

# Full Practice Authority for Nurse Practitioners Increases Access and Controls Cost

2014



## Acknowledgements

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## The Business Case for Utilizing Clinicians Effectively

The United States' health care system is experiencing an unprecedented expansion of coverage. The passage of the Affordable Care Act coupled with the aging of our population will test capacity like never before while costs continue to rise past one-fifth of Gross Domestic Product. Consumers are beginning to report difficulties with access and businesses continue struggle with rising insurance premiums. This comes at a time when the supply of primary care clinicians is falling and just two percent of medical students express a desire to practice as general internists.<sup>1</sup>

This report seeks to examine nurse practitioners' role in expanding access to and improving the quality of care, thereby helping to address this surge in demand controlling health care costs for businesses and consumers. Nurse practitioners are the analytical focus of the report due to the amount of academic research that has been focused on this specific discipline. Its results speak, though, to the importance of using all advance practice health professionals to the full extent of their training. This includes, in particular, all advance practice nurses as well as physician assistants.

What is the scope of this increase in demand? Researchers estimate that the nation's current supply of primary care clinicians will need to grow by an additional 2.5 percent in 2014 alone. And pockets of the nation will see a substantially larger increase in demand. Over 40 million Americans live in areas expected to see an increase greater than 5 percent and seven million live in areas forecasted to see more than a 10 percent increase.<sup>2</sup> The Association of American Medical Colleges expects there to be 65,000 too few primary care physicians nationwide by 2025.<sup>3</sup> If demand grows without a concurrent increase in supply of clinicians or efficiency of the delivery system, instead of bending the cost curve for businesses down, it will spike up again as the nation recovers from the economic recession of 2008.

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<sup>1</sup> *Changes in Medical Students' Views of Internal Medicine Careers From 1990 to 2007*, Mark D. Schwartz, Steven Durning, Mark Linzer, and Karen E. Hauer, JAMA Internal Medicine, 2011

<sup>2</sup> *Seven Million Americans Live In Areas Where Demand For Primary Care May Exceed Supply By More Than 10 Percent*, Elbert S. Huang and Kenneth Finegold, Health Affairs, 2013

<sup>3</sup> *The Impact of Health Care Reform on the Future Supply and Demand for Physicians Updated Projections Through 2025*, Association of American Medical Colleges, 2012

A variety of factors have contributed to the shortage of highly trained health clinicians. Primary care physicians work long hours, receive low reimbursement, and must navigate a maze of paperwork on a daily basis. General practitioners are a cornerstone of the health care system and finding solutions to these problems is critical, but so too is utilizing all health personnel to the full extent of their education and training. One way to do so is to fully utilize the role of nurse practitioners – a profession developed specifically in response to physician shortages of the 1960s.

*Simply put: an inefficient delivery system that unnecessarily restricts health professionals from practicing to the full extent of their training is bad for the economy and bad for business.*

Nurse practitioners are educated and trained to provide a range of primary, acute, and specialty health care services. However states determine the extent to which nurse practitioners can practice to the full extent of this education and training. Oftentimes state policies impose undue restrictions on nurse practitioners. The Federal Trade Commission has recommended states take caution when considering proposals to limit the practice authority of nurse practitioners, citing evidence of a reduction in both competition and benefits to consumers that result from such laws.<sup>4</sup> Simply put: an inefficient delivery system that unnecessarily restricts health care professionals from practicing to the full extent of their training is bad for the economy and bad for business.

This report provides a framework to quantify the effects that allowing nurse practitioners to practice to the full extent of their education and training would have on the delivery system at the state level. It focuses on three dimensions where current academic research shows full practice authority is likely to have a significant effect: access, quality, and cost. An application of this framework to California, for example, shows that removing barriers for nurse practitioners would increase the supply of individuals practicing in the profession by 24 percent, while providing 2 million more preventative care visits per year and saving \$1.8 billion on preventative care visits alone over the first ten years. Analyses for other states show that similar results hold across the nation.

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<sup>4</sup> *Policy Perspectives: Competition and the Regulation of Advance Practice Nurses*, Federal Trade Commission, 2014

While controlling costs for businesses and expanding access for the workforce is essential, it cannot come at the expenses of quality care. Nurse practitioners and other advance practice health professionals provide care at a high level of quality. In years following increased nurse practitioner authority in a given state, adults report a 13-15 percent increase in visit quality, while children report gains of 17-27 percent. There is also a strong desire within the profession to practice primary care, a survey by the Health Resources and Services Administration found 47 percent of recent graduates from nurse practitioner programs opted to work in primary care.

With the Affordable Care Act expanding coverage for millions of Americans over the next several years, increasing the supply of primary care available is essential. It is difficult, however, to rapidly increase the number of primary care practitioners, especially primary care physicians and advanced practice nurses. Therefore, immediate term access and affordability challenges must be addressed through utilizing health personnel more effectively and efficiently. There is substantial evidence to suggest that this is consistent with comparable if not improved health care quality and health outcomes as well as cost savings that will help businesses with their immediate healthcare cost pressures and position them to thrive in the global economy.

## Nurse Practitioner's History and Current Practice

One of the main challenges as businesses and other purchasers struggle with addressing rising healthcare costs and ensuring access to high quality healthcare for their workforces and their families is understanding the intensely and increasingly complex health system. Unlike many other consumer goods, there will always be enormous challenges in gauging the quality of health services received since the outcomes of health care are necessarily uncertain and technology is advancing rapidly. Most business leaders would be hard pressed to differentiate the roles of registered nurses from nurse practitioners or, for that matter, physicians from physicians' assistants.

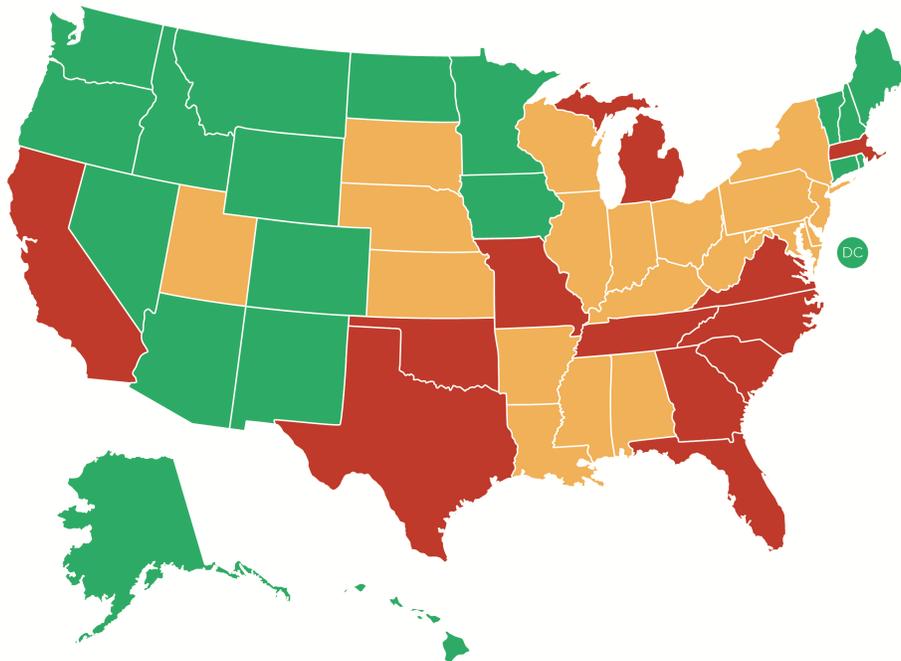
The following section lays out some of the history of the profession of nurse practitioner as well as its role in the modern day delivery system to provide critical context for the rest of the report. One key issue is that state laws vary dramatically in terms of the extent to which nurse practitioners are able to practice to the full extent of their training. The map on the following page displays these differences. States marked in green are considered to have full practice authority, defined as "licensure laws provide for 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 of the state board of nursing." Those in yellow and red have reduced or restrictive practice environments, with state practice or licensure laws that restrict one or more elements of practice as well as requirements for nurse practitioners to sign collaboration agreements or be supervised by a physician.

