Solving Arkansas's Primary Care Problems by Empowering Nurse Practitioners

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Mitch Mitchell
Zachary Helms
Jordan Pfaff

Arkansas Center for Research in Economics
University of Central Arkansas
College of Business
210 Donaghey Avenue
Conway, Arkansas 72035

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Nurse Practitioners (NPs) — skilled providers of primary care — can save Arkansans' money and improve our health. All we have to do is remove the rules that stop them.

Problems:

- Arkansans' lack sufficient access to primary care — especially in rural and poor areas.
- Estimates suggest that as many as one-fifth of Arkansas Medicare patients are receiving care outside of Arkansas.
- In Arkansas, NPs are not allowed to perform many important services even though they received professional training in those areas and can be just as effective at providing them as physicians.
- These restrictions increase wait-times and costs and force physicians to spend valuable time on services that could be provided by NPs.
- Diabetic care, a particularly serious problem in Arkansas, is reduced when there are primary care shortages.

Solution:

- Twenty-one other states have less restrictions on NPs than Arkansas. Research has shown that NPs can be just as effective as physicians at providing primary care. Empowering NPs by improving Arkansas regulations would improve outcomes across the board without reducing patient safety.

Solving Arkansas's Primary Care Problems by Empowering Nurse Practitioners

Introduction

Like the rest of the country, Arkansas faces a growing shortage of primary care physicians. One promising way to address this shortage is to expand nurse practitioners' ability to provide primary care.

Although 21 states currently allow nurse practitioners to provide primary care, Arkansas's regulations restrict their ability to practice and limit their ability to meet Arkansans' primary care needs.

This restriction is shortsighted. Nurse practitioners are more likely than physicians to work in rural areas, where primary care needs are most acute and where meeting those needs can have an especially powerful effect on obesity and diabetes rates. Restricting nurse practitioners raises health and medical costs for Arkansans.

In this brief, we explain the scope of the primary care crisis in Arkansas; examine the current limitations on nurse practitioners; and explore the benefits of expanding their scope of practice. To get a sense of the practical implications of the crisis—and the potential role nurse practitioners could play in resolving it—we analyze the case of diabetes in Arkansas.

Arkansas faces a shortage of primary care physicians, burgeoning costs of care, and rising disparity in access to care. While there's no silver-bullet solution, implementing smart policies based on data and peer-reviewed research will make Arkansans better off. One such policy should be to reduce restrictions on nurse practitioners in order to alleviate the primary care shortage.

The Primary Care Crisis

Our nation's shortage of primary care physicians stems from many factors,[1] among them an aging population that needs more care than a younger population, and financial incentives for medical students to choose specialties that are more lucrative than primary care.[2] What makes this primary care

1 A. Grover and L. M. Niecko-Najjum, "Building a Health Care Workforce for the Future: More Physicians, Professional Reforms, and Technological Advances," *Health Affairs* 32, no. 11 (2013): 1922–27; Association of American Medical Colleges, *AAMC Physician Workforce Policy Recommendations* (Washington, DC: AAMC, 2012), https://californiahealthline.files.wordpress.com/2014/05/2012aamcworkforcepolicyrecommendations.pdf.

2 R. L. Phillips, A. M. Bazemore, and L. E. Peterson, "Effectiveness over Efficiency: Underestimating the Primary Care Physician Shortage," *Medical Care* 52, no. 2 (2014): 97–98; P. Jolly, C. Erikson, and G. Garrison, "US Graduate Medical Education and Physician Specialty Choice," *Academic Medicine* 88, no. 4 (2013): 468–74.

shortage and its consequences worse is that it disproportionately affects people who reside in poor areas and rural areas.[3]

Although the shortage of primary care providers is a nationwide concern, Arkansas feels the shortage more acutely than most states do. In 2010, Arkansas ranked second in the nation for fewest physicians per resident, with considerable variation in primary care access between counties.[4] Residents of counties with the least access to primary care, such as those along the poor, rural Mississippi Delta, often face difficult health issues such as obesity and diabetes that can be prevented and ameliorated with increased access to primary care.[5]

Nurse Practitioners: Current Restrictions, Future Possibilities

Among the various proposals for addressing the shortage of primary care providers, the most promising is the increased use of nurse practitioners.[6] These nurses, who have earned a master's degree in nursing science or a doctorate in nursing practice, have completed both advanced coursework and clinical training. Like physicians, nurse practitioners can pursue many practice specialties. Unlike physicians, who often choose more lucrative specialties, more than 80 percent of nurse practitioners choose primary care.[7]

Currently, 21 states and the District of Columbia allow nurse practitioners full practice authority, licensing them to evaluate and diagnose patients, order and interpret tests, manage treatments, and prescribe medicine.[8] Unlike these states, Arkansas limits nurse practitioners, especially as it relates to prescriptive authority and payment reimbursement. If Arkansas gave nurse practitioners greater authority, they could provide needed primary care to Arkansans.

Analysis: Access to Primary Care

To gain a state-level view of Arkansas's primary care crisis, we examined two data sets.

First, we examined county-level data from the Area Health Resources Files (AHRF), which come from the US Department of Health and Human Services' Health Resources and Services Administration. The files compile aggregate data at the county, state, and national levels from

3 S. M. Patterson et al., "Unequal Distribution of the US Primary Care Workforce," *American Family Physician* 87, no. 11 (2013), https://www.aafp.org/afp/2013/0601/od1.html.

4 Advisory Board, "The 10 States Facing the Biggest Physician Shortages," October 22, 2012, https://www.advisory.com/Daily-Briefing/2012/10/22/The-10-states-facing-the-biggest-physician-shortages.

5 A. H. Gaglioti et al., "Access to Primary Care in US Counties Is Associated with Lower Obesity Rates," *Journal of the American Board of Family Medicine* 29, no. 2 (2016): 182–90; E. R. Lenz et al., "Diabetes Care Processes and Outcomes in Patients Treated by Nurse Practitioners or Physicians," *Diabetes Educator* 28, no. 4 (2002): 590–98.

6 J. K. Iglehart, "Expanding the Role of Advanced Nurse Practitioners—Risks and Rewards," *New England Journal of Medicine* 368, no. 20 (2013): 1935–41.

7 "AANP National Nurse Practitioner Sample Survey" accessed September 13, 2016

8 American Association of Nurse Practitioners, "State Practice Environment," accessed May 26, 2016, https://www.aanp.org/legislation-regulation/state-legislation/state-practice-environment.

multiple sources (e.g., the American Medical Association, American Hospital Association, US census, etc.) into a single healthcare database. These data helped us determine the availability of primary care physicians at the county level.

