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# **Primary Care and Nurse Practitioners in Arkansas**

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## Executive Summary

Like the rest of the country, Arkansas faces a growing shortage of primary health care providers. One of the most promising approaches to alleviating this shortage is to expand the use of nurse practitioners. Nurse practitioners are trained to provide primary care and research shows to be as effective as physicians in providing primary care. Although 21 states currently allow nurse practitioners full practice to provide primary care, Arkansas regulations restrict nurse practitioner's ability to practice independently diminishing nurse practitioners' ability to meet Arkansans' primary care needs. Because nurse practitioners are more likely to work in rural areas where primary care needs are most acute and where primary care has been shown to stem the rising obesity and diabetes epidemics, unnecessarily restricting nurse practitioners generates tremendous costs for Arkansans' medical spending and health. This

policy brief examines access to primary care in Arkansas, current restrictions on the use of nurse practitioners, and the magnitude of diabetes-related costs in the state that could be alleviated by expanding nurse practitioners' scope of practice.

# Introduction

Nationwide, policy makers and medical professionals are concerned by the looming shortage of primary care physicians.<sup>1</sup> This shortage is attributed to many factors, ranging from shifting demographics toward an older population to fewer medical students choosing primary care, instead favoring more lucrative specialties.<sup>2</sup> Moreover, the demand for primary care is expected to exceed the available supply by more than 10 percent in some areas because of the increase in coverage provided through the Affordable Care Act.<sup>3</sup> Problems caused by the shortage are exacerbated by the unequal distribution of primary care physicians—especially in poor and rural communities.<sup>4</sup>

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,<sup>5</sup> with considerable variation in primary care access among Arkansas's counties. Counties with the least access to primary care—such as those along the Mississippi Delta—often face difficult population health issues such as obesity and diabetes that greater access to primary care can improve.<sup>6</sup>

Among the various solutions proposed to address the shortage of primary care providers, the most promising is the increased use of nurse practitioners.<sup>7</sup> Nurse practitioners are nurses who have obtained a master's degree in nursing science or a doctorate in nursing practice. These graduate degrees require both advanced coursework and considerable clinical hours. Like physicians, nurse practitioners can pursue many specialties in which to practice, but many choose primary care.

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<sup>1</sup> 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), *AAMC Physician Workforce Policy Recommendations* (Washington, DC: AAMC, September 2012).

<sup>2</sup> 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, "U.S. Graduate Medical Education and Physician Specialty Choice," *Academic Medicine* 88, no. 4 (2013): 468–74.

<sup>3</sup> E. S. Huang and K. Finegold, "Seven Million Americans Live in Areas Where Demand for Primary Care May Exceed Supply by More Than 10 Percent," *Health Affairs* 32, no. 3 (2013): 614–21.

<sup>4</sup> S. M. Patterson et al., "Unequal Distribution of the U.S. Primary Care Workforce," *American Family Physician* 87, no. 11 (2013).

<sup>5</sup> Advisory Board, "The 10 States Facing the Biggest Physician Shortages," *The Daily Briefing*, October 22, 2012, accessed May 26, 2016, <https://www.advisory.com/Daily-Briefing/2012/10/22/The-10-states-facing-the-biggest-physician-shortages>.

<sup>6</sup> 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.

<sup>7</sup> J. K. Iglehart, "Expanding the Role of Advanced Nurse Practitioners—Risks and Rewards," *New England Journal of Medicine* 368, no. 20: (2013): 1935–41.

# Access to Primary Care

Currently, 21 states and the District of Columbia allow nurse practitioners full practice authority to evaluate patients, diagnose conditions, order and interpret tests, manage treatments, and prescribe medicine.<sup>8</sup> However, Arkansas state law and agency policies place needless limits on nurse practitioners, especially as it relates to the authority to write prescriptions, the ability to be reimbursed, by public and private insurers, and to practice without physician supervision. If Arkansas permitted nurse practitioners to practice with greater authority, they could provide needed primary care to more Arkansans.

This policy brief examines this important issue. First, it describes the current state of access to primary care in Arkansas. Then, it discusses the regulation of nurse practitioners and the barriers they face to practicing primary care in the state. Finally, it explores the incidence of diabetes within Arkansas as an example of the type and magnitude of health problems that could be addressed by increasing access to primary care through expanding nurse practitioners' scope of practice.

