



**A NEW VISION FOR CALIFORNIA'S HEALTHCARE SYSTEM:  
Integrated Care with Aligned Financial Incentives**

**Appendix IX. Nurse Practitioners and Physician  
Assistants (Initiative Memorandum)**

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## Appendix IX: Nurse Practitioners and Physician Assistants (Initiative Memorandum)

See “Appendix IV: Introduction to Appendices V-XI” for brief background on this Appendix.

### Executive Summary

Nurse practitioners (NP) and physician assistants (PA) provide many healthcare services, particularly involving primary care. But, the volume of services that they provide relative to primary care physicians varies by state. In 2009, NPs and nurses provided a lower share of office visits to primary care clinicians in California (9.7%), as compared to their share in the rest of the United States (13.9%). In 2009, the PA share in California (2.5%) was similar to the rest of the United States (2.7%).

Increasing the use of NPs and PAs within primary care could reduce California's healthcare expenditures, because their wages are about half of those for primary care physicians. We used data from the Medical Expenditure Panel Survey's Office-Based Medical Provider Visits files and the U.S. Bureau of Labor Statistics to estimate the healthcare expenditure reductions that would result if the shares of office visits to primary care clinicians provided by NPs and PAs were to increase in California.

Under the Current Developments scenario, we assume NP and PA shares of office visits to primary care clinicians increase to 11.8% and 3.2% by 2022, respectively, resulting in a healthcare expenditure decrease of between \$260 million and \$330 million in current-year dollars from 2013-2022, representing 0.006% to 0.008% of projected healthcare expenditures. Under the Forum Vision scenario, we assume NP and PA shares of office visits to primary care clinicians increase to 24.5% and 5.5% by 2022, respectively, which would put California in the 95<sup>th</sup> percentile for each share among the 29 states with credible data to measure the shares. This results in a healthcare expenditure decrease of between \$1.4 billion and \$1.8 billion in current-year dollars from 2013-2022, which represents 0.033% to 0.041% of projected healthcare expenditures. In 2022, the percentage peaks at 0.06% to 0.07%, because NP and PA shares of office visits to primary care clinicians are assumed to reach their highest levels in the 10-year period leading up to 2022.

These expenditure reductions are modest, but they could continue to increase after 2022 if the share of office visits to primary care clinicians provided by NPs and PAs continues to grow. The results are sensitive to the relative productivity of an NP or PA as compared to a primary care physician, which we assumed to be between 80% and 95%. Further research is needed to refine these estimates for particular patient types and different physician/non-physician clinician arrangements, from independent practice to closely integrated teams. One potential barrier to increasing NP and PA shares involves state regulatory requirements pertaining to physician supervision of NPs and PAs, which may indirectly reduce their ability to be reimbursed directly and be empaneled as primary care providers. Under the Forum Vision, which includes a higher adoption of Accountable Care Organizations with global budgets, there will be a greater financial incentive to increase the use of NPs and PAs.



## The Underlying Situation

Nurse practitioners (NP) and physician assistants (PA) provide many healthcare services, particularly in primary care. Increasing the use of NPs and PAs within primary care, particularly for routine and follow-up visits, could reduce California's healthcare expenditures. The wages in California for these occupations are about half of those for primary care physicians, while the Medicare reimbursement for NPs is usually 85% of the physician reimbursement level.<sup>1</sup>

The increased use of NPs and PAs could occur in different models, each with different levels of healthcare integration. On the one hand, NPs and PAs could complement existing primary care physicians and be part of a closely integrated team, such as in a Patient-Centered Medical Home. On the other hand, they could substitute for primary care physicians and practice more independently, something particularly true for NPs in rural areas. Even while practicing independently, NPs could still be virtually integrated and collaborate with a larger team.

The Affordable Care Act is expected to reduce the number of uninsured in California, generating a need to increase the primary care health workforce capacity. In 2014 alone, 1.9 million additional Californians are expected to gain insurance coverage,<sup>2</sup> resulting in an estimated healthcare expenditure increase of 118% for these individuals.<sup>3</sup> This will increase the demand for healthcare workers, particularly in primary care. While there are challenges connected to this development in all parts of the state, rural areas and vulnerable populations are of special concern.

Grumbach et al. used workforce administrative and survey data to estimate the proportion of primary care physicians, NPs, PAs, and other professions that practiced in rural areas, health professional shortage areas, and vulnerable-population areas that were defined by a high concentration of racial minorities and low-income residents.<sup>4</sup> As compared to primary care physicians practicing in these areas, higher shares of both PAs and NPs were practicing (although the result for NPs was not statistically significant at the 0.05 level).<sup>5</sup>

In 2010-2011 in California, there were an estimated 26,230 primary care physicians (family/general practitioners, pediatricians, internists, and gynecologists/obstetricians), as well as 17,032 NPs and 8,170

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<sup>1</sup> Spetz, et al. (2011); U.S. Bureau of Labor Statistics (2011).

