



California Health Care Foundation



## California Physician Supply and Distribution: Headed for a Drought?

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## Authors

Janet M. Coffman, MPP, PhD  
Margaret Fix, MPH  
Healthforce Center and Philip R. Lee  
Institute for Health Policy Studies  
University of California, San Francisco

Michelle Ko, MD, PhD  
Department of Public Health Sciences  
University of California, Davis

## About the Foundation

The California Health Care Foundation is dedicated to advancing meaningful, measurable improvements in the way the health care delivery system provides care to the people of California, particularly those with low incomes and those whose needs are not well served by the status quo. We work to ensure that people have access to the care they need, when they need it, at a price they can afford.

CHCF informs policymakers and industry leaders, invests in ideas and innovations, and connects with changemakers to create a more responsive, patient-centered health care system.

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## Summary

This report describes the number of licensed physicians in California in 2015, including their practice activities, demographic characteristics, and geographic distribution. Data were derived from the Medical Board of California's mandatory survey for relicensure and a voluntary supplemental survey conducted in 2015. Where data from 2013 were available, changes from 2013 to 2015 were included.

## Key Findings

**Less than half of the 139,000 medical doctors licensed by the state of California (61,196) could be identified as active patient care physicians (physicians who provided 20 or more hours per week of patient care in California).** Some physicians with California licenses did not practice in California. Others did not renew their licenses within the two-year period required under California law. Some were completing residency or fellowship training.

**The total supply of active patient care physicians declined slightly between 2013 and 2015.** This trend appears to be driven by the aging of the physician workforce. Older physicians reported spending fewer hours per week on patient care, and were the most likely to report providing no patient care at all. The percentage of active patient care physicians over age 60 declined by eight percentage points between 2013 and 2015, while the percentage of active patient care physicians in other age groups remained stable.

**Female and male physicians engaged in patient care at similar rates.** A slightly higher percentage of females reported spending at least 20 hours per week on patient care (81% of females versus 78% of males).

**Latinos and African Americans were substantially underrepresented in the physician workforce.** Five percent of active patient care physicians reported Latino ethnicity, versus 38% for the general population. Three percent of physicians were African American, versus 6% of the general population.

**Thirty-two percent of California's active patient care physicians were primary care physicians (defined as family physicians, general internists, general pediatricians, and general practitioners).**

**The distribution of both primary and specialty care physicians was uneven in the state.** Ratios of active patient care physicians per 100,000 people in the Inland Empire and San Joaquin Valley regions were approximately half that of the Greater Bay Area for both primary care and specialty care physicians.

**The distribution of physicians across types of practice varied by physician age and specialty.** Over 40% of physicians age 60 or older were in solo practice, whereas 79% of those under 40 years old reported that they practiced in Kaiser Permanente or in another group practice. Psychiatrists were more likely to be in solo practice or to work in a community health center or public clinic than physicians in other specialties.

**Physicians were more likely to accept patients with any type of health insurance than uninsured patients, but were less likely to accept Medi-Cal than other forms of health insurance.** In 2015, 62% of primary care physicians and 64% of specialists had any Medi-Cal patients. Fifty percent of primary care physicians and 57% of specialists had any uninsured patients.

## Recommendations

To address the challenges in California physician supply and distribution identified in this study, the authors offer the following recommendations:

- ▶ Increase funding to expand undergraduate medical education, particularly in underserved areas.
- ▶ Increase funding to expand graduate medical education, particularly in specialties with projected shortages.
- ▶ Provide financial incentives for both primary care and specialty physicians to practice in underserved areas.
- ▶ Support opportunities for international medical graduates to practice in underserved areas of the state.
- ▶ Increase investments in programs that address the diversity of the physician workforce.
- ▶ Invest in technologies, such as telehealth and electronic consultation and referral, that can maximize scarce physician resources, especially for rural areas.
- ▶ Provide training, support, and incentives for team-based care.



## Introduction

Major demographic trends are driving an increasing demand for health care in California. The state's total population is projected to increase by 6.4 million people between 2015 and 2035, and the population age 65 or older is projected to increase by 4.9 million.<sup>1</sup> With an aging population, patient health needs will likely increase in complexity and severity. To anticipate the state's ability to respond to these demographic trends, California policymakers need to understand the current supply of active physicians, the number providing patient care, and how they are distributed across the state.