*Reports by the Institute of Medicine, National Governors Association, and others have recommended increasing the supply of nurse practitioners and allowing them to practice to the full extent of their education.*

One of the reasons for this variation is that nurse practitioners are a relatively new profession. The discipline came into prominence in the 1960s as a response to a scarcity of physicians. The first nurse practitioner program was developed at the University of Colorado by Dr. Loretta Ford and Dr. Henry Silver in 1965. By the 1980s, more than 200 nurse practitioner programs were offered

and over 15,000 nurse practitioners were practicing.<sup>5</sup> In 1986, the United States Office of Technology Assessment examined care and practice patterns of nurse practitioners and concluded they performed as well as physicians in all areas of primary care delivery and health outcomes. In recent years, reports by the Institute of Medicine, National Governors Association, and others have recommended increasing the supply of nurse practitioners and allowing them to practice to the full extent of their education.

### Nurse Practitioner State Practice Environment - 2014



- **FULL PRACTICE**  
 State practice and licensure laws provide for 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 laws reduce the ability of nurse practitioners to engage in at least one element of NP practice. State requires a regulated collaborative agreement with an outside health discipline in order for the NP to provide patient care.
- **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

<sup>5</sup> American Association of Nurse Practitioners

There are four main types of Advance Practice Registered Nurses including Certified Nurse-Midwives (CNMs), Certified Registered Nurse Anesthetists (CRNAs), Clinical Nurse Specialists (CNSs), and Nurse Practitioners (NPs). While each profession is its own specialty and has its own history, all four types of advance practice nurses require a graduate-level education and are prepared with advanced didactic and clinical education. This education separates advance practice nurses from registered nurses by providing the necessary skills to diagnose patients and develop treatment strategies. While similar, the graduate education of advance practice nurses differs from that of medical doctors by focusing from the start on the practical delivery of health care— while medical school programs continue a heavy basic science component from prerequisites into the early years of training. Many students begin graduate programs with one or more years of nursing experience.

In 2012 nurse practitioners made up 72.5 percent of all advance practice nurses issued National Provider Identifiers by the Centers for Medicare & Medicaid Services.<sup>6</sup> Like all advance practice nurses, nurse practitioners must complete graduate-level education and oftentimes hold the practice-focused doctoral degree, Doctor of Nursing Practice (DNP). In response to the changing health care landscape and increasing demand for the highest level of practice expertise, the American Association of Colleges of Nursing has recommended that all entry-level nurse practitioner educational programs transition to the Doctor of Nursing Practice by 2015.<sup>7</sup> In addition, the Institute of Medicine has recommended the implementation of nurse residency programs upon completion of an advance practice degree program to further clinical expertise.<sup>8</sup>

With a high level of education and training, nurse practitioners operate in a variety of settings and specialties. They work in both in-patient and out-patient settings and can practice either primary or specialty care. Although most frequently nurse practitioners practice primary care in outpatient settings where they perform nearly all the functions a primary care physician would, nurse practitioners are trained to provide a full range of primary, acute, and specialty health care services, including ordering and interpreting diagnostic tests such as lab work and x-rays, diagnosing and treating acute and chronic conditions, prescribing medications, and counseling and educating patients on disease

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<sup>6</sup> Not all clinicians hold a National Provider Identifier; see Appendix.

<sup>7</sup> *Position Statement on the Practice Doctorate in Nursing*, American Association of Colleges of Nursing, 2004

<sup>8</sup> *The Future of Nursing: Leading Change, Advancing Health*, Institute of Medicine, 2010

prevention and healthy life choices. Some nurse practitioners work in collaborative settings with physicians and some work independent of a physician. This depends in part on the state they practice in since states have very different laws that govern nurse practice. Like physicians, nurse practitioners are trained to consult a physician or specialist when appropriate.

*With a high level of education and training, nurse practitioners operate in a variety of settings and specialties.*

While many nurse practitioners practice primary care, some are also pioneering roles in specialty care practices. Nurse practitioners have increased access and improved quality in several high demand areas including orthopedics, gastroenterology, and dermatology.<sup>9</sup> As is the case with primary care, specialty care must adapt to uphold quality while remaining financially sustainable.

The scope of activities a nurse practitioner can practice – regulated by the state in which they are licensed – is often widely debated by the medical community, patients, and policymakers. As documented in the map above, 19 states and the District of Columbia permit nurse practitioners to practice to the full extent of their training and education. The remaining 31 states have either reduced or restricted practice environments, unduly limiting nurse practitioners in the areas of patient care and the prescription of medications. In early 2014 the Federal Trade Commission recommended states take caution when considering proposals to limit the practice authority of nurse practitioners, citing evidence of a reduction in both competition and benefits to consumers that result from such laws.<sup>10</sup> In the state of California, nurse practitioners cannot diagnose, treat patients or prescribe medications without a signed collaborative practice agreement and Standardized Procedures.

*Granting full practice authority to nurse practitioners will help control healthcare costs for businesses and other consumers while helping to ensure high quality care for their workforces and their families.*

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<sup>9</sup> *Physicians Assistants and Nurse Practitioners: Six practices Make it Work*, Catherine Dower, Sharon Christian, California HealthCare Foundation, 2009

<sup>10</sup> *Policy Perspectives: Competition and the Regulation of Advance Practice Nurses*, Federal Trade Commission, 2014

A growing body of evidence exists that shows properly trained advance practice nurses provide primary care equal to that of physicians with outcomes to match.<sup>1112</sup> Due to the prevalence of nurse practitioners and the wide patient population they serve, a significant proportion of existing research focuses on nurse practitioners, making this analysis possible. The implication of these studies and the conclusion of this report is that granting full practice authority to nurse practitioners will help control healthcare costs for businesses and other consumers while helping to ensure high quality care for their workforces and their families.

This is a policy change that is long overdue in those states that still need to modernize their laws governing the practice of highly-trained health professionals. Fortunately, more states across the nation are making these changes every year. Changes to state law, however, are necessary but not sufficient to ensure that businesses and other purchasers get the best value for their health spending and patients get the highest quality healthcare. The report concludes with a series of policy recommendations that extend to broader patterns of practice and reimbursement that are necessary to reinforce this policy change.

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<sup>11</sup> A Meta-Analysis of Nurse Practitioners and Nurse Midwives in Primary Care, Sharon Brown and Deanna Grimes, Nursing Research, 1995

<sup>12</sup> Primary Care Outcomes in Patients Treated by Nurse Practitioners or Physicians, A Randomized Trial, Mary Munding et al., JAMA, 2000

## Data and Methodology

This report translates peer-reviewed academic research to provide a framework for business leaders and policymakers to quantify the effects that allowing nurse practitioners to practice to the full extent of their education and training would have on the delivery system at the state level. The state of California is the case study and example in the body of the report, but the methodology allows the analysis to be expanded to other states that have yet to grant nurse practitioners full practice authority. Several of these states' results are included in this report in separate sections below.

The analysis focuses on three dimensions where current academic research shows full practice authority is likely to have a significant effect: access, quality, and cost. It quantifies the impacts to one area of care, preventive care visits, as a result of expanding the scope of only one profession. It is also important to note that results and estimations do not account for the expansion of coverage being brought on by the ACA. They are therefore a conservative estimate of the extent to which this policy reform would address a pressing social need and have positive human and economic consequences. It is also important to note that the findings here are savings and improvements that accrue to the entire population of each state rather than to governments or to businesses exclusively. Saving money in one part of the healthcare sector alone tends to shift those costs to other payers for healthcare. Governments spending too little on state Medicaid programs increase the costs that businesses pay for healthcare for their employees.<sup>13</sup> It is only through improving quality and access for the entire system that we can get the best value for health spending for all purchasers.

## Limitations

The estimations presented here have several limitations. First, because the objective of this analysis was to translate peer-reviewed academic research, it is important to note that each of the studies relied upon have their own set of limitations. The authors' assumptions, choice of data, and quantitative methods all have an effect on the results. Each of these studies has been extensively peer-reviewed and chosen for publication in well-respected outlets.

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<sup>13</sup> Hospitals Respond To Medicare Payment Shortfalls By Both Shifting Costs And Cutting Them, Based on Market Concentration, James Robinson, Health Affairs, 2011

Furthermore, each of the authors was contacted to better understand the full scope of limitations and opportunities for improvement before moving forward.

