Full Practice Authority for Nurse Practitioners Increases Access and Controls Cost

Technical Appendix

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Micah Weinberg, PhD, Senior Fellow at the Bay Area Council Economic Institute, and Patrick Kallerman, Policy Director at Healthy Systems Project, co-authored this report. Joanne Spetz, PhD, Associate Director for Research Strategy at the UCSF Center for the Health Professions served an adviser to the project. Emily Finkle, Policy Manager at the Bay Area Council, also contributed to the project.

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Introduction

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 medical personnel more effectively and efficiently. Fortunately, there is substantial evidence to suggest that this is consistent with comparable if not improved healthcare quality and health outcomes as well as cost savings.

Background

It is estimated that the nation's current supply of primary care providers will need to grow by an additional 2.5 percent in 2014 in order to meet growing demand. While this increase may seem fairly modest, pockets of the nation will see a substantially larger increase in demand. Over 40 million Americans live in areas expected to see an increase in demand greater than 5 percent. Furthermore, there are seven million people living in areas forecasted to see more than a 10 percent increase in demand.[1]

One proposal to address the shortage of primary care physicians is to expand the role of Nurse Practitioners (NPs). Nurse Practitioners came into prominence in the 1960s as a response to a scarcity of physicians. The first NP program was developed at the University of Colorado by Dr. Loretta Ford and Dr. Henry Silver in 1965 and by the 1980s, more than 200 NP programs were offered and over 15,000 NPs were practicing.[2] In 1986, the United States Office of Technology Assessment examined care and practice patterns of NPs 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 both the supply of NPs and allowing them to practice to the full extent of their education.

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[1] *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

[2] American Association of Nurse Practitioners

Nurse Practitioners are required to hold a Registered Nurse (RN) licensure in their state of practice. However, unlike RNs, NPs have advanced beyond the nursing licensure requirements and professional registered nurse preparation. Nurse Practitioners are trained to provide a full range of primary, acute, and specialty healthcare 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 prevention and healthy life choices.

The scope of activities an NP can practice – regulated by the state in which they are licensed – is often widely debated by the medical community, patients, and policymakers. Currently, 17 states and the District of Columbia permit NPs to diagnose, treat and prescribe medications without physician oversight. Eight states allow them to diagnose and treat, but require physician supervision for the prescribing of medications.[3] In early 2014 the Federal Trade Commission recommended states take caution when considering proposals to limit the practice authority of NPs, citing evidence of a reduction in both competition and benefits to consumers that result from such laws.[4] In the state of California, NPs cannot diagnose, treat patients or prescribe medications without a signed collaborative practice agreement and Standardized Procedures (SPs).

[3] *The 2012 Pearson Report and The Kaiser Family Foundation*

[4] *Policy Perspectives: Competition and the Regulation of Advance Practice Nurses*, Federal Trade Commission, March 2014

Methodology

This study seeks to provide a framework to quantify the effects that allowing NPs to practice to the full extent of their education and training would have on the delivery system in California. It is also developed in such a way to allow the analysis to be expanded to other states that have yet to grant NPs full practice authority. The analysis focuses on three metrics where current academic research shows full practice authority is likely to have a significant effect: access, quality, and cost. It is important to note that results and estimations do not account for the expansion of coverage being brought on by the ACA. There are therefore a conservative estimate of the extent to which this policy reform would address and pressing social need and have positive human and economic consequences.

Access

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 23rd in the number of primary care physicians per 100,000 residents.[5] With the state's covered population set to rise substantially, the supply of primary care providers is likely to become strained even further.

The supply of NPs has increased since the profession's inception in the 1960s, and most substantially in the past two decades. There are now 150,000 NPs eligible to practice nationwide, compared to an estimated 260,000 primary care physicians.[6] The number of NPs 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 (RNs) in California. By 2012 their share grew to 5.6 percent.[7] A 2013 report by the Health

[5] Bay Area Council Economic Institute analysis of the Area Health Resource File (AHRF)

[6] *How does provider supply and regulation influence health care markets? Evidence from nurse practitioners and physician assistants*, Kevin Stange, Journal of Health Economics 2013

[7] 2012 Survey of Registered Nurses, California Board of Registered Nursing, Revised October 2013

Resources and Services Administration estimated that the supply of NPs would continue to grow, increasing 30 percent by 2020.

