has two (Alabama Department of Mental Health). This once again shows the urban concentration of mental healthcare providers.

Children's of Alabama provides additional data about the distribution of Mental Health Professionals across the state. As can be expected, the top performing counties, as measured by the Psychiatric Intake Response Center (PIRC) at Children's, are Jefferson, Madison, Mobile, Montgomery, and Shelby counties. These counties are host to some of the largest and densest populations in the state of Alabama. However, most of the counties in the state are struggling with the number of Mental Health Providers they have. The bottom 21 counties in the state all have 2 or less Mental Health Providers, including Coosa County, which has no Mental Health Providers whatsoever. This reinforces the inequitable distribution of quality care, geographically, across the state.

Dental Health Professional Shortage Areas: August 2018



HPSA DESIGNATION TYPE

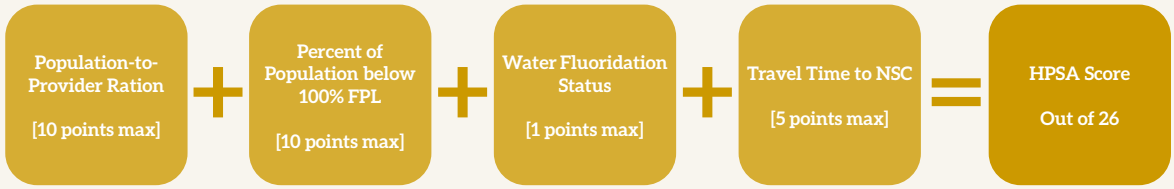
Numerals indicate HPSA Scores (Range 1-26)

10-14 | 15-17 | 19 | 21

NON-DESIGNATED

ISSUE 3

DENTAL HEALTHCARE ACCESS



The Dental HPSA is the only map that scores on a 26 point scale, contrasting the 25 point scales of both Primary Care and Mental. Additionally, in Alabama, this map is only disaggregated by income barrier, not geographic barrier to care. Six counties are tied for the greatest need: Greene, Hale, Perry, Dallas, Wilcox, and Monroe counties all scored a 21 out of 26 points. Twenty-eight out of the 67 counties in the state scored 19 points on the 26 point scale.

However, when we look at the provider to population ratio again, the data shows a troubling lack of providers in significant portions of the state. In data sourced from the 2016 Centers for Medicare and Medicaid Services' National Provider Identification Registry, County Health Rankings shows that Alabama has 21 counties with a provider ratio of 5,000: 1. This data taken from a sample of 66, rather than 67 counties, as Coosa County has no data.

When looking at pediatric dental specialists, however, the true inequalities of statewide care emerge. There are 101 pediatric dentists in the state, and over a third of these specialists are registered in Jefferson County. There are a total of nine counties with more than one pediatric dentist. These counties account for 97 of the 101 total pediatric dentists, leaving four specialists to address the needs of the rest of the state's 58 counties.

approaches to access

The data discussed so far has highlighted healthcare deserts and the issues surrounding access to pediatric care around the state, especially in its rural communities. Whether the barrier to healthcare is geographic or income-based, there are ways legislators and interested stakeholders can take positive steps to improve healthcare access and outcomes for all of Alabama's children.

MEDICAL HOME AS HOLISTIC CARE

First described almost 30 years ago, the Medical Home is an organizing principle designed to ensure that primary care is holistic, family-centered, and coordinated (Sia and Peter, 1988). Primary care Medical Homes provide preventive care, chronic care management, care coordination and access in some form all day, every day (PCPCC, 2019). This approach has been highly effective (Palfrey et al, 2004).

As a basic principle, the Medical Home model has been employed here at least since since 1997 (PCPCC, 2019). Alabama Medicaid's Health Home initiative, spread statewide in 2015, is built on the concept of Medical Home (Alabama Medicaid).

Numerous studies have shown the benefit of the Medical Home. One Medical Home initiative demonstrated effectiveness in increasing patient satisfaction with their pediatric primary care (Palfrey et al, 2004). This was reflected in a variety of high proportion measures like consistency of medical professionals, expedient sick-child medical care, and ease of specialist referral, among others. Not only does the Medical Home provide more effective care, it also provides a more equitable distribution of care. One study shows the concept can be used effectively in treating children in rural areas (Farmer et al, 2005).