Second, this analysis relies on estimations for national averages in several instances that would ideally be replaced with state specific estimations. This is due a dearth of state-level data on health care and health insurance. State-level estimations are possible with the Medical Expenditure Panel Survey, however state-level data is suppressed and access highly restricted. Because the objective of this analysis was to provide broad, conservative estimates of the impact to one area of care national estimates were deemed appropriate.

Finally, the estimations presented here are the result of applying regression coefficients from cross-sectional analyses to individual states. They therefore reflect the average expected change in the state when everything else is held constant. While a state's health care landscape is not likely to be or remain static, particularly as the nation moves forward in the implementation of health reform, the application of these coefficients is an accepted and widely used research method for examining policy changes.

## Increasing Access to Care

California is the most populous state in the nation. It has also been a leader among states in the implementation of federal health reform. Its diverse population and equally diverse landscape mean delivery systems must adapt accordingly to meet the coming surge in demand for health services. By virtue of its size, California is home to the largest number of primary care physicians and nurse practitioners of any state. However, in 2011, the state ranked 23<sup>rd</sup> in the number of primary care physicians per 100,000 residents.<sup>14</sup> With the state's covered population set to rise substantially, the supply of primary care clinicians is likely to become strained even further.

The supply of nurse practitioners has increased since the profession's inception in the 1960s, and most substantially in the past two decades. There are now 150,000 nurse practitioners licensed to practice nationwide, compared to an estimated 260,000 primary care physicians.<sup>15</sup> The number of nurse practitioners

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<sup>14</sup> Bay Area Council Economic Institute analysis of the Area Health Resource File (AHRF)

<sup>15</sup> *How does provider supply and regulation influence health care markets? Evidence from nurse practitioners and physician assistants*, Kevin Stange, *Journal of Health Economics*, 2013

in California has seen a dramatic rise in the past decade, more than doubling from 8,240 in 2004 to over 17,000 in 2008. In 1993 nurse practitioners represented 2.2 percent of all registered nurses in California. By 2012 their share grew to 5.6 percent.<sup>16</sup> A 2013 report by the Health Resources and Services Administration estimated that the supply of nurse practitioners would continue to grow, increasing 30 percent by 2020.

### *Nurse practitioners serve a diverse and historically underserved population.*

Along with accounting for a rising share of primary care clinicians, research suggests nurse practitioners serve a diverse and historically underserved population. An analysis by DesRoches et al. of 2008 Medicare administrative data found nurse practitioners were more likely than physicians to serve younger, more often female, and less frequently white beneficiaries. They were also much more likely to serve individuals with a disability and the vulnerable populations that are dually eligible for Medicare and Medicaid. Furthermore, the counties in which nurse practitioners practiced were more likely to be in either rural or a Health Professional Shortage Areas (HPSAs), critical targets for increasing access.<sup>17</sup>

A separate examination provides patient confirmation of DesRoches et al.'s finding. Traczynski and Udalova's analysis of Medical Expenditure Panel Survey (MEPS) data finds that after granting full practice authority for nurse practitioners, reported satisfaction in both appointment availability and ease of traveling to appointments rises significantly. Adults see a 16-20 percent increase in both measures of satisfaction, while children see gains of 17-35 percent respectively. Nurse practitioners receive extensive patient-centric training which may help to explain why patients of nurse practitioners report higher satisfaction with care received when compared to physicians. In the years following practice authority reform adults report a 13-15 percent increase in visit quality, while children report gains of 17-27 percent.<sup>18</sup>

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<sup>16</sup> *2012 Survey of Registered Nurses*, California Board of Registered Nursing, 2013

<sup>17</sup> *Using Medicare data to assess nurse practitioner-provided care*, Catherine M. DesRoches, Jennifer Gaudet, Jennifer Perloff, Karen Donelan, Lisa Iezzoni, Peter Buerhaus, *Nursing Outlook*, 2013

<sup>18</sup> *Nurse Practitioner Independence, Health Care Utilization, and Health Outcomes* Jeffrey Traczynski and Victoria Udalova, working paper, 2013

A comparison of California’s nurse practitioners and physicians yields similar results. **Table 1** contains an analysis of the Area Health Resource File (AHRF) issued by the Department of Health and Human Services. Nurse practitioners in California practiced at much lower rates than primary care physicians both on average as well as in urban counties. This dynamic is reversed for rural counties, though, where nurse practitioners practiced at higher rates than physicians. Furthermore, while both nurse practitioners and physicians are less concentrated in designated HPSAs, the concentration of nurse practitioners per 100,000 residents is just slightly below the county average, compared to the concentration of physicians that is much lower than the county average.

**Table 1**

Clinicians per 100,000 Residents in California in 2011			
	Primary Care Physicians	Nurse Practitioners	Total
County Average	67	52	119
Urban-County Average	74	47	121
Rural-County Average	55	62	117
HPSA-County Average	59	50	109

Note: Rural and Urban county designations were made using the U.S. Department of Agriculture Rural-Urban Continuum Codes see Resources section for details. Health Professional Shortage Area (HPSA) county designations are made each year by the U.S. Department Health & Human Services.

Data Source: 2012-2013 Area Health Resource File

Analysis: Bay Area Council Economic Institute

## Measuring the Effect of Full Practice Authority on Access

To estimate the effect that might result from practice authority reform in California, we have applied results from an analysis by Patricia Reagan and Pamela Salsberry.<sup>19</sup> Reagan and Salsberry conducted a cross-section analysis of Health Service Areas<sup>20</sup> (HSAs) using data from the AHRF and 2008 Pearson Report to examine the labor market for nurse practitioners. Health Service Areas in states with the most restrictive practice regulations were found to have nearly

<sup>19</sup> *The effects of state-level scope-of-practice regulations on the number and growth of nurse practitioners*, Patricia Reagan and Pamela Salsberry, Nursing Outlook, 2013

<sup>20</sup> See Resources section for a description of Health Service Areas

11 fewer nurse practitioners per 100,000 residents than HSAs in states with no restrictions.

Nurse practitioners receive broad training overlapping in many areas with that of physicians. Because of this, the labor markets for the two professions are interrelated to a significant extent. Reagan and Salsberry give careful consideration to how the price of either type of clinician shifts the demand curve for the other. In addition to an unknown substitution effect, occupational restrictions placed on nurse practitioners means the market for their services is imperfectly competitive. Assuming that physicians and nurse practitioners are substitutes to some extent and taking into consideration the significant restrictions placed on nurse practitioners, the authors hypothesized that HSAs in states with restrictive practice regulations would have a reduced number of nurse practitioners.

*Nurse practitioners receive broad training overlapping in many areas with that of physicians. Because of this, the labor markets for the two professions are interrelated to a significant extent.*

Reagan and Salsberry's analysis relies on data on the number of nurse practitioners, physicians, and population characteristics for 2001 and 2008 from the AHRF aggregated into HSAs from individual counties. Measures practice regulations come from the 2008 Pearson Report and categorized based on the methodology of Fairman et al.<sup>21</sup> The resulting sample of HSAs included 90 percent of the U.S. population for 2008. A regression analysis uses the change in number of nurse practitioners from 2001 to 2008 as the dependent variable, with independent variables for practice regulations, census regions, per capita number primary care physicians, per capita number of specialty care physicians, poverty level, population density, share of the population without health coverage and share of the population over age 65. A second regression analysis was performed with the growth rate of nurse practitioners as the dependent variable and using the same independent variables.