To assess the current status of primary care in Arkansas, we performed two different analyses. First, we examined county-level data from the Area Health Resources Files (AHRF) produced by the Health Resources and Services Administration, a division of the US Department of Health and Human Services. The AHRF compiles aggregate data at the county, state, and national levels from multiple sources such as the American Medical Association, American Hospital Association, and US census into a single database to support health care research. We used these data to investigate the availability of primary care physicians at the county level. We also utilized individual medical claims data from the Centers for Medicare and Medicaid Services (CMS) to better understand access to care by the elderly population, a growing demographic responsible for much of the recent increase in health care costs.

## Area Health Resource File Analysis:

Using AHRF data, we calculated the number of primary care physicians (PCP) per 1,000 population in each Arkansas county from 2010 through 2013 (see appendix A). In 2013, there were 0.65 PCPs per 1,000

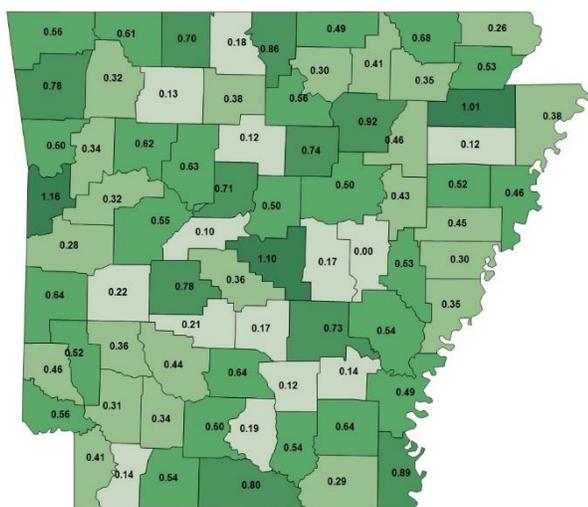
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<sup>8</sup> American Association of Nurse Practitioners, "State Practice Environment," accessed May 26, 2016,

<https://www.aanp.org/legislation-regulation/state-legislation/state-practice-environment>.

Arkansans (or 1 PCP per 1,547 people). Figure 1 displays the PCP-to-population ratio. There is considerable variation by county, with more physicians available to serve the population in the urban areas in central, northwest, and northeast Arkansas.

**Figure 1. Number of Primary Care Physicians per 1,000 Population**



Source: Area Health Resources Files 2013.

Statewide, the ratio of PCPs to population grew by 2 percent per year from 2010 through 2013 (see appendix A). However, there was considerable variation between counties, with 22 counties experiencing a decrease in PCPs per population over this period. The most severe drop occurred in rural Newton County, which saw a 50 percent decline in the number of PCPs per population.

#### Medicare Claims Analysis:

The increased demand for primary care services is often attributed to a growing elderly population.<sup>9</sup> To assess Arkansas’s ability to meet the elderly’s medical needs with its primary care workforce, we examined

administrative claims data from the 2013 CMS 5 percent random sample research identifiable files (RIF), which contain all fee-for-service claims associated with a 5 percent national sample of Medicare beneficiaries. We identified all physician services performed on beneficiaries that resided 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 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 neighboring states (see table 1).

<sup>9</sup> R. L. Phillips, “Effectiveness over Efficiency.”

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

State	Arkansas Patient Services by Physician's State: Total patients and percent		Arkansas Physician Services by Patient's State: Total services and percent	
	Arkansas	946,285	81	946,285
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	57,803	5	16,739	2
Others				
<b>Total</b>	<b>1,166,456</b>	<b>100%</b>	<b>1,007,175</b>	<b>100%</b>

Source: Center for Medicare and Medicaid Services, 2013.