While the Medical Home concept has been accepted by most primary care physicians, there are still major barriers, specifically geographic. With limited access to healthcare providers, as demonstrated in the first half of the report, families are forced to utilize episodic care centers like emergency rooms, acute care clinics, or go without care entirely. The Medical Home as a paradigm for rural healthcare can better integrate families and providers' understanding of the needs of pediatric patients, address the disparities in services provided, and reach rural and underserved communities with more effective healthcare.

increasing access

SCHOOL-BASED HEALTH CENTERS

One of the most obvious symbols of the State of Alabama's power to enact change for kids is the public school; rural or urban, rich or poor, nearly every community has a public school that is run by the state government for the benefit of every child in that community. School-based health programs are a substantive option for addressing the medical needs of children regardless of income. As community hubs, many of the issues surrounding access and utility have been addressed: bus routes to pick up hard-to-reach kids have been mapped out and well researched by public transportation experts, facilities have to be regulated and maintained by state law, using schools as public health hubs offers unique opportunities to access a diverse array of specialized care like dentistry and mental healthcare while relieving the burden on working parents to take their children to specialized care facilities.

Data and research reinforce these claims. Using schools as hubs for public health interventions has produced very strong data regarding positive health outcomes for children, especially those children living in lower-income circumstances. For example, in the field of pediatric dentistry, integrating dental care into school-based healthcare programs resulted in statistically significant improvement in oral health for underserved children. Additionally, the more interactions students had with school-based dental interventions, the more significant their results and outcomes (Simmer-Beck et al, 2015). The fact that this healthcare was provided in the context of a larger school-based healthcare program also served to decrease access issues that normally affect children in hard-to-reach or impoverished circumstances (Simmer-Beck et al, 2017).

School-based health centers' benefits aren't limited to physical or dental health, either. By eliminating barriers to health service access, school-based health centers increase the likelihood children and adolescents will seek care for high-risk behaviors. This is significant due to the scope of the mental health issue among children and adolescents; by some estimates 10-25% of

all children and adolescents in the United States suffer from some kind of mental health issue (Mason-Jones et al, 2012). This percentage is especially troubling when considering that Alabama was one of only four states in the top quartile in both the percentage of children with mental health disorders, as well as children who have not received treatment for these issues (Whitney and Peterson, 2019). These interventions have particular cost benefits to young people by reducing existing health disparities between children and adults from secondary care facilities. School-based health centers also serve to reduce disparities in access to care to which both race and physical capability contribute (Guo et al, 2010).

Research shows school-based health centers can have a significant and positive impact on all facets of children's medical lives. In addressing the needs of disadvantaged children and students, the introduction and expansion of school-based health centers greatly increases students' access to effective care (Guo et al, 2008). Expanding the existing school-based health center programs in Alabama would serve as a significant step forward in addressing the needs of underserved students, rural and urban, across the state.

Rural Medical Training Programs

One of the most statistically effective ways of increasing the numbers of doctors or physicians serving rural areas is by introducing rural training and residency programs into medical school curricula. One review estimated 53% to 64% of students that took part in one of a 10 program sample of rural medical education programs returned to rural areas to practice. If programs this effective were implemented by 125 medical schools, the researchers estimated more than double the number of projected rural doctors compared to the estimate without such programs (Rabinowitz et al, 2008).

This predictive trend goes beyond general and family practice and includes surgical practice as well. In a micro level experimental design, a cohort of surgical residents who completed a rural year after their fourth year of residency were more likely to not simply become surgeons,

but were also more than five times as likely to pursue their surgical career in locations with populations of less than 50,000 people (Deveney et al, 2013). Rural education for medical students isn't just a theoretical intervention that shows promise for Alabama's least served communities; in fact, it has demonstrated effectiveness within the state. Participants in Alabama's Rural Medical Scholars (RMS) program were more than twice as likely to become rural doctors as graduates from regional campuses, and more than four times as likely to be rural doctors as graduates from the University of Alabama School of Medicine's main campus (Wheat, 2017).

These intervention programs offer persistent, statistically significant increases in physician exposure to rural and underserved communities and the desire to remain and serve them. In the case of graduates of Jefferson Medical College, participants in the Physician Shortage Area Program (PSAP) were over 20% more likely to be practicing family medicine in the same rural area after 11 to 16 years than their non-PSAP counterparts (Rabinowitz, 2005). This indicates rural medical education programs are not only effective at incentivizing medical students to pursue careers in rural and underserved areas, but participation in them is also a stronger indicator of a long-term commitment to serving those same rural areas.

Studies also show that rural medical training programs are more effective at addressing the issue of rural medical deserts than other common intervention recommendations. An analysis of three rural medical programs' graduates, compared to international medical graduates (IMGs), showed that rural medical program participants were 10 times more likely to practice in rural areas than international graduates (Rabinowitz, 2012). These rural programs are also four times as likely to produce rural specialists, compared to the number of IMGs. These statistics are significant when considering the relative effectiveness of a number of strategies to address rural practitioner shortages.