Reagan and Salsberry's analysis found that HSAs in states with any form practice restrictions had fewer nurse practitioners per capita than HSAs in states without restrictions. The analysis also showed HSAs in states with practice restrictions to

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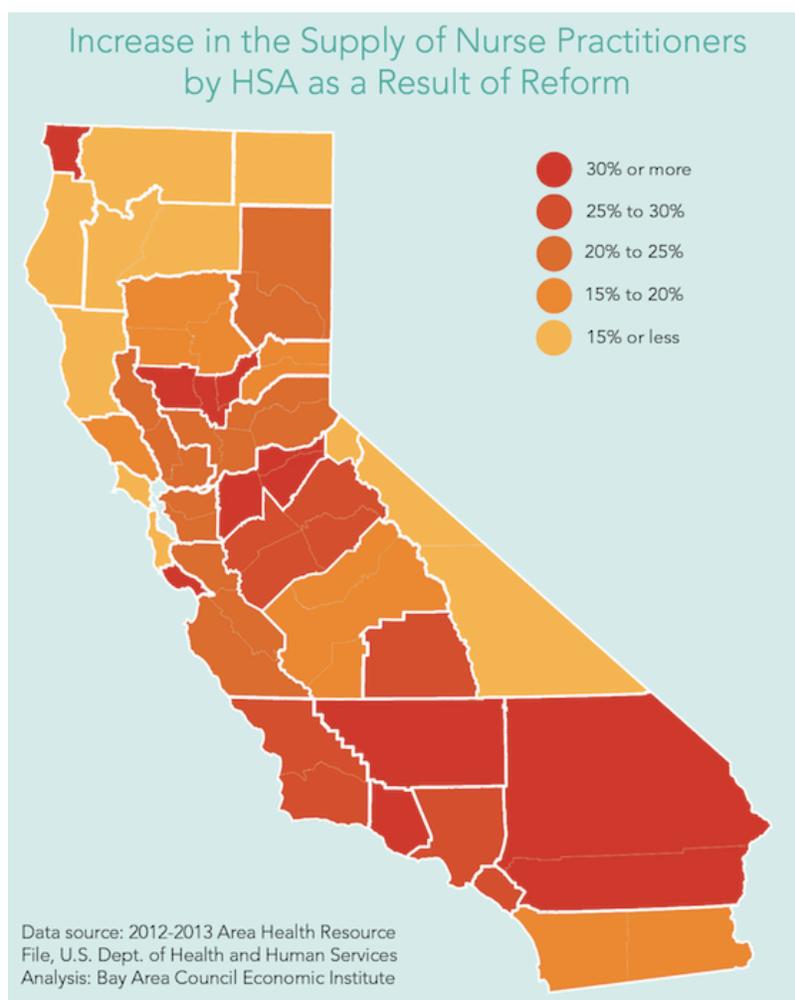
<sup>21</sup> *Broadening the scope of nursing practice* Julie Fairman, John Rowe, Susan Hassmiller, Donna Shalala, The New England Journal of Medicine, 2011

have a 25 percent lower growth rate of nurse practitioners than in states without restrictions. Regional effects had no impact on the results when controlling for population characteristics. Furthermore, the coefficient on primary care physicians was negative and the coefficient on specialty care physicians was positive, indicating a basis for assuming nurse practitioners and physicians are substitutes in certain environments.

These results allow for an estimation of the additional supply of nurse practitioners states might have had practice authority reform been enacted previously. An analysis of the AHRF for 2011 – the most recent year available – shows that California HSAs had on average 54 nurse practitioners per 100,000 residents. By applying the coefficients from Reagan and Salsberry’s results to the county level data contained in the AHRF we develop an estimate of increase in supply that would result from practice restrictions being lifted in the state as shown in **Figure 1**.

Using 2011 gives us up to date an estimate of how nurse practitioners are distributed as possible. It also means results are inherently conservative due to Reagan and Salsberry’s analysis stopping at 2008. With each passing year states that continue to have restrictive practice regulations fall behind in the number of nurse practitioners working in that state. Had California’s practice restrictions for nurse practitioners been lifted, HSAs in the state would have had an average of 66 nurse practitioners per 100,000 residents in 2011, a 22 percent increase on average. Additionally, the growth rate of nurse practitioners in the state would also increase by 25 percent, providing much needed relief to the state’s health care workforce in future years.

**Figure 1**



## Increasing the Quality of Healthcare

Demand for health care services is likely to outstrip supply in post health reform California. Therefore, an increase in the number of access points of primary care clinicians would likely address pent-up demand, resulting in increased utilization of health care services for both existing covered and newly covered populations. But how will it affect the quality of care delivered? Evidence shows that the quality of care delivered by nurse practitioners in primary care settings are as high as that provided by physicians.<sup>222324</sup> Nurse practitioners performed as high

<sup>22</sup> A Meta-Analysis of Nurse Practitioners and Nurse Midwives in Primary Care, Sharon Brown and Deanna Grimes, Nursing Research, 1995

as physicians in areas such as: health outcomes, patient compliance with treatments, patient satisfaction, resolution of conditions, patient risk, and neonatal outcomes.

*Evidence shows that the quality of care delivered by nurse practitioners in primary care settings are as high as that provided by physicians.*

This report focuses on the role of preventive care in high quality care. It applies results from a methodology developed by Jeffrey Traczynski and Victoria Udalova. Using the confidential version of the Medical Expenditure Panel Survey (MEPS), and exploiting the variation in timing of practice reform laws in various states, they find an increase in the frequency of routine checkups, the preventive care that is key to preserving the health of the workforce and the broader population.

Traczynski and Udalova (2013) first construct a set of data containing practice regulations for nurse practitioners by state from 1970 to 2010. They then take individual level data on utilization from MEPS, in this case the probability that an individual has had a routine checkup in the previous 12 months, and look for differences in short and long run effects of practice authority reform. They do this by using an event study approach to examine the effect on utilization and outcomes. Age, race, health insurance status, ethnicity, gender, whether or not an individual lives in an urban area, employment status, marital status, education and income are controlled for. The resulting analysis finds statistically significant increases in both the short and long run effects on utilization for adults. No increase is found for individuals under the age of 18.

To extrapolate what an increase of this magnitude would mean for California, we apply the national probability that an individual has had a routine checkup in the last 12 months to California's adult population. Using the confidential version of MEPS would allow a California specific estimate of this probability, however there are significant barriers to working with these data and gains in the level of precision are likely to be small. The entire population of California is used rather

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<sup>23</sup> Primary Care Outcomes in Patients Treated by Nurse Practitioners or Physicians, A Randomized Trial, Mary Munding et al., JAMA, 2000

<sup>24</sup> *Advanced Practice Nurse Outcomes 1990-2008: A Systematic Review*, Robin Newhouse et al., Nursing Economics, 2011

than the covered population because health insurance status was controlled for in the initial analysis. Finally, the short and long run effects are applied to California’s adult and child populations to estimate the increase in utilization post practice authority reform.

**Table 2** shows what the increase in utilization would like look for California.

**Table 2**

Yearly Adult Preventative Care Visits in California in 2012				
	Present	Years 1-2 Following Reform	After Year 10 Following Reform	Increase
Individuals 18 and over:				
Preventative Care Visit in the Past 12 Months	66.0%	70.0%	72.8%	10.3%
Number of Visits Yearly	19,008,799	20,149,327	20,967,282	+1,958,483

Note: California’s population was estimated at 38,041,430 for 2012. The population 18 years and over was 28,801,211; the population under 18 years was 9,240,219  
 Data Source: U.S. Census Bureau, Annual Estimates of the Resident Population, 2012  
 Analysis: Bay Area Council Economic Institute

## Controlling Costs for All Purchasers of Healthcare

Practice restrictions placed on nurse practitioners increase the price of health services through artificially limiting supply. Practice authority reform will enable nurse practitioners to operate at their full potential, therefore increasing both access and utilization as discussed in previous sections. This analysis examines the change in the total number of practicing nurse practitioners statewide, as well as the resulting effects from increased capacity of existing nurse practitioners. This increase in supply will have an effect on prices as well as access and utilization.

To examine the effects practice authority reform will have on prices for a medical service in California, we adapt a methodology developed by Kleiner, et al.<sup>25</sup>

<sup>25</sup> *Relaxing Occupational Licensing Requirements: Analyzing Wages and Prices for a Medical Service* Morris M. Kleiner, Allison Marier, Kyoung Won Park, Coady Wing, NBER Working Paper No. 19906, 2014

Using a database of private insurance claims maintained by Fair Health, Inc., the authors examine the price of well child visits from 2005 to 2010. In the case of well child visits, the services of a nurse practitioner are widely seen as a substitute for the services of a physician, and vice versa. Because of this, the authors are able to examine the effect practice authority has on prices where nurse practitioner substitution is considered the norm.