As table 1 shows, almost one out of five (19 percent) Arkansas Medicare patients received care outside of Arkansas. It is

possible that these patients simply lived near a state border and traveled to the closest suitable provider. However, we find that 94 percent of Medicare patients who saw Arkansas physicians were from within Arkansas. Thus, if Arkansas physicians had provided all of their Medicare services in 2013 to patients from Arkansas, then Arkansas physicians still would not have met 14 percent of the demand for Medicare services required by elderly Arkansas residents.<sup>10</sup> Unless Arkansas physicians have extra capacity for additional appointments, they would have to substitute their more lucrative commercially insured patient appointments with Medicare patients to meet this need. In light of this shortage, it is likely that a substantial number of elderly Arkansans must to leave the state to seek medical care.

primary care. In Arkansas, however, regulations constrain their ability to practice independently. The FTC pointed out that

these scope of practice regulations appear to be based on patient safety, but often extend towards protectionism. Reducing the regulatory burden and increasing nurse practitioners' scope of practice would alleviate some problems in Arkansas and would help attract nurse practitioners to Arkansas.

**Scope of Practice:**

Scope of practice refers to a medical provider's legal authority to perform specific procedures, such as referring patients to a specialist, prescribing medicine, and ordering diagnostic tests. The American Association of Nurse Practitioners (AANP) groups states into three categories according the scope of practice available to nurse practitioners in each state (see figure 2).

## Nurse Practitioners

A type of Advanced Practice Registered Nurses (APRN), nurse practitioners provide

<sup>10</sup> Percentage calculated as follows:  $1,166,456 - 1,007,175 / 1,166,456$ .



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.<sup>11</sup>

(c) A collaborative practice agreement shall include, but not

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<sup>11</sup> 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 with the physician expressly allows it.

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.

#### Regulation:

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.<sup>12</sup> However, a considerable body of research indicates that nurse practitioners

provide comparable quality to physicians for primary care patients,<sup>13</sup> culminating with a 2011 Institute of Medicine report recommending that advanced nurse practitioners be free to practice to the full extent of their training. Based on this research and the experience of nurse practitioners in states that allow full practice, the National Governors Association has recommended that states provide full practice to nurse practitioners to help alleviate the growing primary care shortage.<sup>14</sup>

Although regulations are often implemented to safeguard the public, sometimes regulations do more harm than good. Excessive regulation may not generate meaningful protections while creating barriers that curb competition. In the case of nurse practitioners, these barriers restrict the services that nurse practitioners may provide.<sup>15</sup> The barriers create several problems:

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<sup>12</sup> Iglehart, "Expanding the Role of Advanced Nurse Practitioners."

<sup>13</sup> 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, 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. Munding 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.

<sup>14</sup> National Governors Association, "The Role of Nurse Practitioners in Meeting Increasing Demand for Primary Care," December 20, 2012, accessed May 26, 2016, <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>.

<sup>15</sup> M. M. Kleiner et al., "Relaxing Occupational Licensing Requirements: Analyzing Wages and Prices for a Medical Service"

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

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

Thus, even well-meaning regulations may not be effective when considering their overall effect. The trick is to *balance protection with competition*, which often starts with a focus on the overall *outcomes* of a regulation rather than the *inputs*. In light of these concerns, the Federal Trade Commission examined state regulations of advanced practice nurses and concluded that

these regulations frequently exceed what is necessary to protect consumers.<sup>16</sup>

#### Advantages of Expanding Nurse Practitioners' Scope of Practice

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

**Improved Access in Underserved Areas:** Nurse practitioners are much more likely to practice in rural and underserved areas than physicians are.<sup>17</sup>

**Innovation:** The increased use of nurse practitioners is likely to spur innovation in health care delivery. For example, advanced practice nurse-staffed clinics generally offer weekend and evening hours, unlike most primary care physicians. This schedule not only provides greater flexibility for patients, but also provides competitive incentives for other types of clinics to offer extended hours as well.<sup>18</sup>

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(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* 364, no. 3 (2011): 193–96.

<sup>16</sup> M. M. Kleiner et al., "Relaxing Occupational Licensing Requirements"; Pittman and Williams, "Physician Wages"; Fairman et al., "Broadening the Scope of Nursing Practice."

<sup>17</sup> Federal Trade Commission (FTC), *Policy Perspectives: Competition and the Regulation of Advanced Practice Nurses* (Washington, DC: FTC, 2014); K.

Grumbach et al., "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 (2013): 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.

<sup>18</sup> Massachusetts Department of Public Health, "Commonwealth to Propose Regulations for Limited Service Clinics: Rules May Promote Convenience, Greater Access to Care," press release, July 17, 2007.