<sup>2</sup> Kominski, et al. (2012).

<sup>3</sup> Hadley, et al. (2008).

<sup>4</sup> Grumbach, et al. (2003).

<sup>5</sup> In California, primary care physicians practice in the same rural areas as advanced practice registered nurses (e.g., see National Center for the Analysis of Healthcare Data (2008)). However, Grumbach and colleagues' key results "indicate the proportion of clinicians within each discipline who practice in a rural area and do not indicate the proportion of all clinicians in rural areas who belong to each discipline" (p. 100). Their results did not include whether patients in rural areas, health professional shortage areas, or vulnerable-population areas reported using an NP or PA as their usual source of care. However, a study in Wisconsin found that NPs and PAs serve as primary care providers to underserved patients (Everett, et al. (2009)).



PAs.<sup>6</sup> In the United States, 88% of NPs work in primary care, but only 31% of PAs do so, with much of the remaining working in surgical subspecialties (23%), other specialties (19%), emergency medicine (11%), and internal medicine subspecialties (10%).<sup>7</sup> Table 1 shows the supply and annual wage differences among these workforce professions in and outside of California. California has relatively few NPs and PAs per capita, as compared to the rest of the United States. In 2011, there were 45 and 60 NPs per 100,000 population in California and outside of California, respectively, along with 22 and 28 PAs per 100,000 population, respectively. However, California has more primary care physicians, at 70 per 100,000 population, than the rest of the United States, which has 63 per 100,000 population. In California, the annual wages of NPs and PAs average \$93,000 and \$97,000, respectively, about half that of primary care physicians at \$187,000. PA and primary care physician annual wages in California were similar to those outside of California.

**Table 1: Supply and Annual Salary of Health Workforce Professions in California vs. the Rest of the United States, 2010-2011**

Variable	Nurse Practitioners	Physician Assistants	Primary Care Physicians (1)
Number per 100,000 population			
California	45	22	70
Non-California	60	28	63
California rank (2)	42	35	22
Number of states in sample (3)	51	50	42
Annual Wage (\$2012)			
California	\$92,963	\$96,998	\$187,127
Non-California	N/AV	\$90,650	\$186,716
California rank (2)	N/AV	13	24
Number of states in sample (3)	N/AV	51	41

(1) Primary care physicians include family/general practitioners, pediatricians, internists, and gynecologists/obstetricians. The number of geriatricians by state was not available from the U.S. Bureau of Labor Statistics (2011).

(2) States are ranked in descending order.

(3) Number of states is out of 51, including the 50 states and the District of Columbia.

N/AV: not available

Sources: Nurse practitioner supply in 2011 – Pearson (2012); nurse practitioner wage in 2010 - Spetz et al. (2011); and physician assistant and primary care physician supply and wages in 2011 - U.S. Bureau of Labor Statistics (2011)<sup>8</sup>

<sup>6</sup> U.S. Bureau of Labor Statistics (2011); Pearson L.J. (2012); American Academy of Physician Assistants (2011); American Academy of Nurse Practitioners (2011). Gynecologists/obstetricians are not always counted as primary care physicians, but they are included here because they provide primary care services to women, and some of their services could be performed by an NP or PA.

<sup>7</sup> American Academy of Nurse Practitioners (2011); American Academy of Physician Assistants (2011).

<sup>8</sup> The U.S. Bureau of Labor Statistics' Occupational Employment Statistics Survey Employees includes all part-time and full-time workers who are paid a wage or salary, including paid owners of incorporated firms. The survey does not cover the self-



## Comparing Outcomes of Nurse Practitioners and Physician Assistants with those of Primary Care Physicians

In this section, we briefly review studies that compared NPs to primary care physicians with respect to healthcare quality, patient satisfaction, and health outcomes in primary care settings.<sup>9</sup> In summary, the studies find that NPs produce similar results to those of primary care physicians.

The most recent systematic review of the literature was a 2004 Cochrane Review by Laurant et al., who examined 16 studies from the United Kingdom, United States, and Canada, 13 of which were randomized control trials or had quasi-experimental designs.<sup>10</sup> They found that highly trained nurses, such as NPs, clinical nurse specialists, or advanced practice nurses provided comparable or higher quality care and had comparable patient satisfaction and health outcomes as physicians. Laurant et al. noted caveats to their findings, including concerns about studies having insufficient power and methodological limitations, as well as studies having the patient follow-up period typically being 12 months or less. However, their findings are generally consistent with two previous meta-analyses on doctor-nurse substitution.<sup>11,12</sup> Horrocks and colleagues reviewed 11 randomized controlled trials and 23 observational studies from developed countries, and Brown and Grimes reviewed 38 published and unpublished studies from the United States and Canada.<sup>13</sup>