*Practice restrictions placed on nurse practitioners increase the price of health services through artificially limiting supply.*

The Fair Health database contained nearly 30 million well child visits from across the nation for 2005 through 2010. The average price reimbursed across the eight Current Procedural Terminology (CPT) codes analyzed by the authors was \$96.59. By modeling the price of well child visits by state by year, the practice laws in each state, and various state and year fixed effects, the authors are able to estimate the effect on price for two scenarios. They find prices for a well child visit are almost \$7 higher in states that require direct supervision of nurse practitioners but allow some prescriptive authority, and over \$16 higher in states that require direct supervision and allow no prescriptive authority.

**Table 3**

Average Price of a Preventative Care Visit			
State NP Regulations:	Supervision Requirements and no Prescriptive Authority	Supervision Requirements and Limited Prescriptive Authority	No Supervision Requirements and Full Prescriptive Authority
Price of a Preventative Care Visit	\$113.02	\$103.24	\$96.59

Source: *Relaxing Occupational Licensing Requirements: Analyzing Wages and Prices for a Medical Service* Morris M. Kleiner, Allison Marier, Kyoung Won Park, Coady Wing, NBER Working Paper No. 19906, 2014

To quantify what effect the decrease in primary care visit prices would have on California, the assumption is made that a well child visit is interchangeable with an adult preventative care visit. This assumption is made on the basis that adult preventative care visits, like well child exams, are the standard method through which adults receive primary, preventative care. Nurse practitioners and physicians are both trained and qualified to provide each service, and are

essentially substitutes for each other in the marketplace. Next, since California grants nurse practitioners limited prescriptive authority – and therefore falls into the second scenario analyzed – the decrease in price found by the authors was \$6.65 per visit. Finally, the decrease in price of each preventative care visit is paired with the increase in the number of total visits following practice authority reform.

*Nurse practitioners and physicians are both trained and qualified to provide each service, and are essentially substitutes for each other in the marketplace.*

**Table 2** shows the treatment effect in both the short and long term, however Traczynski and Udalova also calculate the treatment effect for two-year intervals up to year 10, allowing for the calculation of aggregate effects in the first 10 years. By applying the increase in the number of preventative care visits for each of these intervals and the decrease in the price for a preventative care visit we can estimate the result for California. **Table 4** illustrates these effects following the granting of full practice authority to nurse practitioners in California. The cost savings related to preventative care visits alone are sizable and research suggests full practice authority would result in large cost reductions of other preventative care services as well. It is estimated that allowing nurse practitioners full practice authority nationwide would save \$810 million per year in retail clinic settings alone.<sup>26</sup>

**Table 4**

Cost Savings on Preventative Care Visits in California			
	Year 1	Years 1-10	Year 11+
Additional Visits (000s)	1,141	14,366	1,958
Yearly Savings (000s)	\$175,777	\$1,777,462	\$181,217

Note: Baseline number of preventative care visits includes both adults and children, and are based on 2012 U.S. Census Bureau state population estimates. Estimates for subsequent years do not account for population growth.

Data Source: U.S. Census Bureau

Analysis: Bay Area Council Economic Institute

<sup>26</sup> *Scope-Of-Practice Laws For Nurse Practitioners Limit Cost Savings That Can Be Achieved In Retail Clinics*, Joanne Spetz, Stephen Parente, Robert Town, Dawn Bazarko, Health Affairs, 2013

*The true impacts to businesses and other purchasers of making these types of policy changes are likely to be much greater.*

This analysis is only suggestive of the potential effects on rising healthcare costs of granting full practice authority to nurse practitioners. It focuses on only one area, preventive care visits, and calculates the impact of expanding the scope of only one profession. We chose this area since it has a well-established reservoir of academic research. But more analyses continue to be published that suggest that utilizing all health professionals to the full extent of their training is an essential step to controlling healthcare costs and getting better value for health spending.

The true impacts to businesses and other purchasers of making these types of policy changes are likely to be much greater. But policy change is incremental and there is a robust public debate around the expansion of these laws. Therefore, our focus here is to provide the most conservative analysis possible to build consensus around these changes. Business leaders and policymakers must partner with all members of the health profession to make policy and purchasing changes in this area that keep patient care at the center of our reforms while making the system vastly more efficient. This is not only possible but essential.

## Policy Recommendations

States that have not yet done so should modernize their laws to ensure that all health professionals are practicing to the full extent of their training. Granting full practice authority to nurse practitioners – and indeed to all advance practice nurses – is a significant step toward increasing access, improving quality, and controlling the costs of health care. However, this step on its own is not a panacea. As health care reform continues to move forward so too should the evolution of the health care workforce ensuring patients have access to affordable, high quality services. Business leaders and other major purchasers of healthcare have an essential role in this conversation.

### Grant Full Practice Authority to Nurse Practitioners

States still imposing practice restrictions on nurse practitioners should remove these barriers and allow these highly trained health care professionals to practice to the full extent of their training and education. Incremental steps may be necessary to move states along the continuum towards full practice but the ultimate goal is full practice within guidelines of training and certification with no artificial restrictions that hinder access to care for patients or drive up healthcare costs for businesses and other purchasers.

### Remove Other Regulatory Barriers to Practice and Care

Removing restrictive practice regulations at the state-level is an important and significant first step. However, various federal regulations also hinder nurse practitioners from practicing to the full extent of their abilities and stifle innovation.

*Various federal regulations also hinder nurse practitioners from practicing to the full extent of their abilities and stifle innovation.*

Examples include barriers for nurse practitioners to serve as primary care clinicians in state Medicaid programs due to provisions in the Balanced Budget Act of 1997, and the exclusion of nurse practitioners as primary care clinicians under the Medicare Shared Savings Program. This program and other “Accountable Care Organization” programs require an efficient delivery system in order to be successful. These efficient delivery systems have many hallmarks

including the effective use of information technology and information exchange and positive financial incentives. Personnel practices, though, are the linchpin of making accountable care work.

### Continue to Advance the Education of our Health Care Workforce

With the shortage of primary care clinicians only increasing, it is essential to continue to train more primary care physicians and more advance practice nurses. Programs like the Medicare Graduate Nurse Education Demonstration are providing financial support to the education of advance practice nurses for the first time, and should be carefully observed and expanded.

### Ensure Financial Incentives Support Quality Care

In the late 1990s changes to the Social Security Act allowed nurse practitioners to bill Medicare directly at 85 percent of that of physicians. Since then evidence has confirmed care delivered by nurse practitioners is of equal quality to that of physicians and by some measures better. Nurse practitioners should receive full reimbursement for care they deliver in both collaborative and independent settings. Doing so would increase the supply of primary care clinicians and lower costs for consumers regardless of their clinician of choice. This move would also decrease the incentive to practice “incident to” billing and provide a clearer picture of the care provided by nurse practitioners across the country.

### Extend Hospital Privileges for Nurse Practitioners

Nurse practitioners are beginning to account for a rising share of primary care clinicians, a trend that will only increase as practice restrictions are lifted. In order to maintain continuity of care for their patients nurse practitioners must be allowed to follow their patients in the event they are admitted to the hospital. Various federal, state, and individual hospital regulations currently prevent access for many patients’ when their clinician of choice is a nurse practitioner.

## Conclusion

The debate around the appropriate role for each clinician within the healthcare delivery system is one that must be approached with care and a respect for all of the professionals who operate within the system. We must also address, however, the urgent needs to expand access to healthcare and to control rising

healthcare costs for businesses and other purchasers of healthcare. A wealth of in-depth academic research, translated here, shows that granting full practice authority to nurse practitioners is one of the most effective ways to control healthcare costs while increasing access and preserving or improving quality. States that have yet to modernize their laws regarding nurse practice would be wise to do so, and business leaders and other healthcare purchasers should play a leading role in this conversation.