**Greater Physician Focus:** Although nurse practitioners receive excellent training for primary care, they are not replacements for physicians. According to the Institute of Medicine,<sup>19</sup> the expansion of nursing scopes of practice has not diminished the critical role of physicians in patient care nor has it reduced physician 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.<sup>20</sup>

#### Attracting Nurse Practitioners to Arkansas

Given that 21 other states currently allow full practice for nurse practitioners, will Arkansas be able to attract sufficient numbers to alleviate the primary care shortage if regulators expand nursing's scope of practice? A cursory examination indicates that this outcome is likely. Although Arkansas's average salary for nurse practitioners (\$93,870) is lower than the national average (\$101,260),<sup>21</sup> it is comparable to that of Arkansas's neighboring

states—all of which have similar or more restrictive regulations for nurse practitioners' scope of practice (see figure 2). If Arkansas allowed full practice, greater practice opportunities should lure advanced practice nurses from neighboring states. Arkansas's relatively low cost of living may entice nurse practitioners currently enjoying full practice elsewhere. Moreover, full practice opportunities may incentivize current registered nurses in Arkansas to pursue advanced training given an average salary differential of \$37,000.<sup>22</sup> Using AHRF data, we estimate that the number of nurse practitioners has grown by 10 percent per year from 2010 through 2013 (appendix B), indicating that Arkansas is competitive in this market.<sup>23</sup>

To investigate the effect of expanding advanced practice nurses' 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 patients to

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<sup>19</sup> Institute of Medicine, *The Future of Nursing: Leading Change, Advancing Health* (Washington, DC: National Academies Press, 2011).

<sup>20</sup> 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): 101–7.

<sup>21</sup> US Department of Labor, Bureau of Labor Statistics, "Occupational Employment and Wages, May 2014, 29-1171 Nurse Practitioners," accessed May 24, 2015, <http://www.bls.gov/oes/current/oes291171.htm>.

<sup>22</sup> US Department of Labor, Bureau of Labor Statistics, "Occupational Employment and Wages, May 2014, 29-1171 Nurse Practitioners," accessed May 24, 2015, <http://www.bls.gov/oes/current/oes291171.htm>.

<sup>23</sup> Many of Arkansas's nearby neighbors have proposed legislation allowing full practice authority for nurse practitioners.

specialists, (2) work without a collaborative practice agreement, (3) work without any other specific physician involvement, and (4) prescribe schedule II–V drugs. We scored each state from one to four using equal weighting.<sup>24</sup> Higher scores imply Using ordinary least squares (OLS), we accounted for per capita real gross state product, the percent of the population with income below the poverty level, and the percent of the population living in rural areas. 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 nurse practitioners per state. Thus, expanding the scope of practice would increase the number of nurse practitioners in Arkansas by 3.69 per

Arkansas has high incidence of diabetes which is unequally distributed geographically. Uncontrolled diabetes is expensive for payers and patients. Diabetic patients need primary care.<sup>25-26</sup> Diabetic patients, including those with complications and comorbidities, have excellent outcomes when cared for by nurse practitioners.

#### Incidence of Diabetes in Arkansas

According to the Centers for Disease Control and Prevention (CDC), 9.3 percent of the US population has diabetes, costing society \$176 billion annually in medical spending and another \$69 billion in indirect costs from disability, missed work, and premature death.<sup>27</sup> Arkansas is no different from the nation as a whole. Using data from the CDC’s 2010 Behavioral Risk Factor Surveillance System, 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, 9.6 percent of Arkansas’s population has been diagnosed with diabetes. However, there is considerable variation at the county level (see figure 3).

## Diabetes: A Primary Care Problem

100,000.

#### OLS Model

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

<sup>24</sup> Results were robust to scoring measures that did not weight each value equally.

<sup>25</sup> Saaristo, T., Moilanen, L., Korpi-Hyövälti, E., Vanhala, M., Saltevo, J., Niskanen, L., ... & Uusitupa, M. (2010). Lifestyle intervention for prevention of type 2 diabetes in primary health care one-year follow-up of the Finnish National Diabetes Prevention Program (FIN-D2D). *Diabetes care*, 33(10), 2146-2151.