One study included in the Laurant et al. meta-analysis utilized a randomized control trial to compare NPs with primary care physicians in settings where NPs had the same degree of independence as primary care physicians, including the same authority and responsibilities, and both workforce professions drew from the same patient population.<sup>14</sup> They found that NPs generated comparable results to primary care physicians across measures of satisfaction, self-reported health status, physiologic measures, and utilization. Although the study was rigorous by virtue of including random assignment to the provider type, its external validity may be limited, because the study participants were primarily a safety net population. Further research is needed with independent or small group physician offices with commercially insured patients.<sup>15</sup> Furthermore, preliminary evidence suggests that NPs may use more

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employed, owners and partners in unincorporated firms, household workers, or unpaid family workers; therefore, it undercounts physicians, because some are owners/partners of medical groups (whose total compensation includes profits).

<sup>9</sup> We also discuss comparing physician assistants to primary care physicians, but no systematic review of the literature has been published, so the discussion is briefer.

<sup>10</sup> Laurant, et al. (2004). The study defined patient outcomes as morbidity, mortality, satisfaction, compliance, and patient preferences. It defined primary care physicians as general practitioners, family physicians, pediatricians, general internists and geriatricians.

<sup>11</sup> Horrocks, et al. (2002).

<sup>12</sup> Brown, et al. (1995).

<sup>13</sup> Additional studies are catalogued by the American College of Nurse Practitioners (see American College of Nurse Practitioners (2012).

<sup>14</sup> Mundinger, et al. (2000).

<sup>15</sup> Sox (2000).



resources than primary care physicians in certain situations; however, these studies were not based on randomized controlled trials.<sup>16,17</sup>

After the three meta-analyses, Roblin and colleagues analyzed patient satisfaction survey data from Kaiser Permanente Georgia.<sup>18</sup> Their study is noteworthy for its inclusion of both PAs and NPs, when comparing patient satisfaction with physicians. No significant differences in patient satisfaction were found between NPs and PAs versus physicians. Hooker et al. found similar results with Medicare beneficiaries.<sup>19</sup> However, research in the United Kingdom found a physician is preferred by patients for more serious or difficult conditions, while a nurse is preferred for minor or routine conditions.<sup>20</sup>

## Proposed Initiative

The proposed initiative is to increase the number of office visits to primary care clinicians provided by NPs and PAs. We used the 2002-2009 Medical Expenditure Panel Survey (MEPS) Office-Based Medical Provider Visits files to estimate NPs' and PAs' current shares of office visits in California and other states. These files are based on the information collected in the MEPS Household and Medical Provider Components.<sup>21</sup> While its sampling method is designed to produce a nationally representative sample of office visits by the civilian non-institutionalized population of the United States, it is also possible to produce state-level estimates in the 29 most populous states, which includes California.<sup>22</sup>

To isolate the sample to mostly include primary care visits, we examined only visits provided by NPs and nurses<sup>23</sup> and PAs, as well as the following types of physicians: general practitioners, family practitioners, pediatricians, internists, gynecologist/obstetricians, or geriatricians.<sup>24</sup> In 2009, there were 64 million visits to these clinicians in California. Figure 1 shows the share of these visits provided by NPs and nurses as well as PAs in California versus the rest of the United States, from 2002 to 2009. For most years, NPs

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<sup>16</sup> Hooker, et al. (2001).

<sup>17</sup> Hemani, et al. (1999).

<sup>18</sup> Roblin, et al. (2004).

<sup>19</sup> Hooker, et al. (2005).

<sup>20</sup> Drury, et al. (1988).

<sup>21</sup> The research using the MEPS was conducted while co-author (Fulton) was a Special Sworn Status researcher of the U.S. Census Bureau at the Center for Economic Studies. Research results and conclusions expressed are those of the co-author and do not necessarily reflect the views of the Census Bureau. The results have been screened to insure that no confidential data are revealed.

<sup>22</sup> Sommers (2005).

<sup>23</sup> The MEPS Office-Based Medical Provider Visits questionnaire asks if the patient saw a physician. For patients who did not see a physician, the questionnaire asks the type of provider the patient saw. It lists several choices, including nurse/nurse practitioner and physician assistant. The choice of nurse and nurse practitioner is combined, so it encompasses all nurses as well as other advanced practice registered nurses, including clinical nurse specialists and nurse anesthetists. Because a physician was not seen during the visit, we assume most of the visits indicated by nurse/nurse practitioner were provided by nurse practitioners. If not, we assume the nurse practitioner share of these visits was similar across states.