This report provides detail on the total number of active licensed physicians (MDs) in California, across its regions and 58 counties. It also describes the number of hours licensed physicians spend on patient care and other activities. Findings regarding the specialty, age, gender, and racial and ethnic distribution of active patient care physicians and their practice settings are presented. When applicable, findings from 2013 are compared to findings from 2015.

## Methodology

The study methodology is discussed briefly here. For a more detailed description of methods, refer to [Appendix A](#).

Most of the data presented in this report are from the Medical Board of California's mandatory survey, which contains information on physician demographics, specialty, board certification, location, and practice activities, including time spent on patient care. The survey is administered to physicians who are renewing licenses in the state (required every two years). Responses from MDs who renewed their licenses between August 1, 2013, and July 31, 2015 were analyzed.

Information on practice settings was derived from a voluntary supplemental survey administered to a sample of physicians whose licenses were due for renewal from June through December 2015.

Analyses were limited to physicians with active licenses who were located in the state (as determined by zip code) and were no longer in training. To broadly compare primary care versus specialty care physician supply, physicians in the following specialties were categorized as primary care physicians: family medicine (including general practice), general pediatrics, and general internal medicine (including geriatric medicine). The remainder were classified as specialty care physicians.

## Findings

### Physician Supply and Activities

According to the Medical Board of California's records, approximately 139,000 physicians had an active license in California in 2015 (Table 1). However, fewer than half of all MDs licensed by the state of California (61,196) could be identified as active patient care physicians (physicians who provided 20 or more hours per week of patient care in California). The differences were due to several factors. More than 25,000 physicians with California licenses did not practice in the state. Some physicians did not renew their licenses within the two-year period required under California law, while others were completing residency or fellowship training.

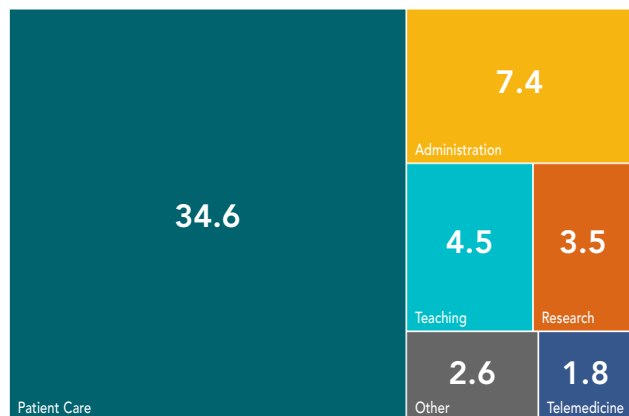
**Table 1. Active Licensed Physicians, 2015**

	NUMBER OF MDs
<b>Active California license</b>	<b>139,222</b>
California zip code	113,034
Two-year cohort	93,023
Not in training	87,111
Survey response	81,003
Answered patient care question	77,847
Any patient care: 1+ hours per week	71,348
Patient care: 20+ hours per week	61,196
Identified specialty and/or board certification	60,231

Source: Analysis of Medical Board of California data by the Philip R. Lee Institute for Health Policy Studies, University of California, San Francisco.

**Patient care.** Of 81,003 non-trainee physicians with practice locations in California who completed the survey, the average number of hours spent per week on patient care was 34.6 (Figure 1). Primary care and specialty care physicians provided similar percentages of patient care at 20+ hours per week, but the percentage of specialists that reported spending 40+ hours per week on patient care was somewhat higher (Figure 2).