<sup>26</sup> Whittemore, R., Melkus, G., Wagner, J., Northrup, V., Dziura, J., & Grey, M. (2009). Translating the diabetes prevention program to primary care: a pilot study. *Nursing research*, 58(1), 2.

<sup>27</sup> 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).



- spend an average of 12 minutes face-to-face with patients as opposed to an average of 7 minutes for primary care physicians;

- are more likely to provide and document diabetes education in patient encounters; and

- demonstrate increased patient communication and follow-up care.

Even if nurse practitioners perform no better than physicians in managing diabetes patients, simply increasing access to primary care services for these patients—who are frequently concentrated in the Arkansas’s most underserved areas—by using unrestricted nurse practitioners would generate substantial cost savings in diabetes care.

## Conclusion

Like the rest of the country, Arkansas faces a growing shortage of primary health care providers. This shortage affects both the quality and cost of Arkansans’ care. Nurse practitioners can mitigate this shortage, and 21 other states have granted full practice authority to nurse practitioners to meet their primary care needs.

Decreasing overregulation and allowing nurse practitioners to practice to the full extent of their capabilities would increase primary care access across the state, particularly in underserved areas, by attracting more nurse practitioners to the state and by incentivizing current nurses to seek advanced training. Health care costs would fall as increased primary care reduces hospitalizations and improves the management of chronic diseases such as diabetes. Consumers would have greater choice among settings where care is provided. Arkansas physicians could focus on high-value complex care and could benefit from fewer administrative costs for managing nurse practitioners as required by current regulations.<sup>28</sup>

Regulations are almost always passed with the best intentions. However, in this case, current regulations are harming Arkansans’ health. A small change in occupational regulation could save lives and improve the health and financial well-being of all Arkansans.

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<sup>28</sup> For a widely accepted definition of value in health care where outcomes are divided by costs, see M. E. Porter,

“What Is Value in Health Care?” *New England Journal of Medicine* 363, no. 26 (2010): 2477–81.