One of the largest barriers to adequate medical care for children and adults in rural areas is distance from a provider. Programs exposing medical students to practice in underserved areas consistently create more rural doctors, and equally as important, retain them in those same underserved areas. By reducing the disparity between urban and rural concentrations of physicians, people outside of major cities will be more likely to have access to quality healthcare.

Programs exposing medical students to practice in underserved areas consistently create more rural doctors, and equally as important, retain them in those same underserved areas.

Intervention Recommendations for Eliminating Barriers to Care

Financial Incentives for Practitioners in Underserved Areas

A significant factor in retaining practitioners in underserved areas are financial incentives to offset the costs of medical school. Like mid-education exposure training in underserved areas, financial incentives for practice in underserved communities is one of the few intervention recommendations involving a direct redistribution of human resources to targeted areas.

Similar to rural medical training, financial incentives prove to be highly effective as a motivator for practice in underserved areas (Barnighausen and Bloom, 2009). In their meta-analysis of 43 articles focused on the efficacy of financial incentives, Barnighausen and Bloom found that financial incentive programs have been effective in not only placing health professionals in underserved areas, but keeping them there. Unlike rural medical education, however, these professionals are less likely to remain in the underserved area in which they were originally placed. This means that financially incentivized professionals are likely to move from one underserved area to the next, rather than stay rooted in their initial placement zone (Barnighausen and Bloom, 2009).

This conclusion is reinforced when looking at loan repayment programs specifically (Renner et al., 2010). In examining rural retention programs, loan repayment appears to be statistically significant in helping to determine the specific locality of the professional. It shows financial incentive as a strong motivator for rural practice, and that this motivator can be targeted to address the underserved and rural areas which are most in need of medical professionals (Renner, et al., 2010).

Expanded Scope of Work for Allied Health Professionals

An immediate way to increase access to healthcare is the expansion of the existing health professional workforce. While the previous recommendations would take time to train doctors and dentists willing to serve in rural and underserved communities, one way to make an immediate impact would be available by expanding the scope of work allied health professionals can provide. By empowering nurse practitioners, dental hygienists, and similar health professionals to use the fullest extent of their training, more patients can be seen more effectively and efficiently, and the barrier between patients and the care they need is lessened (Beazoglou et al., 2012).

Studies have shown that such expanded scope of work allied health professionals have some of the most significant impacts on children, either through community clinics or school-based health centers (Bailit, et al. 2012). In dentistry, this medium of access eliminates two barriers in one, addressing both distance barriers and the limiting factors of dentists being necessary

Family income can differentially affect health outcomes, **roughly 35% of low-income children require dentist-level care**

SOURCE: *(Bailit et al., 2012)*

to perform tasks that some expanded scope of work allied health professionals are capable of completing. These practitioners' proven effectiveness with children also addresses an issue of differential health risks based on family income; low-income children are more likely to suffer from untreated tooth decay than their more affluent peers. But it is estimated that only 35% of those low-income children require dentist-level care. In fact, it appears that the majority of low-income children can be effectively treated by hygienist level practitioners, through preventive screenings and treatment (Bailit et al., 2012).

The value of expanded scope of work allied health professionals has also been proven in private practice efficiency examinations. In a non-experimental survey of dental practices that involve low, medium, and high delegation rates for dental hygienists, the question was asked: how does an expanded scope of work for non-dentists effect efficiency (in this case, outputs of number of patient visits and gross billings, and inputs of annual work hours for dentists, hygienists, assistants, and staff). After adjusting for practice size (number for dentist and auxiliary hours, for example), the study found practices which delegated more responsibility had significantly higher numbers of patient visits (Beazogolou et al., 2012).

Importantly, the expansion of scope of work for allied health professionals positively impacts billable procedures and gross income for private practice. The same study that found higher patient visits with an expanded scope of practice professionals also noted that the gross billings increased significantly. Interestingly, when practices delegated more work to allied health professionals, the two productivity measures increased as well (Beazogolou et al., 2012).

By increasing the scope of work for allied health professionals, a reasonable implication is access to health services would increase significantly, especially for underserved populations, such as children in poverty, or children living in rural areas (Bailit et al., 2012). But equally as important is the implication that the expansion of the scope of work for these professionals can increase efficiency and billings for private practices as well. Implementing an expanded scope of practice for allied healthcare practitioners appears to benefit private practices as well as public clinics and would allow the maximum number of patients to be seen and billable procedures to be charged (Beazogolou et al., 2012).

Intervention Recommendations for Eliminating Barriers to Care

Telemedicine

Telemedicine has been touted as one of the greatest examples of progress in the mission to expand access to medical services in rural and underserved areas. While there are many issues with implementing these services, especially in rural Alabama, the results of these interventions in other areas around the country and around the world have significantly reduced barriers and increased access to healthcare.