We then examined individual medical claims data from the Centers for Medicare and Medicaid Services. This analysis helped us to better understand access to care among elderly Arkansans—a growing demographic that tends to have more frequent and more serious healthcare needs as well as higher healthcare costs.

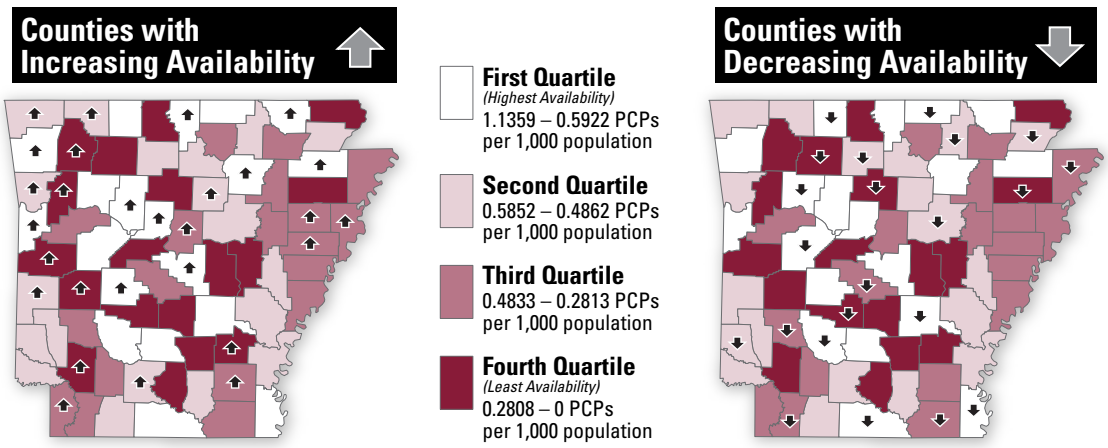
In the following sections, we describe our approach to each dataset and what we learned.

How Easily Can Arkansans Access Primary Care?

Using AHRF data, we calculated the number of primary care physicians (PCP) per 1,000 persons in each Arkansas county from 2010 to 2013 (appendix A). In 2013, there were 0.65 PCPs per 1,000 Arkansans (or 1 PCP per 1,538 people). Figure 1 displays the PCP-to-population ratio for 2013.

Analysis of these datasets yields a complex story. Statewide, the ratio of PCPs to population grew by 2% per year from 2010 to 2013 (appendix A). However, there was considerable variation among counties: while more physicians are available to serve the population in urban areas in the central, northwest, northeast, and southern portions of the state, 22 counties experienced a

Figure 1.
Availability of Primary Care



The number of primary care physicians per 1,000 persons was determined for the year 2010.
The increase or decrease is measured as the change in the numbers between the years 2010 and 2013.

Source: Area Health Resource Files 2013 from the US Department of Health and Human Services' Health Resources and Services Administration.

decrease in PCPs per 1,000 persons. Though some counties saw increases, severe drops occurred in rural Newton and Lafayette counties, which each saw a *50% decline* in the number of PCPs per 1,000 persons in the same four-year period.

There are several counties that would see huge gains if nurse practitioners were allowed further scope of practice. One example is Van Buren County. Currently, Van Buren County has 1 primary care physician for every 8,333 residents. If regulations on nurse practitioners practicing primary care were less restrictive, that number would go to 1 primary care provider for every 1,538 residents. Newton County is very similar, as the amount of residents per 1 primary care provider would move from 7,692 to 1,587. For the average Arkansas county, the amount of residents per 1 primary care provider would move from 2,877 to 1,611. Placing fewer restrictions on nurse practitioners who want to practice primary care can drastically improve access to primary care providers.[9]

What Medicare Claims Data Tell Us about Arkansas's Primary Care Shortage

Arkansas's growing elderly population is often cited as a factor in the state's increased demand for primary care services.[10] To assess whether Arkansas's current primary care workforce can meet the primary care needs of the state's elderly, we examined administrative claims data from the 2013 Centers for Medicare and Medicaid Services' 5% Research Identifiable Files (RIF). This dataset contains all fee-for-service claims associated with a 5% national sample of Medicare beneficiaries.

We identified all physician services performed on beneficiaries residing in Arkansas. We then identified the state in which these services were performed and tabulated the number and percentage of services performed by providers in Arkansas and providers in other states. Separately, we identified all Medicare services provided by Arkansas physicians and tabulated the number and percentage of services performed on patients in Arkansas and in other states (table 1, next page).

As table 1 shows, almost 1 in 5 Arkansas Medicare patients received care outside Arkansas. While it is possible that these patients lived near a state border and simply traveled to the nearest provider regardless of state, findings indicate that these Arkansans were not able to get the care they needed in state. Furthermore, we find that 94% of Medicare patients who saw Arkansas physicians were Arkansas residents. If Arkansas physicians are not seeing many out-of-state patients while many patients are driving to see out-of-state physicians, Arkansas physicians are likely close to capacity, forcing patients to drive out of state to get medical care.

Based on this information, we can infer the following:

• Even if Arkansas physicians had provided 100% of their 2013 Medicare services

9 Thanks to ACRE research assistant Aaron Newell for help with this analysis.

10 Phillips, Bazemore, and Peterson, "Effectiveness over Efficiency."

State	Arkansas Patient Services by Physician's State		Arkansas Physician Services by Patient's State	
Arkansas	946,285	(81%)	946,285	(94%)
Texas	70,327	(6%)	27,420	(3%)
Missouri	38,379	(3%)	9,806	(1%)
Kansas	28,016	(2%)	4,486	(0%)
Tennessee	25,646	(2%)	2,439	(0%)
All Others	57,803	(5%)	16,739	(2%)
Total	1,166,456	(100%)	1,007,175	(100%)

Source: Center for Medicare and Medicaid Services, 2013

Table 1. **State of Service for Arkansas Medicare Patients and State of Medicare Patient for Arkansas Physicians**

to Arkansas patients and 0% to out-of-state patients, these physicians could not have met the demand for 14% of the Medicare services that elderly Arkansas residents needed.[11]

• Unless Arkansas physicians had the capacity to schedule additional appointments, they would have had to see more Medicare patients and fewer commercially insured patients to meet that need.

Nurse Practitioners: Scope of Practice

To clearly understand the effect of current restrictions on nurse practitioners, it is important to understand both their scope of practice and the practice environment around the country. *Scope of practice* refers to a medical professional's legal ability to perform specific procedures, such as referring patients to specialists, prescribing medicine, and ordering diagnostic tests. The American Association of Nurse Practitioners (AANP) has established three scope-of-practice categories—full practice, reduced practice, and restricted practice)—and has classified each state according the scope of practice allowed to nurse practitioners (figure 2).