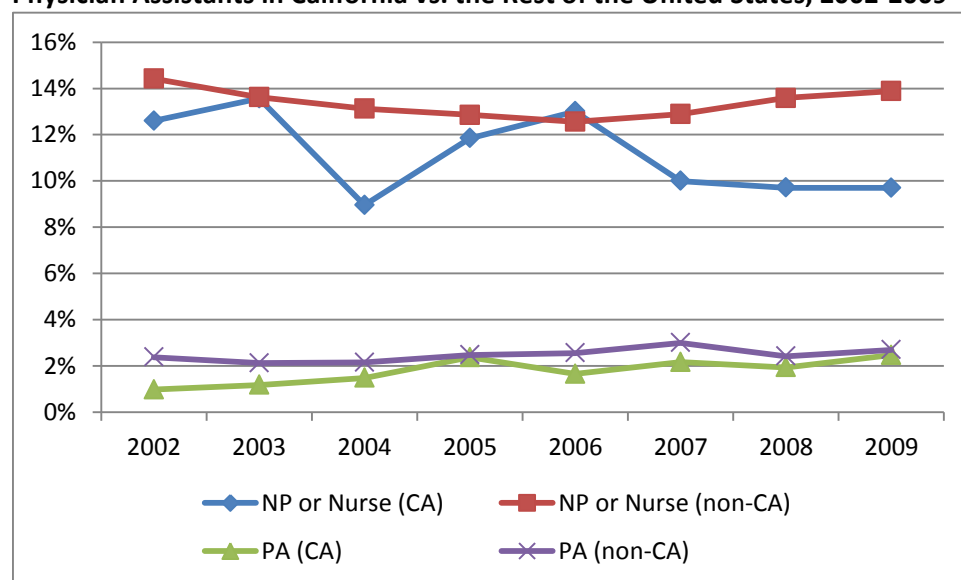
<sup>24</sup> NPs and PAs, PAs in particular, work outside of primary care, so we are overstating the number of primary care visits provided by these clinicians. However, the number will be overstated in every state, and our principal purpose was to compare the share of visits to primary care clinicians provided by NPs and PAs in California with the share provided in the rest of the United States. This value of this comparison would be reduced if the share of NPs and PAs working outside of primary care significantly varies between California and the rest of the United States.



and nurses provided a higher share of these visits outside of California as compared to their share in California, particularly during the past three years when the difference was statistically significant at the 0.05 level. From 2007-2009, the mean share of office visits provided by NPs and nurses ranged from a low of 5.1% in New Jersey to a high of 29.8% in Missouri. The share in California was 9.8%.

PAs provided a higher share of these visits from 2002-2004 outside of California, but the differences in the latter years diminished and were not statistically significant at the 0.05 level. From 2007-2009, the mean share of office visits provided by PAs ranged from a low of 0.1% in Alabama to a high of 6.6% in Arizona. The share in California was 2.2%.

**Figure 1: Shares of Office Visits to Primary Care Clinicians Provided by Nurse Practitioners/Nurses and Physician Assistants in California vs. the Rest of the United States, 2002-2009**



Source: Medical Expenditure Panel Survey Office-Based Medical Provider Visit Files. Shares are based on total number of office visits provided by nurse practitioners and nurses, physician assistants, as well as the following types of physicians: general practitioners, family practitioners, pediatricians, internists, gynecologist/obstetricians, or geriatricians.<sup>25</sup>

Abbreviations: NP: nurse practitioner, PA: physician assistant, CA: California, non-CA: United States (excluding California)

## Modeling Approach & Assumptions

In this section, we discuss our approach and the assumptions used to estimate the healthcare expenditure reductions that would result from increasing the use of NPs and PAs. The section discusses

<sup>25</sup> These estimates are based on MEPS national-level sampling weights, because state-level sampling weights were not available for the 21 least-populous states or the District of Columbia, and because our principal purpose was to compare California with the rest of the country. When state-based weights were used for California, the shares of office visits to primary care clinicians provided by NPs and PAs in California averaged only 0.40 and 0.04 percentage points higher, respectively, over the eight-year period, than when national-level sampling weights were used.





the shares of office visits to primary care clinicians provided by NPs and PAs under the Current Developments and Forum Vision scenarios as well as the wage and productivity differences between NPs and PAs versus primary care physicians.

### **Initiative Penetration Rates: Share of Office Visits to Primary Care Clinicians Provided by Nurse Practitioners and Physician Assistants**

In California from 2007-2009, there was an average of 61 million, or 1.7 per capita, office visits to primary care clinicians. We assumed the number of visits per capita would remain constant from 2013-2022. We also assumed that in the Berkeley Forum's status quo 2013-2022 healthcare expenditure projections, the NP share of the 2007-2009 visits (9.8%) and the PA share of the 2007-2009 visits (2.2%) would remain constant.