One of telemedicine's most promising capabilities is expanded care for chronic conditions by empowering patients to manage their own care with telemedical supervision and assistance (Brown et al., 2007). Telemedicine in chronic conditions like diabetes has proven to provide statistically significant cost savings and improved clinical outcomes. Patient-side compliance concerns, specifically regarding the collection of clinical data, have been less significant than previously anticipated. Ensuring that clinicians are empowered to provide web-specific services is vitally important to continued success (Brown et al., 2007).

The data shows telemedicine holds great promise for child- and adolescent-specific intervention. When combined with traditional practices for rehabilitation of common diseases in children and adolescents, telemedical interventions prove significantly effective (Santos, et al., 2014). These results persist whether the intervention addresses greater physical activity to avoid lifestyle diseases, or the regulation of pediatric and adolescent asthma. This indicates that telemedical treatment is viable for chronic conditions in children, just as it is in adults (Santos et al, 2014).

Telemedicine shows promise, not only in physical health, but in addressing the growing concerns around mental

Project ECHO - A fusion between telemedicine and specialty training, ECHO (Extension for Community Healthcare Outcomes) is a project that provides a mentorship and training program to help Primary Care Providers (PCPs) address the needs of patients with complex illnesses through video instruction. Facilitating a case-based system of instruction, specialists reach out to multiple PCPs simultaneously to help them identify and treat patients with more acute conditions (Komaromy et al, 2016). The ECHO Model increases efficiency and effectiveness for providers, with added benefits to both patient care and lower costs. By allowing specialists to remain in hubs like university medical centers and major cities, but projecting their knowledge and expertise to more remote practitioners, ECHO can serve as a provider-level intervention tool, better equipping providers to deliver more effective primary care (Hager et al, 2018).

health maintenance across the United States. In assessing several of the barriers to mental health in rural communities, telemental health has been identified as a solution to the issue of access to care, as well as an opportunity to lend support to remote practitioners. Increased patient privacy and combatting mental health stigma were also identified as possible positive outcomes of further investment in telemental health (Brown, et al., 2015).

It is important to note that Telemedicine, while being reliably and repeatedly shown as an effective method to improving access to care, may not be the answer for all Alabamians. According to 2015 data drawn from the National Center for Education Statistics, over 30% of all Alabama's households have no access to the internet; over 30% of Alabama's families have no dial-up, DSL, cable modem, fiber optic, or satellite internet connectivity (NCES, 2015).

30% *of Alabama's families have* ***no dial up, DSL, cable modem, fiber optic, or satellite internet connectivity***

SOURCE: *(NCES, 2015)*

conclusion

A broad and diverse set of data sources shows something that should be common knowledge; there is a massive gap in access to quality healthcare for children across the state. Pediatric healthcare deserts present themselves in a variety of ways: in exaggerated proportions of patients to practitioners, a fundamental lack of pediatric specialists, or an inequitable distribution of subspecialist skills around the state. This paper has, however, addressed reasonable and data-driven interventions which could help combat these issues: exposing and incentivizing medical students and young doctors to rural and underserved community practice, expanding the scope of work of allied health professionals to more effectively distribute healthcare burdens across practitioners, and exploring a diverse set of opportunities to expand the reach and effectiveness of telemedicine through patient- and practitioner-level interventions. The Medical Home principle is also worth promoting and expanding in the state; this philosophy encourages holistic and cooperative healthcare that successfully addresses the needs of pediatric patients across the state.

The opportunities to make a difference in care are nearly limitless. This white paper has provided the data necessary to help stakeholders make informed decisions about which counties have the most need, as well as what interventions can be most effective in addressing those needs. Children across Alabama deserve quality healthcare; as a state we have made tremendous strides in removing the systemic barriers but more work remains to be done. This white paper will help target responses and create a climate where all children can get the quality healthcare they so desperately deserve.

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Maps and Visual Aids

A variety of sources were consulted for the maps and visual aids in this white paper.

The hospital closures since 2000 map was generated by AL.com's Reckon service, which provides data-driven visual representations for a variety of issues facing the state.

The declining obstetrics in Alabama map was sourced from the Alabama Rural Health Association, and was generated by the Alabama Department of Public Health's Office of Rural Health and Primary Care in conjunction with the Alabama Rural Health Association.

The Primary Care, Mental, and Dental Health Provider Shortage Area (HPSA) Maps were sourced from Alabama's Department of Public Health (ADPH). Specifically sourced from ADPH's Office of Rural Health and Primary Care, the Primary Care HPSA map was generated by Danita Crear, and the Mental and Dental HPSA maps were generated by Niko Phillips.

The legends for the HPSA maps were sourced from the United States Health Resources & Services Administration. Retrieved from https://bhw.hrsa.gov/shortage-designation/hpsa-process

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