Arkansas's scope-of-practice regulations place it in the AANP category *reduced practice*. Arkansas code does not recognize nurse practitioners as primary care providers. Instead, it requires nurses to work under a collaborative practice (oversight) agreement with a physician practice. And Arkansas nurse practitioners can only prescribe schedule III–V drugs, while some states allow nurse practitioners to prescribe schedule II drugs as well. The relevant Arkansas codes are excerpted in appendix C.

Collaborative practice agreements often include a series of protocols, a schedule for the physician's analysis of the nurse practitioner's patient charts, and the specific

11 We arrived at 14% by the following calculation: (1,166,456 – 1,007,175) / 1,166,456.

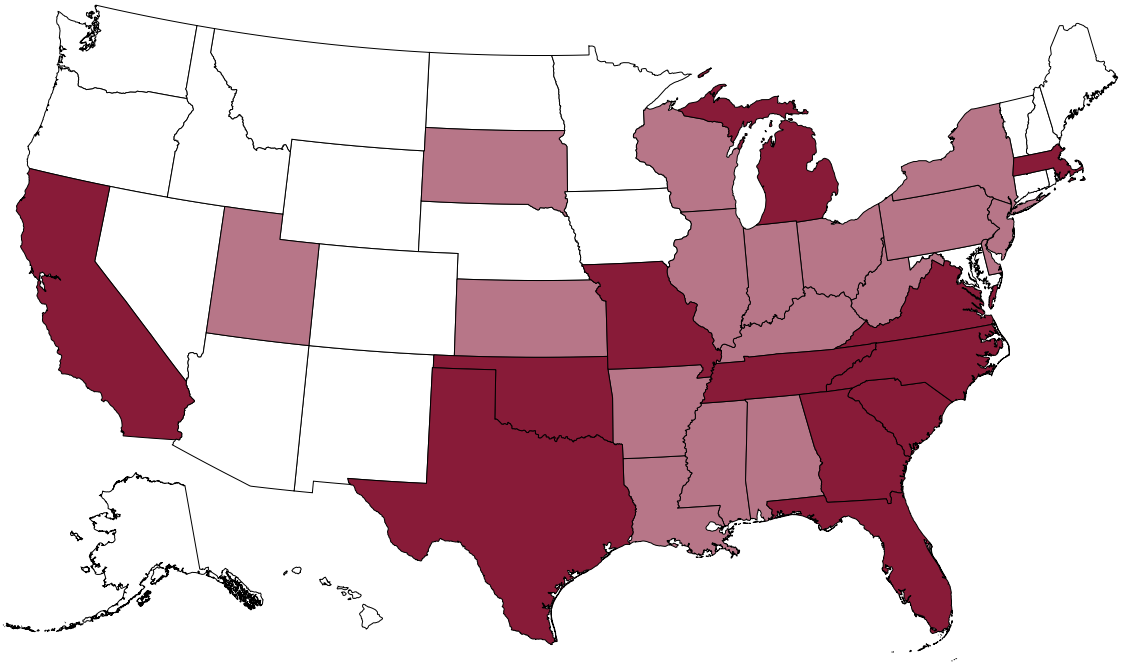


Figure 2.

Nurse Practitioner Scope of Practice, 2015

Full Practice: State practice and licensure law provides for all nurse practitioners to evaluate patients, diagnose, order and interpret diagnostic tests, initiate and manage treatments — including prescribe medications — under the exclusive licensure authority of the state board of nursing. This is the model recommended by the Institute of Medicine and National Council of State Boards of Nursing.

Reduced Practice: State practice and licensure law reduces the ability of nurse practitioners to engage in at least one element of NP practice. State law requires a regulated collaborative agreement with an outside health discipline in order for the NP to provide patient care or limits the setting or scope of one or more elements of NP practice.

Restricted Practice: State practice and licensure law restricts the ability of a nurse practitioner to engage in at least one element of NP practice. State requires supervision, delegation, or team-management by an outside health discipline in order for the NP to provide patient care.

Source: American Association of Nurse Practitioners, https://www.aanp.org/legislation-regulation/state-legislation/state-practice-environment, accessed May 26, 2016.

rights and responsibilities of each party. They are costly for the nurse practitioner because physicians charge for these agreements. They also increase the physician's malpractice insurance premiums. Moreover, if the physician cancels the agreement, the nurse practitioner must cease working as a sole practitioner until he or she signs a new collaborative practice agreement.

Why Regulation and Restriction?

The regulation of nurse practitioners is driven by stated concerns for patient safety, with the American Medical Association strongly supporting scope-of-practice laws that prevent nurse practitioners from providing primary care without

physician oversight.[12]

Although regulations are often implemented to safeguard the public, they can sometimes do more harm than good. For example, excessive regulation may not offer meaningful protection from risk or danger, but it may create practice barriers that curb competition. In the case of nurse practitioners, these barriers restrict the services they may provide,[13] leading to several problems:

- difficulty scheduling appointments for primary care and routine visits
- longer in-office waiting times to see a provider
- higher patient and payer healthcare costs
- higher administrative costs for physician practices employing nurse practitioners

More generally, reduced competition leads to less innovation and greater consolidation, which ultimately increase costs and reduce access to care.

Thus, if we consider their overall impact, even well-meaning regulations may not be effective. A successful regulation is one that balances consumer protection and market competition. Successful regulations often begin with a focus on a regulation's overall outcomes rather than the inputs that comprise it.

The Federal Trade Commission has examined state regulations of advanced practice nurses, concluding that their training and experience frequently exceed what is necessary to protect consumers.[14] In fact, a considerable body of research indicates that nurse practitioners provide their primary care patients with care of a quality comparable to physician care.[15] One notable piece of evidence is a 2011 Institute of Medicine (IOM) report recommending that advanced nurse practitioners be free to practice to the full extent of their training.[16] Based on this research and the experience of nurse practitioners in states that allow full practice, the National Governors Association has recommended that all states allow

12 Iglehart, "Expanding the Role of Advanced Nurse Practitioners."

13 M. M. Kleiner et al., "Relaxing Occupational Licensing Requirements: Analyzing Wages and Prices for a Medical Service," working paper w19906, National Bureau of Economic Research, 2014; P. Pittman and B. Williams, "Physician Wages in States with Expanded APRN Scope of Practice," *Nursing Research and Practice*, 2012; J. A. Fairman et al., "Broadening the Scope of Nursing Practice," *New England Journal of Medicine* 365 (2011): 193–96.