### **Current Developments Scenario: Nurse Practitioner and Physician Assistant Shares of Office Visits to Primary Care Clinicians**

As shown in Figure 1, the share of office visits to primary care clinicians provided by NPs and nurses decreased in California during 2002-2009, approximately 0.4 percentage points per year.<sup>26</sup> However, during the last three years of the period, 2007-2009, the shares were fairly stable at 10.0%, 9.7%, and 9.7%, respectively. The demand for primary care will significantly increase in 2014, when an estimated 1.9 million Californians gain health insurance because of the Affordable Care Act. This increase in demand, coupled with the formation of accountable care organizations, may result in the increased use of NPs. Based on a 2010 survey of NPs in California, approximately one-quarter of them were not working as NPs, and some could presumably help fill the additional demand.<sup>27</sup> Therefore, under the Current Developments scenario, we assume the share of these visits provided by NPs will increase at a constant rate from 9.8% in 2012, which is the 2007-2009 average share, to 11.8% by 2022, a two percentage point increase.

As shown in Figure 1, the share of office visits to primary care clinicians provided by PAs increased in California during 2002-2009 by approximately 0.2 percentage points per year.<sup>28</sup> As stated above, the demand for primary care will significantly increase in 2014. Therefore, under the Current Developments Scenario, we assume the share of these visits provided by PAs will increase at a constant rate from 2.2% in 2012, which is the 2007-2009 average share, to 3.2% by 2022, a one percentage point increase.

### **Forum Vision Scenario: Nurse Practitioner and Physician Assistant Shares of Office Visits to Primary Care Clinicians**

The MEPS is able to produce state-level estimates for the 29 most populous states, which includes California. Under the Forum Vision scenario, like the Current Developments scenario, we assume the NP and PA shares of office visits to primary care clinicians start at 9.8% and 2.2%, respectively, in 2012.

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<sup>26</sup> This estimate is based on the slope of the NP and nurse line for California in Figure 1, using an ordinary least squares regression model.

<sup>27</sup> Spetz, et al. (2011).

<sup>28</sup> This estimate is based on the slope of the PA line for California in Figure 1, using an ordinary least squares regression model.





Next, we assume the shares increase at a constant rate so that by 2022, the shares reach the 95<sup>th</sup> percentile of 29 states during 2007-2009, or 24.5% for NPs and 5.5% for PAs. These shares are still much lower than the highest states. During 2007-2009, the mean share of these visits provided by NPs was 29.8% in Arizona, and 6.6% for PAs in Oklahoma.

### Wage and Productivity Differences

The reduction in healthcare expenditures per visit is based on the difference between the weighted mean annual wage of primary care physicians and the mean annual wage of NPs or PAs (see Table 1),<sup>29</sup> adjusted for their relative productivities, which are affected primarily by the additional education and training that physicians receive. A number of studies have examined the relative productivity of NPs and PAs as compared to primary care physicians.<sup>30</sup> For example, a study found that all three provider types saw the same number of patients per hour.<sup>31</sup> Another study of PAs found they saw 86% as many patients per week as the supervising physician.<sup>32</sup> Furthermore, studies have provided preliminary evidence suggesting higher resource utilization among NPs as compared to physicians.<sup>33,34</sup> Therefore, we assumed NPs and PAs were 80% as productive as primary care physicians for our low expenditure reduction estimate, and were 95% as productive for our high expenditure reduction estimate. We assumed a primary care physician provides an average of 3,626 office visits per year, based on data from the 2009 National Ambulatory Medical Care Survey.<sup>35</sup>

### Estimated Impact

Table 2 shows healthcare expenditure reduction estimates under the Current Developments scenario. They range from \$3 million to \$4 million in 2013, and then increase to between \$55 million and \$70 million by 2022.<sup>36</sup> During 2013-2022, the expenditure reduction estimates range from \$260 million to \$330 million, representing 0.006%-0.008% of projected healthcare expenditures.

<sup>29</sup> The wages in Table 1 are stated in 2012 dollars (as of May 2012). From 2013-2022, we converted wages to current-year dollars by using forecasts of the All Items Consumer Price Index for All Urban Consumers (CPI-U) for the U.S. City Average from the Puget Sound Economic Forecaster, prepared by Conway Pedersen Economics, Inc. The forecasted compounded average annual increase between 2012 and 2022 was 2.4% (Puget Sound Economic Forecaster (2012)).

<sup>30</sup> Hooker (2006); Scheffler (2008).

<sup>31</sup> Hooker (1993).

<sup>32</sup> Gryzbicki, et al. (2002).

<sup>33</sup> Hemani, et al. (1999).

<sup>34</sup> Hooker, et al. (2001).

<sup>35</sup> The number of visits by a primary care physicians is based on the total number of visits provided by general and family practitioners, internists, pediatricians, and obstetricians/gynecologists divided by the number of these physicians, assuming 70% full-time employment (Centers for Disease Control and Prevention (2009a & 2009b). Based on a 46-week year, this results in 79 visits per week, consistent with the volume in Eibner, et al. (2009).