Along with accounting for a rising share of primary care providers, research suggests NPs also serve a diverse and historically underserved population. An analysis by DesRoches et al. of 2008 Medicare administrative data found NPs 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 NPs practiced were more likely to be in either rural or a Health Professional Shortage Areas (HPSA), critical targets for increasing access. [8]

A separate examination provides patient confirmation of DesRoches et al.'s finding. Traczyski and Udalova's analysis of Medical Expenditure Panel Survey (MEPS) data finds that after granting full practice authority for NPs 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 NPs report higher satisfaction with care received when compared to physicians. In the years following scope of practice reform adults report a 13-15 percent increase in visit quality, while children report gains of 17-27 percent.[9]

A comparison of California's NPs 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 NPs practiced at higher rates than physicians. Furthermore, while both NPs and physicians are less concentrated in designated HPSAs, the concentration of NPs per 100,000 residents is just slightly below the county

[8] *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

[9] *Nurse Practitioner Independence, Health Care Utilization, and Health Outcomes* Jeffrey Traczynski and Victoria Udalova, working paper, 2013

average, compared to the concentration of physicians that is much lower than the county average.

Table 1

Providers 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 scope of practice reform in California, we have applied results from an analysis by Patricia Reagan and Pamela Salsberry.[10] Reagan and Salsberry conducted a cross-section analysis of Health Service Areas[11] (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 scope of practice regulations were found to have nearly 11 fewer NPs 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 but unknown extent. The authors give careful consideration to how the price of either type of provider shifts the demand curve for the other. In addition to an unknown substitution effect, occupational restrictions placed on NPs means the market for their services is imperfectly

[10] *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
[11] See Resources section for a description of Health Service Areas

competitive. Assuming that physicians and NPs are substitutes to some extent and taking into consideration the significant restrictions placed on NPs, the authors hypothesized that HSAs in states with restrictive scope of practice regulations would have a reduced number of NPs.

In order to perform a new analysis, that builds on these results this report relies on data on the number of NPs, physicians, and population characteristics for 2001 and 2008 from the AHRF and aggregated into HSAs from individual counties. Scope of practice regulations were collected from the 2008 Pearson Report and categorized based on the methodology of Fairman et al.[12] The resulting sample of HSAs included 90 percent of the U.S. population in 2008. A regression analysis was performed using the change in number of NPs from 2001 to 2008 as the dependent variable, with independent variables for scope of 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 NPs as the dependent variable and using the same independent variables.

The results of Reagan and Salsberry's analysis found that HSAs in states with any form of scope of practice restrictions had fewer NPs per capita than HSAs in states without restrictions. The analysis also showed HSAs in states with scope of practice restrictions to have a 25 percent lower growth rate of NPs 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 NPs and physicians are substitutes in certain environments.

These results can be used to estimate the additional supply of NPs states might have, had scope of practice reform been enacted previously. An analysis of the AHRF for 2011 shows that California HSAs had on average 54 NPs per 100,000 residents. The most recent count of NPs per county and HSA contained within the AHRF is for 2011. Using 2011 gives as up to date an estimate of how NPs 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

[12] *Broadening the scope of nursing practice* Julie Fairman, John Rowe, Susan Hassmiller, Donna Shalala, The New England Journal of Medicine, 2011

states that continue to have restrictive scope of practice regulations fall behind in the number of NPs working in that state. Had California's scope of practice restrictions for NPs been lifted, HSAs in the state would have had an average of 66 NPS per 100,000 residents in 2011, a 22 percent increase on average. Additionally, the growth rate of NPs in the state would also increase by 25 percent, providing much needed relief to the state's healthcare workforce in future years.