14 Federal Trade Commission, "Competition and the Regulation of Advanced Practice Nurses" (Washington, DC: FTC, 2014) https://www.ftc.gov/system/files/documents/reports/policy-perspectives-competition-regulation-advanced-practice-nurses/140307aprnpolicypaper.pdf.

15 M. Swann et al., "Quality of Primary Care by Advanced Practice Nurses: A Systemic Review," *International Journal for Quality in Health Care* 27, no. 5 (2015): 396 –404; R. P. Newhouse et al., "Advanced Practice Nurse Outcomes 1990–2008: A Systematic Review," *Nursing Economics* 29, no. 5 (2011): 230–50; M. Laurant et al., "Substitution of Doctors by Nurses in Primary Care," *Cochrane Database Systematic Reviews*, 2:CD001271 (April 18, 2005); D. W. Roblin et al., "Use of Midlevel Practitioners to Achieve Labor Cost Savings in the Primary Care Practice of an MCO," *Health Services Research* 39, no. 3 (2004): 607–26; E. R. Lenz et al., "Primary Care Outcomes in Patients Treated by Nurse Practitioners or Physicians: Two-Year Follow-Up," *Medical Care Research and Review* 61, no. 3 (2004): 332–51; M. O. Mundinger et al., "Primary Care Outcomes in Patients Treated by Nurse Practitioners or Physicians: A Randomized Trial," *Journal of the American Medical Association* 283, no. 1 (2000): 59–68; P. Venning et al., "Randomised Controlled Trial Comparing Cost Effectiveness of General Practitioners and Nurse Practitioners in Primary Care," *BMJ: British Medical Journal* 320, no. 7241 (2000): 1048–53.

16 Institute of Medicine, *The Future of Nursing: Leading Change, Advancing Health* (Washington, DC: National Academies Press, 2011).

nurse practitioners full practice authority to help alleviate the growing primary care shortage.[17]

How Will Expanding Scope of Practice Address the Primary Care Crisis?

The main argument for expanding nurse practitioners' scope of practice is that it directly increases the number of providers available to offer primary care services. However, there are many other advantages as well.

Improved Access in Underserved Areas

Nurse practitioners are much more likely to practice in rural and underserved areas than physicians are.[18]

Innovation

The increased use of nurse practitioners is likely to spur innovation in healthcare delivery. For example, clinics staffed with advanced-practice nurses generally offer weekend and evening hours. This innovation not only provides greater flexibility for patients, but provides competitive incentives for other clinics to offer extended hours as well.[19]

Greater Physician Focus

Although nurse practitioners receive excellent training for primary care, they do not replace physicians. According to the Institute of Medicine,[20] expanding nurse practitioners' scope of practice has not diminished physicians' critical role in patient care, nor has it lowered physicians' incomes. Rather, greater use of nurse practitioners allows primary care physicians to focus on higher-cost and more complex services, which may lead to lower overall costs and higher-quality care for patients.[21]

Will Full Practice Authority Attract New Nurse Practitioners to Arkansas?

Competition for the service of nurse practitioners is increasing. At present, 21 other states currently allow full practice for nurse practitioners. If Arkansas expands its scope of practice, will it be able to attract enough nurse practitioners to alleviate the

17 National Governors Association, "The Role of Nurse Practitioners in Meeting Increasing Demand for Primary Care," December 20, 2012, http://www.nga.org/cms/home/nga-center-for-best-practices/center-publications/page-health-publications/col2-content/main-content-list/the-role-of-nurse-practitioners.html.

18 Federal Trade Commission, "Competition and the Regulation of Advanced Practice Nurses"; K. Grumbach, "Who Is Caring for the Underserved? A Comparison of Primary Care Physicians and Nonphysician Clinicians in California and Washington," *Annals of Family Medicine* 1, no. 2 (2003): 97–104; K. Martin, "Nurse Practitioners: A Comparison of Rural-Urban Practice Patterns and Willingness to Serve in Underserved Areas," *Journal of the American Academy of Nurse Practitioners* 17 (2000): 337–41.

19 Massachusetts Department of Public Health, "Commonwealth to Propose Regulations for Limited Service Clinics: Rules May Promote Convenience, Greater Access to Care," 2007, http://www.mass.gov/?pageID=pressreleases&agId=Eeohhs2&prModName=dphpressrelease&prFile=070717_clinics.xml.

20 Institute of Medicine, *The Future of Nursing*.

21 M. H. Katz, "The Right Care by the Right Clinician," *JAMA Internal Medicine* 175, no. 1 (2015): 108; D. R. Hughes, M. Jiang, and R. Duszak, "A Comparison of Diagnostic Imaging Ordering Patterns between Advanced Practice Clinicians and Primary Care Physicians Following Office-Based Evaluation and Management Visits," *JAMA Internal Medicine* 175, no. 1 (2015): 101 –07.

primary care shortage? An examination of the data indicates that the answer is probably yes.

Arkansas's average nurse practitioner's salary ($93,870) is lower than the national average ($101,260),[22] but it is comparable to that of Arkansas's neighboring states—all of which have similar or more restrictive scope-of-practice regulations (figure 2). Arkansas's costs of living is also below the national average. If Arkansas allowed full practice, greater opportunities might incentivize advanced practice nurses from neighboring states to relocate to Arkansas, and its relatively low cost of living might attract those currently working in full-practice but high-cost-of-living states. Moreover, the average $37,000 salary difference between nurses and nurse practitioners already incentivizes registered nurses in Arkansas and surrounding states to pursue advanced training. Using AHRF data, we estimate that the number of nurse practitioners in Arkansas grew 10% per year from 2010 to 2013 (appendix B), indicating that Arkansas is competitive in this field.[23]

Using a classic statistical method (appendix C), we analyzed the number of nurse practitioners in each of the 50 states. We began with a score measuring nurse practitioners' ability to refer patients to specialists, work without a collaborative practice agreement, work without specific physician involvement, and prescribe schedule II–V drugs. We also accounted for the percent of the population that lives in rural areas, the percent of the population that lives in poverty, and the per capita real GDP.

We found that reductions in scope of practice—and limits in prescriptive authority in particular—reduce the number of NPs per 1,000 in each state. We get the same basic results when we score nurse practitioners' ability to practice in different ways.

22 Bureau of Labor Statistics, Occupational Employment and Wages, May 2014, 29-1171 Nurse Practitioners.

23 Many of Arkansas's neighboring states have proposed legislation allowing full practice authority for nurse practitioners.