<sup>36</sup> All healthcare expenditure reduction estimates are reported in current-year dollars.



**Table 2: Healthcare Expenditure Reduction Estimates Under the Current Developments Scenario, 2013-2022**

	2013		2022		2013 - 2022		
	Lower	Upper	Lower	Upper	Lower	Mid	Upper
Status Quo Expenditures (billions)	\$327.6		\$572.2		\$4,387.1		
Expenditure Reduction (billions)	\$0.003	\$0.004	\$0.055	\$0.070	\$0.260	\$0.295	\$0.330
Expenditure Reduction (%)	0.001%	0.001%	0.010%	0.012%	0.006%	0.007%	0.008%

Table 3 shows healthcare expenditure reduction estimates under the Forum Vision scenario. They range from \$15 million to \$19 million in 2013, and then increase to between \$334 million and \$423 million by 2022. During 2013-2022, the expenditure reduction estimates range from \$1.426 billion to \$1.802 billion, representing 0.033%-0.041% of projected healthcare expenditures.

**Table 3: Healthcare Expenditure Reduction Estimates Under the Forum Vision Scenario, 2013-2022**

	2013		2022		2013 - 2022		
	Lower	Upper	Lower	Upper	Lower	Mid	Upper
Status Quo Expenditures (billions)	\$327.6		\$572.2		\$4,387.1		
Expenditure Reduction (billions)	\$0.015	\$0.019	\$0.334	\$0.423	\$1.426	\$1.614	\$1.802
Expenditure Reduction (%)	0.004%	0.006%	0.058%	0.074%	0.033%	0.037%	0.041%

## Discussion

Under the Current Developments scenario, we assume California nurse practitioners will increase their share of office visits to primary care clinicians from 9.8% in 2012 to 11.8% by 2022, and physician assistants will increase their share from 2.2% in 2012 to 3.2% by 2022. During 2013-2022, healthcare expenditures are estimated to decrease between \$260 million and \$330 million, representing 0.006%-0.008% of projected healthcare expenditures. In 2022, the percent reduction is 0.010%-0.012%. Under the Forum Vision scenario, we assume California NPs will increase their share of office visits to primary care clinicians from 9.8% in 2012 to 24.5% by 2022, and PAs will increase their share from 2.2% in 2012 to 5.5% by 2022. The higher shares represent the 95<sup>th</sup> percentile share among 29 states with credible data. During 2013-2022, healthcare expenditures are estimated to decrease between \$1.4 billion and \$1.8 billion, representing 0.033%-0.041% of projected healthcare expenditures. In 2022, the percent reduction is estimated to be 0.06%-0.07%. These expenditure reductions are modest, but they could increase beyond 2022 if the share of office visits to primary care clinicians provided by NPs and PAs continues to increase.

Our estimated expenditure reduction is significantly less than Eibner et al. found in Massachusetts when they simulated the increased use of NPs and PAs in that state.<sup>37</sup> They estimated that Massachusetts could decrease its healthcare expenditures from 0.63%-1.25% from 2010-2020. There are two major reasons why their estimate was higher. First, their per-visit expenditure difference between physicians

<sup>37</sup> Eibner, et al. (2009).



versus NPs and PAs was \$77, while ours was lower, ranging from \$18 to \$25 (all figures reported in 2012 dollars). This is because our difference included only the wage differential between primary care physicians versus NPs and PAs, while their difference was based on the actual reimbursement difference. We did not use actual reimbursement differences, because we were primarily interested in estimating expenditure reductions that would likely occur in the long run through lower cost workforce professions.<sup>38</sup> Because of Massachusetts' record of high healthcare expenditure increases, Eibner et al. increased the \$77 difference at 5.72% per year over their 11-year forecast period. We increased annual wages of each provider based on CPI-U forecasts, which averaged 2.4% per year. In addition, a small portion of the difference is attributed to our assumption that NPs and PAs were moderately less productive than physicians. Second, Eibner et al.'s model included all office visits, while our model only included office visits provided by primary care physicians, NPs or PAs.

### **Barriers to Increasing the Use of Nurse Practitioners and Physician Assistants**

The barriers to increasing NP and PA shares of office visits to primary care clinicians include state regulatory requirements, such as physician supervision of these workforce professions, which may indirectly reduce their ability to be reimbursed directly and be empaneled as primary care providers. We do not find evidence of supply constraints. Under the Forum Vision scenario, which includes a higher adoption of Accountable Care Organizations with a global budget, there will be a greater financial incentive to increase the use of NPs and PAs.