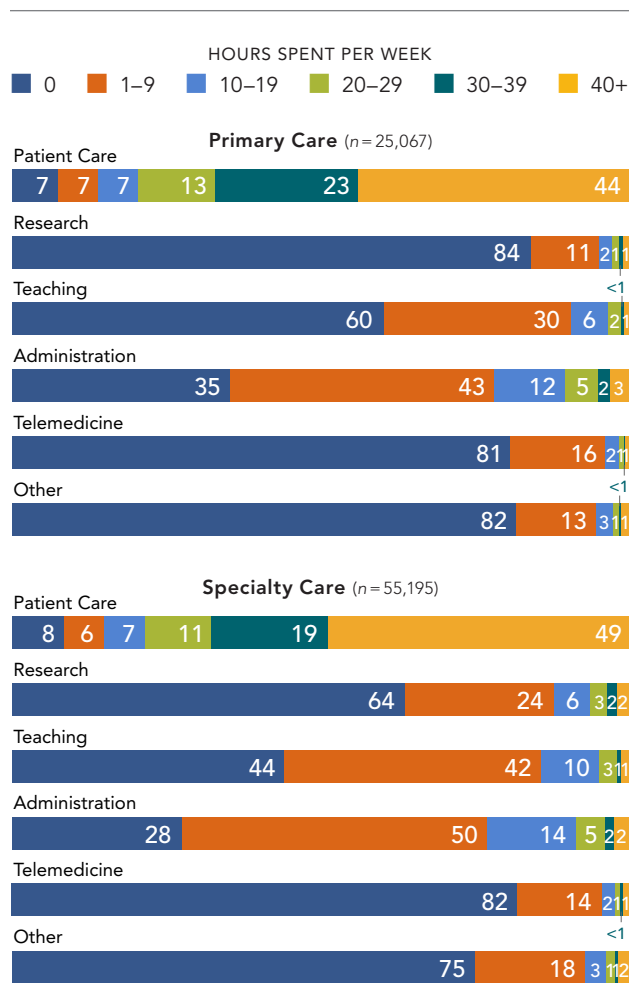
**Figure 1. Weekly Hours Spent on Selected Activities by Licensed Physicians, 2015**



Note: Physicians who did not answer the survey question about a particular professional activity were not included in the estimate of mean hours spent on that activity per week.

**Other activities.** While patient care was the primary activity of most physicians, they also reported hours spent on other activities such as research, teaching, and administration (Table 2). Over half reported spending time on administrative activities, with about 18% spending 10 or more hours per week on them. Approximately 22% reported spending one or more hours per week on research and nearly 40% spent one or more hours

**Figure 2. Percentage of Licensed Physicians Who Spent Time on Selected Activities, by Hours Per Week, Primary Care vs. Specialty Care, 2015**



Notes: Labels are %. Segments may not sum 100% due to rounding.

Source (Figures 1 and 2): Analysis of Medical Board of California data by the Philip R. Lee Institute for Health Policy Studies, University of California, San Francisco.

**Table 2. Percentage of Licensed Physicians Who Spent Time on Selected Activities, by Hours Per Week, 2015 (N=81,003)**

	HOURS PER WEEK						DID NOT ANSWER
	0	1-9	10-19	20-29	30-39	40+	
Patient care	8.0%	6.2%	6.3%	10.8%	19.4%	45.3%	3.9%
Administration	24.3%	38.4%	10.8%	3.9%	1.3%	2.1%	19.1%
Research	50.9%	14.7%	3.4%	1.6%	0.9%	1.2%	27.3%
Teaching	37.9%	29.3%	6.5%	2.0%	0.5%	0.8%	23.0%
Telemedicine	51.2%	8.9%	1.4%	0.5%	0.2%	0.6%	37.2%
Other	46.1%	9.7%	1.9%	0.8%	0.3%	0.9%	40.3%

Source: Analysis of Medical Board of California data by the Philip R. Lee Institute for Health Policy Studies, University of California, San Francisco.

on teaching. Specialist physicians were more likely than primary care physicians to report spending at least one hour per week on research, teaching, or administration (Figure 2).

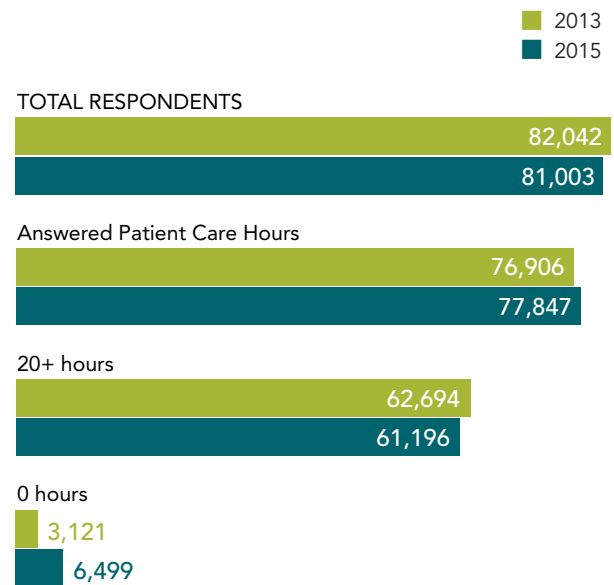
**Change in activities from 2013 to 2015.** From 2013 to 2015, the number of active licensed California physicians who had completed training and answered the mandatory survey decreased by 1.3% from 82,042 to 81,003, while the number who answered the patient care hours question increased 1.2% from 76,906 to 77,847 (Figure 3). The number of physicians who reported practicing patient care for at least 20 hours per week declined 2.4% from 62,694 to 61,196. Over the same period, the number of physicians reporting no hours spent on patient care doubled from 3,121 to 6,499 physicians.