Diabetes: A Primary Care Case Study

Incidence of Diabetes in Arkansas

According to the Centers for Disease Control and Prevention (CDC), 9.3% of the US population has diabetes, and the annual costs of the disease are $176 billion in medical costs and another $69 billion in indirect costs such as disability, work loss, and premature death.[24] Arkansas is no different.

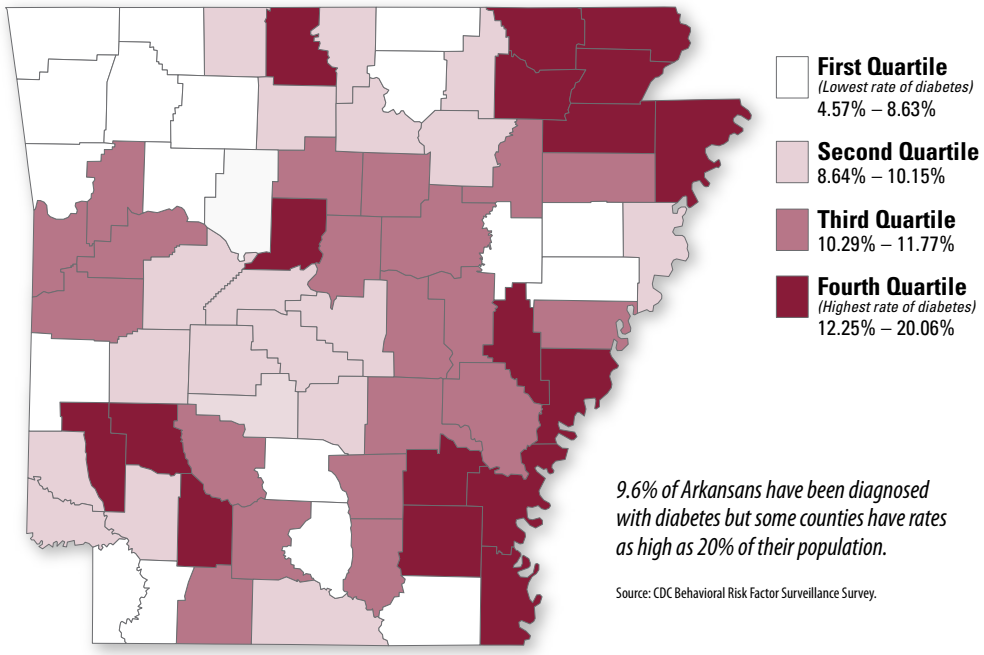
Using data from the CDC's 2010 Behavioral Risk Factor Surveillance Survey (BRFSS), we calculated the incidence of diabetes at the state and county levels using the responses to the question, "Have you ever been told by a doctor that you have diabetes?" Statewide, 9.8% of the Arkansas population has been diagnosed with diabetes. However, there is considerable variation at the county level (figure 3).

The highest incidence of diabetes occurs in the southeast (Desha County, 17.9%; Phillips County, 17.2%) and in the northeast corner (Clay County, 20.1%) of the state. The northwest and northeast areas of the state generally have the lowest incidence (6.2% to 12.7%). Miller County, in the state's southwest corner, has the lowest incidence of diagnosed diabetes at 4.6%. For context Desha County has .49 primary care physicians per

24 Centers for Disease Control and Prevention, *National Diabetes Statistics Report: Estimates of Diabetes and Its Burden in the United States* (Atlanta: US Department of Health and Human Services, 2014).

Figure 3.

Arkansas Incidence of Diabetes, 2010



Year	Hospital Discharges	Aggregate Costs ($)
2006	5,810	35,885,756
2007	5,854	35,994,646
2008	6,032	39,316,189
2009	5,813	38,744,552
2010	5,958	43,616,476
2011	6,216	45,056,091
2012	6,011	43,331,640
2013	6,104	44,836,952
% Change	5.1	24.9
Growth Rate %	0.7	3.2

Source: Analysis of US Dept. of Health and Human Services Area Health Resources Files and CMS 5 percent Medicare Claims Files.

Table 2. Uncontrolled Diabetes Hospitalizations in Arkansas

1,000 people and Phillips County has .35 primary care physicians per 1,000 people. The state average is .54 primary physicians per 1,000 people. Miller County is lucky to have the lowest incidence of diagnosed diabetes since it also has a below average number of primary care physicians (.30).

Table 2 presents the costs associated with hospitalizations from uncontrolled diabetes in Arkansas from the Agency for Healthcare Research and Quality's Healthcare Cost and Utilization Project. In 2013, diabetes hospitalizations in Arkansas cost $44.8 million—which doesn't even include the annual cost of treatment for the more than 200,000 diabetes patients who are not hospitalized.

Reducing uncontrolled diabetes hospitalizations by 25% would save $11.2 million per year. It would also mean that 1,526 fewer people would have to endure a hospital stay or the severe conditions that lead to those stays.

Diabetes and Nurse Practitioners

Extensive evidence shows that primary care interventions have substantial effects on the risk factors, incidence, and control of diabetes.[25] Thus, anything alleviating the primary care shortage could have dramatic effects on diabetes care and outcomes. However, the gains appear to be magnified when primary care diabetes interventions are managed by advanced practice nurses.[26] There is no consensus regarding the reasons for this finding, although possible explanations are that nurse practitioners

- spend an average of 12 minutes face-to-face with patients, compared to a physician's average of 7 minutes;[27]

25 Gaglioti et al., "Access to Primary Care in US Counties Is Associated with Lower Obesity Rates"; S. Ferguson, M. Swan, and A. Smaldone, "Does Diabetes Self-Management Education in Conjunction with Primary Care Improve Glycemic Control in Hispanic Patients? A Systemic Review and Meta-Analysis," *Diabetes Educator* 41, no. 4 (2015): 472–84; J. Ma et al., "Translating the Diabetes Prevention Program Lifestyle Intervention for Weight Loss into Primary Care: A Randomized Trial," *JAMA Internal Medicine* 173, no. 2 (2013): 113–21; M. Stellefson, K. Dipnarine, and C. Stopka, "The Chronic Care Model and Diabetes Management in US Primary Care Settings: A Systemic Review," *Preventing Chronic Disease* 10 (2013): E26.

26 P. A. Ohman-Strickland et al., "Quality of Diabetes Care in Family Medicine Practices: Influence of Nurse-Practitioners and Physician's Assistants," *Annals of Family Medicine* 6, no. 1 (2008): 14–22; E. A. Denver et al., "Management of Uncontrolled Hypertension in a Nurse-Led Clinic Compared with Conventional Care for Patients with Type 2 Diabetes," *Diabetes Care* 26, no. 8 (2003): 2256–60; Lenz et al., "Diabetes Care Processes and Outcomes in Patients Treated by Nurse Practitioners or Physicians."