## Spotlight: California

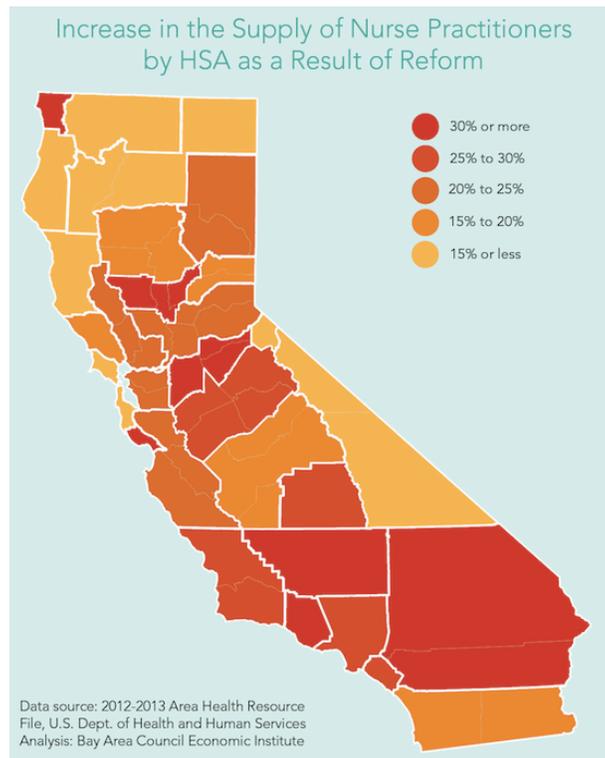
### Access

Clinicians per 100,000 Residents in California in 2011			
	Primary Care Physicians	Nurse Practitioners	Total
County Average	67	52	119
Urban-County Average	74	47	121
Rural-County Average	55	62	117
HPSA-County Average	59	50	109

Note: Rural and Urban county designations were made using the U.S. Department of Agriculture Rural-Urban Continuum Codes see Resources section for details. Health Professional Shortage Area (HPSA) county designations are made each year by the U.S. Department Health & Human Services.

Data Source: 2012-2013 Area Health Resource File

Analysis: Bay Area Council Economic Institute



Nurse Practitioners per 100,000 Residents by HSA in California				
HSA	Counties	2011	Post-Reform	Increase
690	Colusa, Sutter, Yuba	35	46	31%
697	Butte, Glenn, Tehama	66	77	16%
701	Alpine	0	-	-
709	El Dorado, Placer, Sacramento, Yolo	48	59	23%
710	Modoc, Shasta, Trinity	80	91	14%
718	Fresno, Kings, Madera	58	69	19%
723	Los Angeles	40	50	28%
737	Mariposa, Merced, Stanislaus, Tuolumne	39	50	28%
738	Del Norte	33	44	33%
746	Lake, Napa, Solano	52	63	21%
750	Amador, Calaveras, San Joaquin	30	41	36%
751	Monterey, San Benito, Santa Clara	46	57	23%
752	Siskiyou	85	96	13%
753	Nevada, Sierra	65	76	17%
757	San Francisco, San Mateo	92	103	12%
764	Marin	83	94	13%
766	Alameda, Contra Costa	48	59	23%
768	Riverside, San Bernardino	29	40	37%
774	Imperial, San Diego	58	69	19%
780	Lassen, Plumas	46	57	24%
781	San Luis Obispo, Santa Barbara	43	54	26%
789	Tulare	39	50	28%
790	Ventura	29	40	38%
800	Humbolt	97	108	11%
802	Santa Cruz	32	43	35%
807	Kern	34	45	32%
811	Mendocino	95	106	11%
816	Inyo, Mono	98	109	11%
833	Orange	36	47	30%
834	Sonoma	68	79	16%

Data Source: 2012-2013 Area Health Resource File  
 Analysis: Bay Area Council Economic Institute

## Quality

Yearly Adult Preventative Care Visits in California in 2012				
	Present	Years 1-2 Following Reform	After Year 10 Following Reform	Increase
Individuals 18 and over:				
Preventative Care Visit in the Past 12 Months	66.0%	70.0%	72.8%	10.3%
Number of Visits Yearly	19,008,799	20,149,327	20,967,282	+1,958,483

Note: California's population was estimated at 38,041,430 for 2012. The population 18 years and over was 28,801,211; the population under 18 years was 9,240,219

Data Source: U.S. Census Bureau, Annual Estimates of the Resident Population, 2012

Analysis: Bay Area Council Economic Institute

## Cost

Cost Savings on Preventative Care Visits in California			
	Year 1	Years 1-10	Year 11+
Additional Visits (000s)	1,141	14,366	1,958
Yearly Savings (000s)	\$175,777	\$1,777,462	\$181,217

Note: Baseline number of preventative care visits includes both adults and children, and are based on 2012 U.S. Census Bureau state population estimates. Estimates for subsequent years do not account for population growth.

Data Source: U.S. Census Bureau

Analysis: Bay Area Council Economic Institute

## Spotlight: Kentucky

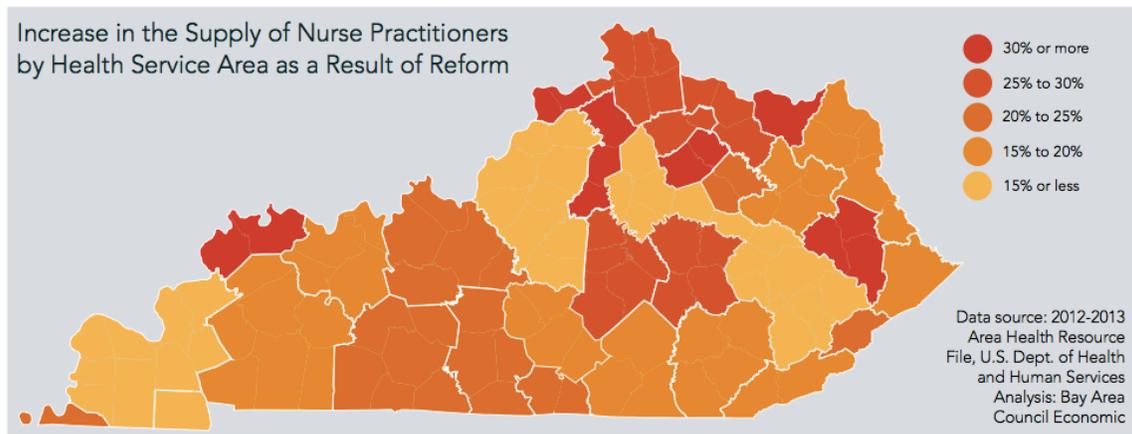
### Access

Clinicians per 100,000 Residents in Kentucky in 2011			
	Primary Care Physicians	Nurse Practitioners	Total
County Average	44	50	94
Urban-County Average	48	43	91
Rural-County Average	42	52	94
HPSA-County Average	32	49	81

Note: Rural and Urban county designations were made using the U.S. Department of Agriculture Rural-Urban Continuum Codes see Resources section for details. Health Professional Shortage Area (HPSA) county designations are made each year by the U.S. Department Health & Human Services.

Data Source: 2012-2013 Area Health Resource File

Analysis: Bay Area Council Economic Institute



Nurse Practitioners per 100,000 Residents by HSA in Kentucky				
HSA	Counties	2011	Post-Reform	Increase
2	Boone, Campbell, Gallatin, Grant, Kenton, Pendleton	40	52	30%
11	Floyd, Johnson, Magoffin	38	50	32%
13	Pike	69	81	17%
18	Breathitt, Clark, Fayette, Jessamine, Knott, Lee, Leslie, Owsley, Perry, Powell, Scott, Wolfe, Woodford	92	104	13%
27	Boyle, Casey, Garrard, Lincoln, Mercer	46	58	26%
29	Allen, Butler, Edmonson, Logan, Simpson, Warren	53	65	23%
37	McCreary, Pulaski, Wayne	69	81	17%
40	Henderson, Union	32	44	37%
45	Caldwell, Christian, Hopkins, Muhlenberg, Todd, Trigg, Webster	66	78	18%
46	Boyd, Carter, Greenup, Lawrence, Martin	65	77	18%
51	Clay, Knox, Laurel, Whitley	79	91	15%
53	Barren, Hart, Metcalfe, Monroe	53	65	22%
62	Estill, Jackson, Madison, Rockcastle	41	53	29%
67	Elliott, Menifee, Morgan, Rowan	75	87	16%
82	Adair, Green, Russell, Taylor	71	83	17%
89	Breckinridge, Grayson, Hardin, Larue, Meade	57	69	21%
96	Bell, Harlan	60	72	20%

Data Source: 2012-2013 Area Health Resource File  
 Analysis: Bay Area Council Economic Institute