### **Supervision Requirements**

In the United States, NPs can practice in three different roles depending on the state: independently without physician involvement (18 states and the District of Columbia); with written documentation of physician involvement to prescribe, but physician involvement is not required to diagnose and treat patients (eight states); and with written documentation of physician involvement to prescribe as well as to diagnose and treat patients (24 states).<sup>39</sup> California is in the third category, and a physician can supervise up to four NPs who prescribe medications.<sup>40</sup>

A PA's practice is either determined by the state or is delegated to the supervising physician. Five key affected practice areas include the following: prescription authority, scope of practice, adaptable supervision, chart co-signature, and ratio of PAs to supervising physician.<sup>41</sup> California delegates three of these practice decisions to the supervising physician, but it mandates chart co-signatures and limits physician supervision to a maximum of four PAs.<sup>42</sup> It is not clear whether these requirements decrease the use of PAs in California. In 2007, Assembly Bill 3 "California Physician Team Practice Improvement

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<sup>38</sup> In Medicare, NPs and PAs can bill under the physician's billing number at 100% of the physician's rate, if the service is incidental to the physician's service and they are under the physician's supervision (Rickard (2009)). Therefore, there would be no expenditure difference, even with the lower cost of providing these services by NPs and PAs.

<sup>39</sup> Pearson L.J. (2012). Of the 24 states that require physician involvement to prescribe or to diagnose and treat patients, written documentation of the relationship is not required to diagnose and treat patients in four of the states.

<sup>40</sup> Christian, et al. (2008).

<sup>41</sup> American Academy of Physician Assistants (2012).

<sup>42</sup> Nineteen states do not mandate chart co-signatures, and nine states do not mandate a maximum ratio restriction.



Act” relaxed some state mandates, increasing from two to four the number of PAs a physician could supervise and allowing PAs to issue drug orders for Schedule II to Schedule V controlled substances. But the law also stipulated that PAs could make these prescriptions only if protocols were established by the supervising physician, and only if the PA completed certain educational requirements.

### **Reimbursement and Empanelment**

NP and PA reimbursement levels and policies by private and public payers vary across states.<sup>43</sup> In some states, private commercial payers are required to reimburse NPs and PAs at the physician rate and/or require the reimbursement be paid directly to the NP or PA. California does not have either of these requirements, which may potentially contribute to the state’s relatively low use of NPs and PAs. Medicare generally reimburses NPs and PAs at 85% of a physician’s rate, if they bill under their own Medicare number. If the treatment is incidental to that provided by a physician, they can bill at 100% of the physician’s rate if they are under the physician’s supervision. Medi-Cal reimburses at 100% of a physician’s rate, but the reimbursement can only be made to the employing physician, organized outpatient clinic, or hospital outpatient department.<sup>44</sup>

Although reimbursement levels and policies are important, reimbursements depend on a strong demand for NPs and PAs, which is affected by empanelment policies of managed care organizations (MCO). In 2005, 2007, 2009 and 2011, the National Nursing Centers Consortium conducted a telephone survey asking the 10 largest MCOs offering health maintenance organization products in each state if they credentialed NPs as primary care providers.<sup>45</sup> Between 2007 and 2011, the share of MCOs outside of California that credentialed NPs increased from 53% to 75%; however, the share in California was lower and has been flat at about 40%.<sup>46</sup> The demand for NPs could be increased if more managed care organizations for commercially insured patients empaneled NPs, because more patients would have the opportunity to select them, and indeed might do so if their resulting cost sharing payments were lower.<sup>47</sup> The demand for PAs could be increased if managed care organizations for commercially insured patients empaneled PAs directly, or else allowed primary care physicians to increase their patient panel size if they were being supported by PAs. Medi-Cal allows NPs and PAs to be empaneled to provide primary care services, but their panel is restricted to 1,000 patients versus 2,000 for physicians.<sup>48</sup>

### **Potential Supply Barriers**

Overall, there seems to be a sufficient supply of NPs and PAs in California to increase their shares of office visits to primary care clinicians. Based on California having approximately 15,000 NPs and 2,500 PAs working in primary care, these workers could provide approximately 51 million to 60 million visits

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<sup>43</sup> Chapman, et al. (2010).

<sup>44</sup> California Department of Health Care Services (2010).

<sup>45</sup> Hansen-Turton, et al. (2008).

<sup>46</sup> National Nursing Centers Consortium (2012).

<sup>47</sup> In California, Medi-Cal allows nurse practitioners to be empaneled in their managed care contracts.