### Specialty Distribution

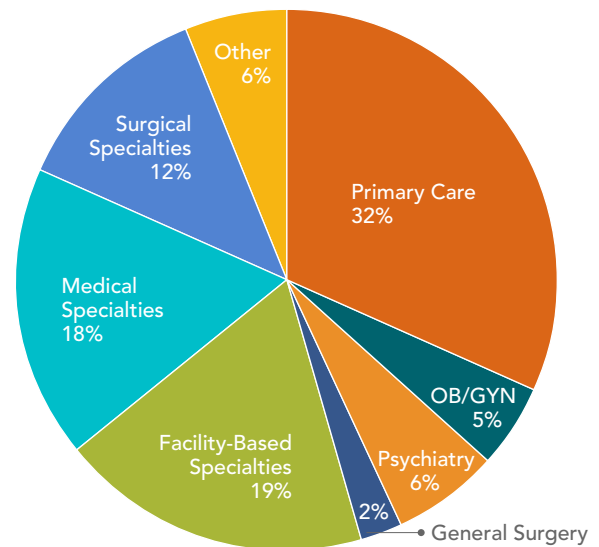
**Supply of primary and specialty care MDs.** Thirty-two percent (19,497) of active patient care physicians reported practicing in a primary care specialty, defined as family medicine, general internal medicine, or pediatrics (Figure 4). Another 32% practiced in medical specialties, surgical specialties, and general surgery. Nineteen percent practiced in facility-based specialties, which consist of emergency medicine physicians, anesthesiologists, pathologists, and radiologists. In 2015, there were 50 primary care physicians and 104 specialists per 100,000 persons in the state.

Furthermore, the development of hospitalist practices and the number of hospital-based physicians has risen in recent years.<sup>2</sup> In the supplemental survey, approximately 2.3% of family physicians, 8.8% of general internal medicine physicians, and 4.7% of pediatricians in California reported practicing in a hospital over 90% of the time. This suggests that the total number of primary care physicians based on specialty alone may be overestimated, particularly among general internists.

**Figure 3. Hours Per Week Spent on Patient Care by Licensed Physicians, 2013 vs. 2015**



**Figure 4. Supply of Physicians, by Specialty, 2015**



Note: OB/GYN is obstetrics and gynecology.