Nurse Practitioners per 100,000 Residents by HSA in Kentucky (Cont.)				
HSA	Counties	2011	Post-Reform	Increase
102	Bourbon, Nicholas	18	30	65%
104	Clinton, Cumberland	51	63	23%
114	Anderson, Franklin, Owen	38	50	31%
115	Calloway	99	111	12%
116	Bracken, Fleming, Mason	46	58	26%
119	Harrison, Robertson	47	59	25%
123	Letcher	51	63	23%
131	Bath, Montgomery	48	60	25%
181	Fulton	55	67	22%
272	Bullitt, Henry, Jefferson, Marion, Nelson, Oldham, Shelby, Spencer, Washington	85	97	14%
337	Lewis	27	39	44%
855	Ballard, Carlisle, Crittenden, Graves, Hickman, Livingston, Lyon, Marshall, McCracken	82	94	15%
913	Daviess, Hancock, McLean, Ohio	67	79	18%
914	Carroll, Trimble	38	50	32%

Data Source: 2012-2013 Area Health Resource File  
 Analysis: Bay Area Council Economic Institute

## Quality

Yearly Adult Preventative Care Visits in Kentucky in 2012				
	Present	Years 1-2 Following Reform	After Year 10 Following Reform	Increase
Individuals 18 and over:				
Preventative Care Visit in the Past 12 Months	66.0%	70.0%	72.8%	10.3%
Number of Visits Yearly	2,219,171	2,352,321	2,447,813	+228,642

Note: Kentucky's population was estimated at 4,379,730 for 2012. The population 18 years and over was 3,362,380; the population under 18 years was 1,017,350

Data Source: U.S. Census Bureau, Annual Estimates of the Resident Population, 2012

Analysis: Bay Area Council Economic Institute

## Cost

Cost Savings on Preventative Care Visits in Kentucky			
	Year 1	Years 1-10	Year 11+
Additional Visits (000s)	133	1,677	229
Yearly Savings (000s)	\$20,243	\$204,733	\$20,878

Note: Baseline number of preventative care visits includes both adults and children, and are based on 2012 U.S. Census Bureau state population estimates. Estimates for subsequent years do not account for population growth.

Data Source: U.S. Census Bureau

Analysis: Bay Area Council Economic Institute

## Spotlight: Minnesota

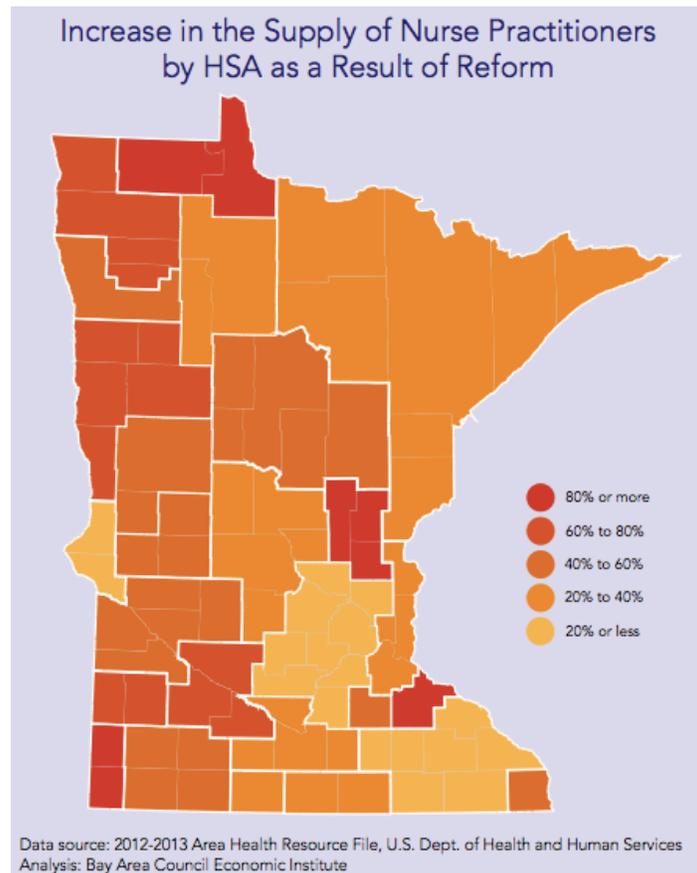
### Access

Clinicians per 100,000 Residents in Minnesota in 2011			
	Primary Care Physicians	Nurse Practitioners	Total
County Average	65	26	91
Urban-County Average	77	35	112
Rural-County Average	62	23	85
HPSA-County Average	23	13	36

Note: Rural and Urban county designations were made using the U.S. Department of Agriculture Rural-Urban Continuum Codes see Resources section for details. Health Professional Shortage Area (HPSA) county designations are made each year by the U.S. Department Health & Human Services.

Data Source: 2012-2013 Area Health Resource File

Analysis: Bay Area Council Economic Institute



Nurse Practitioners per 100,000 Residents by HSA in Minnesota				
HSA	Counties	2011	Post-Reform	Increase
286	Chisago, Dakota, Ramsey, Washington	36	46	31%
289	Carlton, Cook, Itasca, Koochiching, Lake, Pine, St. Louis	52	63	21%
370	Goodhue	11	22	95%
396	Rice	21	31	53%
540	Anoka, Carver, Hennepin, Le Sueur, McLeod, Scott, Sherburne, Sibley, Wright	80	91	14%
547	Becker, Clay, Mahnomen, Norman, Wilkin	17	28	66%
573	Blue Earth, Nicollet, Waseca, Watonwan	39	50	28%
582	Grant, Otter Tail	22	33	49%
584	Polk	22	33	49%
588	Benton, Meeker, Morrison, Stearns, Todd	35	46	31%
590	Big Stone, Traverse	70	81	15%
592	Chippewa, Kandiyohi, Lac qui Parle, Swift, Yellow Medicine	27	38	40%
597	Beltrami, Clearwater	49	60	22%
602	Brown, Redwood, Renville	14	25	79%
603	Isanti, Kanabec, Mille Lacs	12	23	90%
604	Kittson, Marshall, Pennington, Red Lake	16	27	66%
608	Douglas, Pope, Stevens	20	31	54%
609	Lincoln, Lyon	14	25	78%
612	Aitkin, Cass, Crow Wing, Hubbard, Wadena	24	35	45%
619	Cottonwood, Jackson, Murray, Nobles	27	38	40%
631	Lake of the Woods, Roseau	14	24	81%
646	Faribault, Freeborn	46	57	24%
941	Dodge, Fillmore, Mower, Olmsted, Steele, Wabasha, Winona	92	103	12%
958	Martin	43	54	26%
981	Houston	19	30	58%
984	Pipestone, Rock	9	20	118%

Data Source: 2012-2013 Area Health Resource File  
 Analysis: Bay Area Council Economic Institute

## Quality

Yearly Adult Preventative Care Visits in Minnesota in 2012				
	Present	Years 1-2 Following Reform	After Year 10 Following Reform	Increase
Individuals 18 and over:				
Preventative Care Visit in the Past 12 Months	66.0%	70.0%	72.8%	10.3%
Number of Visits Yearly	2,707,974	2,872,094	2,986,977	+279,003

Note: Minnesota's population was estimated at 5,379,139 for 2012. The population 18 years and over was 4,102,991; the population under 18 years was 1,276,148

Data Source: U.S. Census Bureau, Annual Estimates of the Resident Population, 2012

Analysis: Bay Area Council Economic Institute

## Cost

Cost Savings on Preventative Care Visits in Minnesota			
	Year 1	Years 1-10	Year 11+
Additional Visits (000s)	162	2,047	279
Yearly Savings (000s)	\$24,859	\$251,397	\$25,634

Note: Baseline number of preventative care visits includes both adults and children, and are based on 2012 U.S. Census Bureau state population estimates. Estimates for subsequent years do not account for population growth.