Figure 1

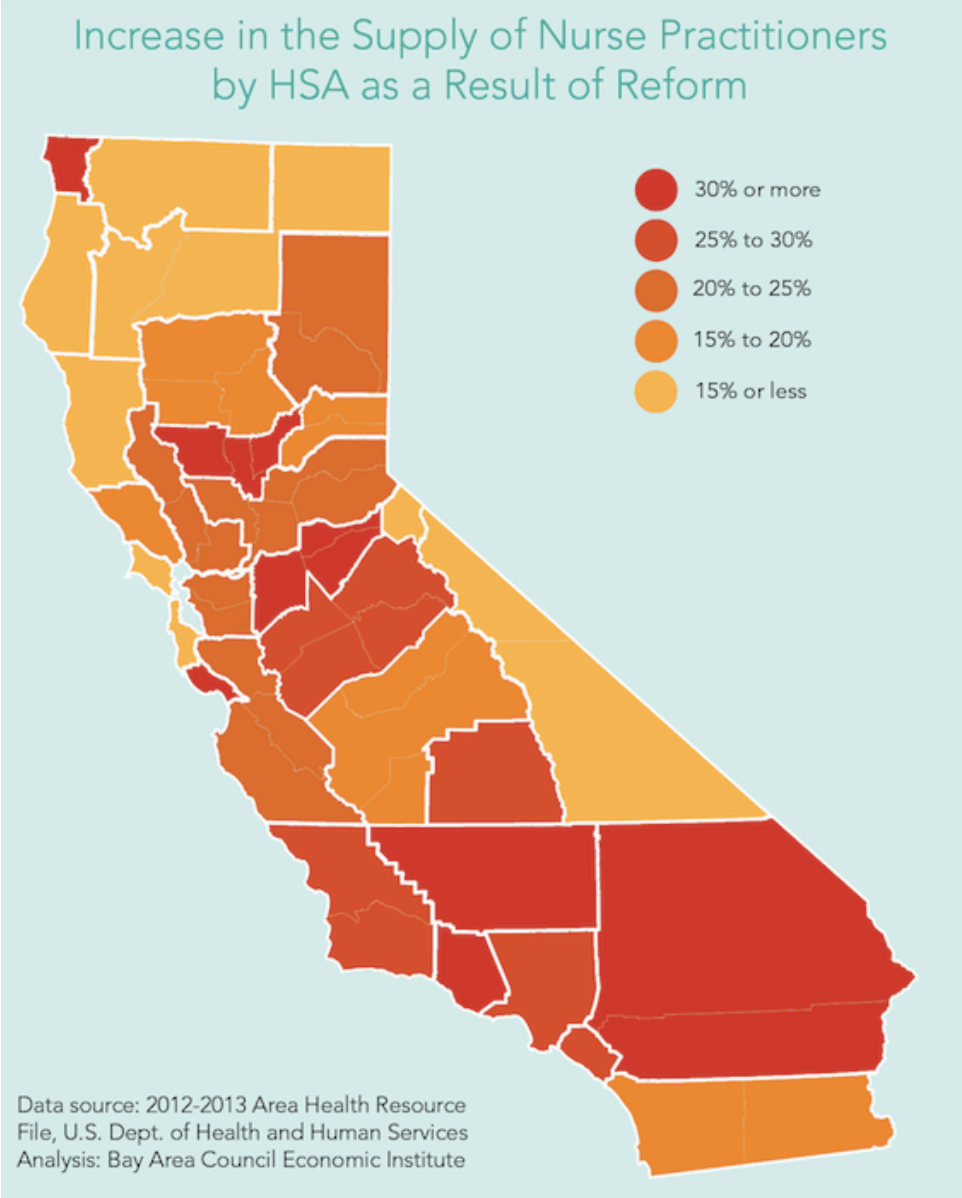

Table 2

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

Demand for healthcare services is likely to outstrip supply in post health reform California. Therefore, an increase in the number of access points of primary care providers would likely address pent-up demand, resulting in increased utilization of healthcare services for both existing covered and newly covered populations. But how will it affect the quality of care delivered? To examine this question this report 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 scope of practice laws in various states, they find an increase in the frequency of routine checkups.

Traczynski and Udalova (2013) first construct a set of data containing scope of practice regulations for NPs 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 scope of practice 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 a 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 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 scope of practice reform.

Table 3 shows what the increase in utilization would like look for California.

Table 3

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

Practice restrictions placed on NPs are likely to increase the price of medical services through artificially limiting supply. Scope of practice reform will enable NPs to operate at their full potential, increasing access and utilization as discussed in previous sections. While this analysis assumes no change in the total number of practicing NPs statewide, it does examine the resulting effects from increased capacity of existing NPs. This increase in supply is likely to have an effect on prices as well as access and utilization.

To examine the effects scope of practice reform will have on prices for a medical service in California, we adapt a methodology developed by Kleiner, et al.[13] 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 NP substitution is considered the norm.

[13] *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

The Fair Health database contained nearly 30 million well child visits from across the nation for 2005 through 2010. The average price paid 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 scope of 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 NPs but allow some prescriptive authority, and over $16 higher in states that require direct supervision and allow no prescriptive authority.

Table 4

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 NPs 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 scope of practice reform.

Table 3 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. **Table 5** illustrates the effect of both the reduction in price of preventative

care visits and the increase in utilization following scope of practice reform. 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 NPs full practice authority nationwide would save $810 million per year in retail clinic settings alone.[14]

Table 5

Cost Savings on Preventative Care Visits in California			
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

[14] *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

Resources

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 provider 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.[15]

Number of Nurse Practitioners by County

Essential to the analysis is the number of NPs in each county. The AHRF includes a count of NPs in each county provided by CMS, 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 NP billing Medicare or Medicaid directly – but not necessarily independently – for their services must have a unique NPI. Many NPs 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 NPs per county it was necessary to use both the number of NPs per county as provided by CMS, and the total number of NPs as reported by each state's board of nursing collected by the 2012 Pearson Report. County totals provided by CMS were then scaled up so that the total number of NPs in the state equaled the number provided by each state's board of nursing. The number of NPs with an NPI represented 52.6 percent of all NPs in California; therefore we feel this method is sufficiently robust. However, there is the possibility that the distribution of NPs throughout the state is affected by selection bias.

[15] http://seer.cancer.gov/seerstat/variables/countyattribs/hsa.html

Scope of Practice Regulations by State in 2008[16]

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

[16] *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.

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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.