# Appendix

## Appendix A. Access to Primary Care Physicians (PCPs) in Arkansas by County

Year	NPs per 1,000 Pop.				2010–2013		Year	NPs per 1,000 Pop.				2010–2013	
	2010	2011	2012	2013	% Change	% Annual Growth Rate		2010	2011	2012	2013	% Change	% Annual Growth Rate
<b>State Average</b>	<b>0.61</b>	<b>0.62</b>	<b>0.64</b>	<b>0.65</b>	<b>6</b>	<b>2</b>	<b>State Average</b>	<b>0.61</b>	<b>0.62</b>	<b>0.64</b>	<b>0.65</b>	<b>6</b>	<b>2</b>
<b>County</b>							<b>County</b>						
Arkansas	0.54	0.48	0.54	0.54	0	0	Lee	0.30	0.30	0.30	0.30	0	—
Ashley	0.38	0.33	0.29	0.29	-25	-10	Lincoln	0.07	0.07	0.07	0.14	—	—
Baxter	0.76	0.93	0.83	0.86	13	4	Little River	0.56	0.48	0.56	0.56	0	0
Benton	0.50	0.52	0.54	0.56	12	4	Logan	0.32	0.36	0.27	0.32	0	0
Boone	0.75	0.70	0.70	0.70	-7	-2	Lonoke	0.17	0.17	0.18	0.17	0	0
Bradley	0.54	0.45	0.54	0.54	0	0	Madison	0.19	0.19	0.19	0.32	67	17
Calhoun	0.19	0.19	0.19	0.19	0	0	Marion	0.18	0.24	0.31	0.18	0	0
Carroll	0.58	0.58	0.65	0.61	6	2	Miller	0.30	0.23	0.28	0.41	38	11
Chicot	0.98	0.98	0.89	0.89	-9	-3	Mississippi	0.41	0.41	0.41	0.38	-6	-2
Clark	0.62	0.53	0.49	0.44	-29	-11	Monroe	0.53	0.40	0.53	0.53	0	0
Clay	0.26	0.33	0.33	0.26	0	0	Montgomery	0.11	0.22	0.22	0.22	100	23
Cleburne	0.59	0.66	0.70	0.74	27	8	Nevada	0.34	0.34	0.34	0.34	0	0
Cleveland	0.12	0.12	0.12	0.12	—	—	Newton	0.25	0.25	0.13	0.13	-50	-23
Columbia	0.54	0.54	0.54	0.54	0	0	Ouachita	0.52	0.56	0.56	0.60	15	5
Conway	0.66	0.76	0.71	0.71	7	2	Perry	0.10	0.20	0.10	0.10	—	—
Craighead	0.95	0.94	0.98	1.01	7	2	Phillips	0.35	0.35	0.35	0.35	0	0
Crawford	0.49	0.49	0.49	0.50	3	1	Pike	0.45	0.36	0.36	0.36	-20	-7
Crittenden	0.44	0.48	0.44	0.46	5	1	Poinsett	0.21	0.21	0.16	0.12	-40	-17
Cross	0.46	0.46	0.46	0.52	13	4	Polk	0.54	0.54	0.54	0.64	18	6
Dallas	0.64	0.64	0.64	0.64	0	0	Pope	0.62	0.62	0.66	0.63	3	1
Desha	0.49	0.57	0.57	0.49	0	0	Prairie	0.00	0.00	0.00	0.00	0	0
Drew	0.48	0.48	0.64	0.64	33	10	Pulaski	1.00	1.06	1.07	1.10	10	3
Faulkner	0.45	0.45	0.49	0.50	11	4	Randolph	0.63	0.57	0.57	0.68	9	3
Franklin	0.28	0.28	0.34	0.34	20	6	St. Francis	0.37	0.41	0.45	0.45	20	6
Fulton	0.74	0.58	0.58	0.49	-33	-14	Saline	0.37	0.36	0.37	0.36	-2	-1
Garland	0.70	0.74	0.76	0.78	12	4	Scott	0.19	0.19	0.28	0.28	50	14
Grant	0.17	0.17	0.17	0.17	0	0	Searcy	0.50	0.50	0.38	0.38	-25	-10
Greene	0.55	0.57	0.53	0.53	-4	-1	Sebastian	1.14	1.14	1.14	1.16	2	1
Hempstead	0.27	0.31	0.31	0.31	17	5	Sevier	0.52	0.57	0.46	0.46	-11	-4
Hot Spring	0.24	0.24	0.24	0.21	-13	-4	Sharp	0.53	0.47	0.41	0.41	-22	-8
Howard	0.52	0.52	0.52	0.52	0	0	Stone	0.56	0.56	0.48	0.56	0	0
Independence	0.87	0.87	1.00	0.92	6	2	Union	0.82	0.77	0.92	0.80	-3	-1
Izard	0.30	0.15	0.30	0.30	0	0	Van Buren	0.18	0.12	0.12	0.12	-33	-14
Jackson	0.46	0.46	0.51	0.46	0	0	Washington	0.66	0.71	0.77	0.78	18	6
Jefferson	0.83	0.84	0.76	0.73	-12	-4	White	0.51	0.48	0.47	0.50	-3	-1
Johnson	0.69	0.65	0.62	0.62	-11	-4	Woodruff	0.43	0.43	0.43	0.43	0	0
Lafayette	0.28	0.28	0.14	0.14	-50	-23	Yell	0.59	0.46	0.50	0.55	-8	-3
Lawrence	0.35	0.35	0.35	0.35	0	0							

# About the Authors

## Appendix B. Access to Nurse Practitioners (NPs) in Arkansas by County

### Appendix B. Access to Nurse Practitioners (NPs) in Arkansas by County

NPs per 1,000 Pop.					2010–2013	
Year	2010	2011	2012	2013	% Change	% Annual Growth Rate
<b>State Average</b>	<b>0.33</b>	<b>0.37</b>	<b>0.40</b>	<b>0.44</b>	<b>34</b>	<b>10</b>
<b>County</b>						
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 1,000 Pop.					2010–2013	
Year	2010	2011	2012	2013	% Change	% Annual Growth Rate
<b>State Average</b>	<b>0.33</b>	<b>0.37</b>	<b>0.40</b>	<b>0.44</b>	<b>34</b>	<b>10</b>
<b>County</b>						
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

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## About ACRE

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