27 Venning et al., "Randomised Controlled Trial Comparing Cost Effectiveness of General Practitioners and Nurse Practitioners in Primary Care."

- are more likely to document diabetes education in patient encounters;[28] and
- offer increased patient communication and follow-up care.[29]

Even if nurse practitioners and physicians manage diabetes patients equally well, simply increasing access to primary care services for these patients—who are frequently concentrated in Arkansas's most underserved areas—would generate substantial cost savings in diabetes care.

We examined the diabetes case because Arkansas ranks so poorly on diabetes care, and because it illustrates the problems emerging from Arkansas's primary care crisis. It is important to note, though, that permitting full practice for nurse practitioners would address many problems—not just diabetes.

Conclusion: Finding a Way through the Primary Care Crisis

Like the rest of the country, Arkansas faces a growing primary care shortage. This shortage affects both the quality and cost of Arkansans' care, which, in turn, affect Arkansans' quality of life. Giving nurse practitioners full practice authority could help resolve this shortage. Although it means change, solid evidence shows that the change would be positive. Evidence also indicates that allowing full practice authority offers a win-win solution to the problem of equitable access to care. Consider the benefits to each group:

Patients

- Increased access to primary care will result in better management of chronic disease, fewer hospitalizations, and a higher quality of life.
- Better management and fewer hospitalizations will drive healthcare costs down, leaving hardworking families with more cash in hand.
- An ample supply of primary care providers will ensure that people can more easily access care and will have greater choice in healthcare settings and locations—factors that strengthen the likelihood of seeking care.

Nurses

- Current nurse practitioners from around the country would have a strong incentive to relocate to Arkansas.
- Arkansas nurses without advanced practice standing will have an expanded opportunity for rewarding, patient-centered career growth and an increased incentive to seek advanced training.

Physicians

- Arkansas physicians will be able to focus on giving high-value, complex care.
- Arkansas physicians will benefit from fewer administrative costs for managing nurse practitioners (required by current regulations).[30]

28 Lenz et al., "Diabetes Care Processes and Outcomes in Patients Treated by Nurse Practitioners or Physicians."

29 G. C. Richardson, "Nurse Practitioner Management of Type 2 Diabetes," *Permanente Journal* 18, no. 2 (2014): e143-40, doi: 10.7812/TPP/13-108.

30 Porter has a widely accepted definition of value in healthcare where outcomes are divided by costs. M. E. Porter, "What Is Value in Health Care?" *New England Journal of Medicine 363*, no. 26 (2010): 2477–81.

Regulations are almost always passed with good intentions, but they can sometimes hurt vulnerable communities in surprising ways. This is the case in Arkansas's primary care crisis.

But a small change in occupational regulation could save lives and improve the health and financial well-being of all Arkansans—particularly those in underserved locations.

Appendix A:

Which Arkansas Counties Have Ample Access to Primary Care Physicians?

	PCPs per 1000 Pop				2010-2013	
County Name	**2010**	**2011**	**2012**	**2013**	**%Change**	**Annual Growth Rate**
State: Arkansas	**0.61**	**0.62**	**0.64**	**0.65**	**6%**	**2%**
Arkansas	0.54	0.48	0.54	0.54	0%	0%
Ashley	0.38	0.33	0.29	0.29	-25%	-10%
Baxter	0.76	0.93	0.83	0.86	13%	4%
Benton	0.50	0.52	0.54	0.56	12%	4%
Boone	0.75	0.70	0.70	0.70	-7%	-2%
Bradley	0.54	0.45	0.54	0.54	0%	0%
Calhoun	0.19	0.19	0.19	0.19	0%	0%
Carroll	0.58	0.58	0.65	0.61	6%	2%
Chicot	0.98	0.98	0.89	0.89	-9%	-3%
Clark	0.62	0.53	0.49	0.44	-29%	-11%
Clay	0.26	0.33	0.33	0.26	0%	0%
Cleburne	0.59	0.66	0.70	0.74	27%	8%
Cleveland	0.12	0.12	0.12	0.12	0%	0%
Columbia	0.54	0.54	0.54	0.54	0%	0%
Conway	0.66	0.76	0.71	0.71	7%	2%
Craighead	0.95	0.94	0.98	1.01	7%	2%
Crawford	0.49	0.49	0.49	0.50	3%	1%
Crittenden	0.44	0.48	0.44	0.46	5%	1%
Cross	0.46	0.46	0.46	0.52	13%	4%
Dallas	0.64	0.64	0.64	0.64	0%	0%
Desha	0.49	0.57	0.57	0.49	0%	0%
Drew	0.48	0.48	0.64	0.64	33%	10%
Faulkner	0.45	0.45	0.49	0.50	11%	4%
Franklin	0.28	0.28	0.34	0.34	20%	6%
Fulton	0.74	0.58	0.58	0.49	-33%	-14%
Garland	0.70	0.74	0.76	0.78	12%	4%
Grant	0.17	0.17	0.17	0.17	0%	0%
Greene	0.55	0.57	0.53	0.53	-4%	-1%
Hempstead	0.27	0.31	0.31	0.31	17%	5%
Hot Spring	0.24	0.24	0.24	0.21	-13%	-4%
Howard	0.52	0.52	0.52	0.52	0%	0%
Independence	0.87	0.87	1.00	0.92	6%	2%
Izard	0.30	0.15	0.30	0.30	0%	0%
Jackson	0.46	0.46	0.51	0.46	0%	0%
Jefferson	0.83	0.84	0.76	0.73	-12%	-4%
Johnson	0.69	0.65	0.62	0.62	-11%	-4%
Lafayette	0.28	0.28	0.14	0.14	-50%	-23%
Lawrence	0.35	0.35	0.35	0.35	0%	0%