Data Source: U.S. Census Bureau

Analysis: Bay Area Council Economic Institute

## Spotlight: New Jersey

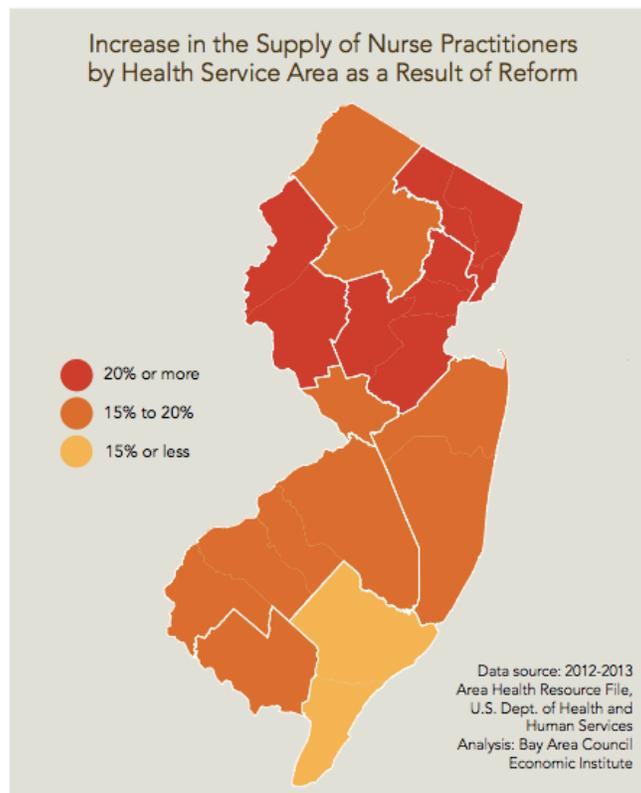
### Access

Clinicians per 100,000 Residents in New Jersey in 2011			
	Primary Care Physicians	Nurse Practitioners	Total
County Average	79	60	139
Urban-County Average	79	60	139
Rural-County Average	N/A	N/A	N/A
HPSA-County Average	N/A	N/A	N/A

Note: Rural and Urban county designations were made using the U.S. Department of Agriculture Rural-Urban Continuum Codes see Resources section for details. Health Professional Shortage Area (HPSA) county designations are made each year by the U.S. Department Health & Human Services.

Data Source: 2012-2013 Area Health Resource File

Analysis: Bay Area Council Economic Institute



Nurse Practitioners per 100,000 Residents by HSA in New Jersey				
HSA	Counties	2011	Post-Reform	Increase
23	Burlington, Camden, Gloucester, Salem	76	88	16%
36	Bergen, Hudson, Passaic	48	60	25%
64	Atlantic, Cape May	99	111	12%
66	Essex, Middlesex, Somerset, Union	59	71	20%
87	Morris, Sussex	71	83	17%
93	Hunterdon, Warren	50	62	24%
108	Monmouth, Ocean	61	73	20%
126	Mercer	73	85	16%
127	Cumberland	64	76	19%

Data Source: 2012-2013 Area Health Resource File  
 Analysis: Bay Area Council Economic Institute

## Quality

Yearly Adult Preventative Care Visits in New Jersey in 2012				
	Present	Years 1-2 Following Reform	After Year 10 Following Reform	Increase
Individuals 18 and over:				
Preventative Care Visit in the Past 12 Months	66.0%	70.0%	72.8%	10.3%
Number of Visits Yearly	4,509,544	4,780,117	4,974,164	+464,620

Note: New Jersey's population was estimated at 8,867,749 for 2012. The population 18 years and over was 6,832,643; the population under 18 years was 2,035,106

Data Source: U.S. Census Bureau, Annual Estimates of the Resident Population, 2012

Analysis: Bay Area Council Economic Institute

## Cost

Cost Savings on Preventative Care Visits in New Jersey			
	Year 1	Years 1-10	Year 11+
Additional Visits (000s)	271	3,408	465
Yearly Savings (000s)	\$40,991	\$414,576	\$42,281

Note: Baseline number of preventative care visits includes both adults and children, and are based on 2012 U.S. Census Bureau state population estimates. Estimates for subsequent years do not account for population growth.

Data Source: U.S. Census Bureau

Analysis: Bay Area Council Economic Institute

## Appendix

### Area Health Resource File

The primary source of data for the analysis was the 2012-2013 Area Health Resource File (AHRF), issued by the Department of Health and Human Services. The AHRF contains county-level data for the entire nation pooled from multiple sources, both public and private. In general, county-level codes and classifications and population characteristics are publicly provided by federal agencies. The majority of clinician counts, expenditure measures and utilization rates are provided by private organizations such as the American Medical Association (AMA) and American Hospital Association (AHA).

Variables used in this analysis:

Variable	Source
State	U.S. Postal Service
County	U.S. Postal Service
FIPS	General Services Administration
Population	U.S. Census Bureau
Rural-Urban Continuum Codes	U.S. Department of Agriculture
Health Provider Shortage Area	U.S. Department of Health and Human Services
Primary Care Physicians	American Medical Association
Nurse Practitioners (w/ NPI)	Centers for Medicare & Medicaid Services
Nurse Practitioners (State Total)	The 2012 Pearson Report, The Kaiser Family Foundation

## Health Service Areas

Health Service Areas (HSAs) were created under the U.S. National Health Planning and Resource Development Act of 1974 and are defined by the National Center for Health Statistics. They are made up of contiguous groups of counties that are used to better understand service areas for hospital-based care, which generally do not fall within an individual county. For this analysis modified HSAs were used as defined by the National Cancer Institute. These HSAs have been modified in such a way so that no HSA crosses state lines.<sup>27</sup>

## Number of Nurse Practitioners by County

Essential to the analysis is the number of nurse practitioners in each county. The AHRF includes a count of nurse practitioners in each county provided by the Centers for Medicare & Medicaid Services, however, this count only includes those with a National Provider Identifier (NPI). The NPI system was developed to simplify administrative and financial transactions under the Health Insurance Portability and Accountability Act (HIPAA). Any nurse practitioner billing Medicare or Medicaid directly – but not necessarily independently – for their services must have a unique NPI. Many nurse practitioners also bill through a physician’s NPI, known as providing care “incident to” the physician’s care, and therefore do not have an NPI.

To estimate the number of nurse practitioners per county it was necessary to use both the number of nurse practitioners per county as provided by the Centers for Medicare & Medicaid Services, and the total number of nurse practitioners as reported by each state’s board of nursing collected by the 2012 Pearson Report. County totals provided by the Centers for Medicare & Medicaid Services were then scaled up so that the total number of nurse practitioners in the state equaled the number provided by each state’s board of nursing. The number of nurse practitioners with an NPI represented 52.6 percent of all nurse practitioners in California; therefore we feel this method is sufficiently robust. However, there is the possibility that the distribution of nurse practitioners throughout the state is affected by selection bias.

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<sup>27</sup> <http://seer.cancer.gov/seerstat/variables/countyattrs/hsa.html>

## Practice Regulations by State in 2008<sup>28</sup>

### No Restrictions:

AZ, ID, IA, ME, MT, NM, OR, RI, UT, WA

### Some Restrictions:

CO, IN, KY, MI, NJ, ND, OK, TN, WV

### Most Restrictions:

AL, CA, CT, FL, GA, IL, KS, LA, MD, MA, MN, MS, MO, NE, NV, NY, NC, OH,  
PA, SD, TX, VA

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<sup>28</sup> *The effects of state-level scope-of-practice regulations on the number and growth of nurse practitioners*, Patricia Reagan and Pamela Salsberry, *Nursing Outlook*, 2013

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## About the Institute

The Bay Area Council Economic Institute is a partnership of business, labor, government, higher education and philanthropy that works to support the economic vitality and competitiveness of the Bay Area and California. The Association of Bay Area Governments is a founder and key institutional partner. The Economic Institute also supports and manages the Bay Area Science and Innovation Consortium (BASIC), a partnership of Northern California's leading scientific research laboratories and thinkers. Through its economic and policy research and its many partnerships, the Economic Institute addresses major issues impacting the competitiveness, economic development and quality of life of the region and the state, including infrastructure, globalization, science and technology, and governance. A public-private Board of Trustees oversees the development of its products and initiatives.



## About the Council

The Bay Area Council is a business-sponsored, public-policy advocacy organization for the nine-county Bay Area. The Council proactively advocated for a strong economy, a vital business environment, and a better quality of life for everyone who lives here. Founded in 1945, as a way for the region's business community and like-minded individuals to concentrate and coordinate their efforts, the Bay Area Council is widely respected by elected officials, policy makers and other civic leaders as the regional choice of business in the Bay Area. Today, more than 275 of the largest employers in the region support the Bay Area Council and offer their CEO or top executive as a member.