<sup>48</sup> Medi-Cal Managed Care Division (2011).



per year, far more than the 23 million visits under the Forum Vision scenario in 2022.<sup>49</sup> Moreover, as of 2010, approximately one quarter of licensed NPs were not working as an advanced practice registered nurse (e.g., as an NP).<sup>50</sup> If some of these licensed NPs became employed as NPs, more patients could be provided services by them. However, an increase in demand for NPs would be needed to induce them back into the role of NP. In the United States as a whole, the number of NPs who self-identify their positions as NPs is projected to increase by 130% between 2008 and 2025, from 86,000 to 198,000.<sup>51</sup> If California increased its demand for NPs, some NPs in other states might migrate into California. This projection may be high if the American Association of Colleges of Nursing's recommendation that the APRN education level be increased from a master's to a doctorate degree by 2015 is adopted.<sup>52</sup>

In the United States, the number of clinically active PAs is expected to increase by 72% between 2010 and 2025, from 74,500 to 128,000.<sup>53</sup> If California increased its demand for PAs, some PAs in other states might migrate into California. The California Academy of Physician Assistants notes the state-generated supply of PAs in California is limited by the number of clinical training sites. The number of sites could be increased if Song-Brown training funds were made available to community clinics to train primary healthcare teams.<sup>54</sup>

### Limitations

The assumptions used to estimate expenditures reductions from increasing the use of NPs and PAs have six limitations that should be noted. First, estimates are based on the annual wage difference between those workforce professions and primary care physicians. In the long run, the wage difference reflects supply-side factors, principally the longer education and post-education training required for physicians. If wage costs are reduced, it does not mean reimbursement rates would necessarily decrease by the same proportion, particularly in the short run. However, in the long run, when a medical group negotiates reimbursement levels with private payers, it might be willing to accept a lower reimbursement if more NPs and PAs were being used, particularly if its competition was doing the same thing. With respect to Medicare Part B, physician reimbursement rate increases are supposed to be aligned with increases in the U.S. gross domestic product, as also known as the Medicare Sustainable Growth Rate (SGR). However, during most of the past decade, the U.S. Congress has over-ridden the proposed rate cuts necessary for SGR. If medical groups increased the use of NPs and PAs, then Part B rates might have to increase less, better enabling the program to meet the SGR.

Second, because NPs and PAs can provide services at a lower cost, if that reduction is passed onto patients, there will likely be an increased demand for services. Depending on the elasticity of demand,

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<sup>49</sup> The 51 million to 60 million figure is based on 15,000 NPs and 2,500 PAs providing 80%-95% of 3,626 visits per year, the average for primary care physicians. For more information, see Wage and Productivity Differences section.

<sup>50</sup> Spetz, et al. (2011).

<sup>51</sup> Auerbach (2012).

<sup>52</sup> Bellini, et al. (2012).

<sup>53</sup> Hooker, et al. (2011). This forecast is for all PAs, not just PAs projected to practice in primary care.

<sup>54</sup> Anderson (2013).



this could result in increased healthcare expenditures. However, this effect will be minimal for insured patients with low cost sharing.

Third, the estimates assume that an increasing number of patients are willing to have NPs and PAs provide their primary care services in California. This may indeed be the case, as NPs and PAs are already providing these visits in other states at the proposed shares. However, patient preferences likely differ around the country. Notwithstanding, reference pricing and value-based insurance designs could provide a financial incentive for patients to have NPs and PAs provide more of their primary care services.

Fourth, if NPs and PAs provide a higher share of office visits to primary care clinicians, it is important that they see patients with conditions that do not require a primary care physician. In a team-based practice that includes physicians as well as NPs and PAs, the NPs and PAs could focus on seeing established patients and consulting with a physician on complex cases. The decision criteria for how patients would be divided between physicians versus NPs or PAs in a team practice could be determined by that team, based on its particular relationships and experiences. Retail clinics cater to patients with routine conditions, so increasing the number of retail clinics may increase the number of primary care visits provided by NPs and PAs. However, it is important that these clinics do not lead to uncoordinated care, although that can be avoided with certain medical group-retail clinic models.<sup>55</sup>

Fifth, by assuming NPs and PAs provide 80-95% of the number of visits that a physician would provide in a given amount of time, our healthcare reduction estimates accounted for the possibility that NPs and PAs may not be as productive as physicians,<sup>56</sup> or may use more resources.<sup>57,58</sup> The 80%-95% factor could be further refined for specific healthcare settings with different physician/non-physician clinician team arrangements.

Sixth, we estimated healthcare expenditure reductions for the increased use of NPs and PAs only in primary care. These reductions could be greater if the analysis was expanded to include specialty care, particularly for PAs. The estimate could be even further expanded to include other less-expensive health workforce professions, such as optometrists, pharmacists, nurse anesthetists and midwives, marriage and family therapists, physical therapists, and paramedics.<sup>59</sup>

## Conclusion

Increasing the use of nurse practitioners and physician assistants within primary care could reduce California's healthcare expenditures; however, the reduction would be modest during 2013-2022. If

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<sup>55</sup> Pollack, et al. (2010).

<sup>56</sup> Gryzbicki, et al. (2002).

<sup>57</sup> Hemani, et al. (1999).

<sup>58</sup> Hooker, et al. (2001).

<sup>59</sup> Dower, et al. (2007).



their shares of visits to primary care clinicians continued to increase beyond 2022, the potential for additional healthcare expenditure reductions would increase.

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