	PCPs per 1000 Pop				2010-2013	
County Name	**2010**	**2011**	**2012**	**2013**	**%Change**	**Annual Growth Rate**
State: Arkansas	**0.61**	**0.62**	**0.64**	**0.65**	**6%**	**2%**
Lee	0.30	0.30	0.30	0.30	0%	0%
Lincoln	0.07	0.07	0.07	0.14	100%	23%
Little River	0.56	0.48	0.56	0.56	0%	0%
Logan	0.32	0.36	0.27	0.32	0%	0%
Lonoke	0.17	0.17	0.18	0.17	0%	0%
Madison	0.19	0.19	0.19	0.32	67%	17%
Marion	0.18	0.24	0.31	0.18	0%	0%
Miller	0.30	0.23	0.28	0.41	38%	11%
Mississippi	0.41	0.41	0.41	0.38	-6%	-2%
Monroe	0.53	0.40	0.53	0.53	0%	0%
Montgomery	0.11	0.22	0.22	0.22	100%	23%
Nevada	0.34	0.34	0.34	0.34	0%	0%
Newton	0.25	0.25	0.13	0.13	-50%	-23%
Ouachita	0.52	0.56	0.56	0.60	15%	5%
Perry	0.10	0.20	0.10	0.10	0%	0%
Phillips	0.35	0.35	0.35	0.35	0%	0%
Pike	0.45	0.36	0.36	0.36	-20%	-7%
Poinsett	0.21	0.21	0.16	0.12	-40%	-17%
Polk	0.54	0.54	0.54	0.64	18%	6%
Pope	0.62	0.62	0.66	0.63	3%	1%
Prairie	0.00	0.00	0.00	0.00	0%	0%
Pulaski	1.00	1.06	1.07	1.10	10%	3%
Randolph	0.63	0.57	0.57	0.68	9%	3%
St. Francis	0.37	0.41	0.45	0.45	20%	6%
Saline	0.37	0.36	0.37	0.36	-2%	-1%
Scott	0.19	0.19	0.28	0.28	50%	14%
Searcy	0.50	0.50	0.38	0.38	-25%	-10%
Sebastian	1.14	1.14	1.14	1.16	2%	1%
Sevier	0.52	0.57	0.46	0.46	-11%	-4%
Sharp	0.53	0.47	0.41	0.41	-22%	-8%
Stone	0.56	0.56	0.48	0.56	0%	0%
Union	0.82	0.77	0.92	0.80	-3%	-1%
Van Buren	0.18	0.12	0.12	0.12	-33%	-14%
Washington	0.66	0.71	0.77	0.78	18%	6%
White	0.51	0.48	0.47	0.50	-3%	-1%
Woodruff	0.43	0.43	0.43	0.43	0%	0%
Yell	0.59	0.46	0.50	0.55	-8%	-3%

Source: Area Health Resources Files (AHRF), from the US Department of Health and Human Services' Health Resources and Services Administration.

Appendix B:
Which Arkansas Counties Have Access to Nurse Practitioners?

	NPs per 1000 Pop				2010-2013	
County Name	2010	2011	2012	2013	%Change	Annual Growth Rate
State: Arkansas	**0.33**	**0.37**	**0.40**	**0.44**	**34%**	**10%**
Arkansas	0.38	0.32	0.32	0.38	0%	0%
Ashley	0.14	0.24	0.29	0.43	200%	37%
Baxter	0.51	0.56	0.59	0.66	29%	8%
Benton	0.20	0.22	0.27	0.30	49%	13%
Boone	0.24	0.32	0.30	0.40	67%	17%
Bradley	0.18	0.18	0.18	0.18	0%	0%
Calhoun	0.19	0.19	0.19	0.19	0%	0%
Carroll	0.14	0.22	0.25	0.22	50%	14%
Chicot	0.45	0.45	0.54	0.72	60%	16%
Clark	0.18	0.13	0.18	0.22	25%	7%
Clay	0.60	0.60	0.60	0.53	-11%	-4%
Cleburne	0.20	0.20	0.31	0.31	60%	16%
Cleveland	0.00	0.00	0.00	0.00	-	-
Columbia	0.38	0.33	0.33	0.29	-22%	-8%
Conway	0.05	0.19	0.24	0.28	500%	60%
Craighead	0.40	0.46	0.60	0.68	71%	18%
Crawford	0.13	0.15	0.18	0.18	38%	11%
Crittenden	0.34	0.36	0.40	0.44	29%	9%
Cross	0.35	0.41	0.41	0.35	0%	0%
Dallas	0.13	0.26	0.39	0.39	200%	37%
Desha	0.41	0.49	0.41	0.41	0%	0%
Drew	0.05	0.16	0.16	0.21	300%	46%
Faulkner	0.22	0.26	0.28	0.32	50%	14%
Franklin	0.06	0.06	0.06	0.06	0%	0%
Fulton	0.58	0.58	0.58	0.66	14%	4%
Garland	0.51	0.60	0.61	0.64	24%	7%
Grant	0.11	0.22	0.22	0.22	100%	23%
Greene	0.50	0.50	0.43	0.50	0%	0%
Hempstead	0.22	0.22	0.22	0.22	0%	0%
Hot Spring	0.21	0.15	0.18	0.24	14%	4%
Howard	0.07	0.07	0.07	0.07	0%	0%
Independence	0.32	0.46	0.43	0.57	75%	19%
Izard	0.22	0.22	0.37	0.37	67%	17%
Jackson	0.23	0.23	0.29	0.34	50%	14%
Jefferson	0.22	0.24	0.28	0.30	38%	11%
Johnson	0.19	0.27	0.31	0.31	60%	16%
Lafayette	0.28	0.56	0.42	0.42	50%	14%
Lawrence	0.12	0.12	0.18	0.24	100%	23%

	NPs per 1000 Pop				2010-2013	
County Name	2010	2011	2012	2013	%Change	Annual Growth Rate
State: Arkansas	**0.33**	**0.37**	**0.40**	**0.44**	**34%**	**10%**
Lee	0.10	0.10	0.10	0.00	-100%	-
Lincoln	0.00	0.00	0.00	0.00	-	-
Little River	0.08	0.08	0.16	0.40	400%	54%
Logan	0.27	0.27	0.27	0.27	0%	0%
Lonoke	0.11	0.10	0.13	0.11	0%	0%
Madison	0.06	0.06	0.13	0.19	200%	37%
Marion	0.18	0.18	0.18	0.18	0%	0%
Miller	0.30	0.37	0.39	0.41	38%	11%
Mississippi	0.18	0.23	0.16	0.23	25%	7%
Monroe	0.40	0.53	0.53	0.40	0%	0%
Montgomery	0.11	0.11	0.22	0.22	100%	23%
Nevada	0.23	0.23	0.23	0.23	0%	0%
Newton	0.51	0.51	0.63	0.63	25%	7%
Ouachita	0.08	0.08	0.08	0.08	0%	0%
Perry	0.00	0.10	0.10	0.10	-	-
Phillips	0.50	0.55	0.55	0.65	30%	9%
Pike	0.36	0.27	0.27	0.36	0%	0%
Poinsett	0.25	0.29	0.41	0.45	83%	20%
Polk	0.30	0.49	0.54	0.49	67%	17%
Pope	0.19	0.21	0.25	0.28	50%	14%
Prairie	0.60	0.72	0.48	0.60	0%	0%
Pulaski	0.76	0.84	0.91	1.03	35%	10%
Randolph	0.23	0.23	0.17	0.17	-25%	-10%
St. Francis	0.26	0.22	0.26	0.30	14%	4%
Saline	0.10	0.10	0.13	0.16	58%	15%
Scott	0.09	0.09	0.09	0.19	100%	23%
Searcy	0.50	0.38	0.38	0.50	0%	0%
Sebastian	0.29	0.33	0.34	0.39	35%	10%
Sevier	0.11	0.06	0.17	0.11	0%	0%
Sharp	0.35	0.35	0.35	0.41	17%	5%
Stone	0.08	0.08	0.08	0.08	0%	0%
Union	0.35	0.40	0.45	0.50	43%	12%
Van Buren	0.42	0.36	0.59	0.65	57%	15%
Washington	0.44	0.46	0.45	0.48	9%	3%
White	0.25	0.28	0.31	0.28	10%	3%
Woodruff	0.43	0.58	0.58	1.01	133%	28%
Yell	0.09	0.14	0.18	0.14	50%	14%

Source: Area Health Resources Files (AHRF), from the US Department of Health and Human Services' Health Resources and Services Administration.

Appendix C:
Relevant Arkansas Code

Collaborative Practice: **ACA § 17-87-102(2)** states that a "collaborative practice agreement" means a written plan that identifies a physician who agrees to collaborate with an advanced practice nurse in the joint management of the health care of the advanced practice nurse's patients, and outlines procedures for consultation with or referral to the collaborating physician or other health care professionals as indicated by a patient's health care needs;

ACA § 17-87-310(c) states: "A collaborative practice agreement shall include, but not be limited to, provisions addressing:

> "(a) The Arkansas State Board of Nursing may grant a certificate of prescriptive authority to an advanced practice registered nurse who:
>
> Prior to July 2015:
>
> **2) Has a collaborative practice agreement with a practicing physician who is licensed under the Arkansas Medical Practices Act, §§ 17-95-201 – 17-95-207, 17-95-301 – 17-95-305, and 17-95-401 – 17-95-411, and who has training in scope, specialty, or expertise to that of the advanced practice registered nurse on file with the Board.**
>
> 1. The availability of the collaborating physician for consultation or referral, or both;
> 2. Methods of management of the collaborative practice, which shall include protocols for prescriptive authority;
> 3. Coverage of the health care needs of a patient in the emergency absence of the advanced practice nurse or physician; and
> 4. Quality assurance."

Prescriptive Authority: **ACA § 17-87-310(a)(2)** provides that: "An advanced practice nurse may obtain a certificate of prescriptive authority from the Arkansas State Board of Nursing if the advanced practice nurse has a collaborative practice agreement with a physician who is licensed under the Arkansas Medical Practices Act, and who has a practice comparable in scope, specialty, or expertise to that of the advanced practice nurse on file with the Arkansas State Board of Nursing."

> "(a) The Arkansas State Board of Nursing may grant a certificate of prescriptive authority to an advanced practice registered nurse who:
>
> (1) Submits proof of successful completion of a board-approved advanced pharmacology course that shall include preceptorial experience in the prescription of drugs, medicines, and therapeutic devices; and
>
> (2) Has a collaborative practice agreement with a physician who is licensed under the Arkansas Medical Practices Act, § 17-95-201 et seq., § 17-95-301 et seq., and § 17-95-401 et seq., and who has a practice comparable in scope, specialty, or expertise to that of the advanced practice registered nurse on file with the Arkansas State Board of Nursing.
>
> (b) (1) An advanced practice registered

nurse with a certificate of prescriptive authority may receive and prescribe drugs, medicines, or therapeutic devices appropriate to the advanced practice registered nurse's area of practice in accordance with rules established by the Arkansas State Board of Nursing.

(2) An advanced practice registered nurse's prescriptive authority shall only extend to drugs listed in Schedules III--V.[1]

(c) A collaborative practice agreement shall include, but not be limited to, provisions addressing:

(1) The availability of the collaborating physician for consultation or referral, or both;

(2) Methods of management of the collaborative practice, which shall include protocols for prescriptive authority;

(3) Coverage of the health care needs of a patient in the emergency absence of the advanced practice registered nurse or physician; and

(4) Quality assurance."

1 The FDA rescheduled hydrocodone combinations from schedule II to schedule III in 2014. In Arkansas, nurse practitioners may prescribe schedule II hydrocodone combinations if the collaborative practice agreement expressly allows it.

Appendix D:
Our Statistical Model

To investigate the effect of expanded scope of practice on Arkansas's ability to attract more nurse practitioners, we estimated a multivariate regression model using all 50 states. We scored each state based on the ability of nurse practitioners to (1) refer to specialists, (2) work without a collaborative practice agreement, (3) work without specific physician involvement, and (4) prescribe schedule II–V drugs. We scored each state from 1 to 4 using equal weighting.[1] Using ordinary least squares (OLS), we accounted for per capita real gross state product, percent of the population below the federal poverty level, and percent of the population living in rural areas.

1 Results were robust to scoring measures that did not weight each value equally.

OLS Model

$$NPs\ per\ 100k\ pop = \beta_0 + \beta_1\ Score + \beta_2\%\ Rural + \beta_3\%\ Poverty + \beta_4\ per\ capita\ real\ GDP + \varepsilon$$

We found that increasing a state's score by one point (improving any one of the scope of practice rules) would lead to 1.23 additional NPs per state. Thus, expanding scope of practice would increase the number of nurse practitioners in Arkansas by 3.69 nurse practitioners per 100,000 population.

We find that collaborative practice agreements, followed by limits on prescriptive authority, are the most burdensome.

David "Mitch" Mitchell earned his B.S. and M.A. in Economics from Clemson University and was awarded his Ph.D. from George Mason University. Mitchell's research interests include state level public finance, and entrepreneurship policy. He has published in the *Journal of Economic Education*, the *Cato Journal*, *Forbes*, and the *Southern Economic Journal*.

Zack Helms was an undergraduate student at the University of Central Arkansas when this paper was written. Since then Helms worked as an analyst at Memorial Sloan Kettering in New York. He is currently doing health policy reform in Copenhagen.

Jordan Pfaff was an undergraduate student at the University of Central Arkansas when this paper was written. Since then Pfaff completed his masters degree in data analytics at NC State and currently works as a data scientist at Cognizant Technology Solutions.

Arkansas Center for Research in Economics
University of Central Arkansas
College of Business
210 Donaghey Avenue
Conway, Arkansas 72035

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