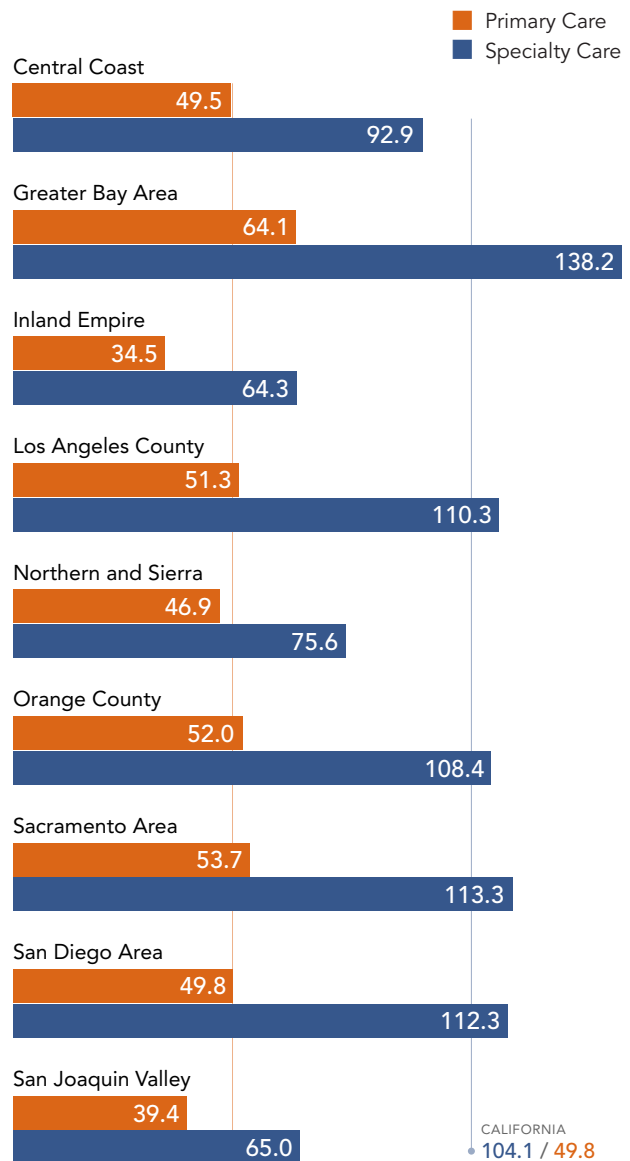
Source (Figures 3 and 4): Analysis of Medical Board of California data by the Philip R. Lee Institute for Health Policy Studies, University of California, San Francisco.

### Primary and specialty care physicians by region.

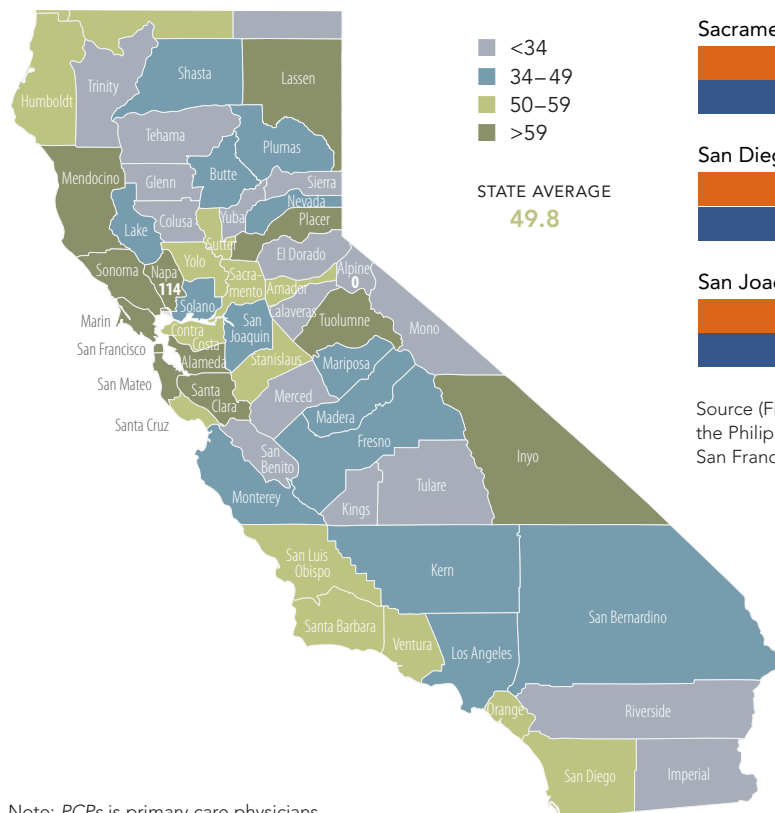
The supply of physicians who spent at least 20 hours per week on patient care varied across regions and by specialty (Figure 5; for detailed counts by region, see Appendix G). The Inland Empire and San Joaquin Valley regions had the lowest numbers of primary care and specialty physicians per 100,000 people.

The distribution of physicians varied by county. The supply of primary care physicians per 100,000 people ranged from a low of 0 in Alpine County to a high of 113 in Napa County (see Figure 6). Similarly, the supply of specialty physicians per 100,000 people ranged from a low of 0 in Alpine County and Sierra County to a high of 234 in Napa County. Several counties had no or few physicians in specific specialties, including geriatric medicine, endocrinology, psychiatry, pulmonary care, and rheumatology (see detailed data file on [chcf.org](http://chcf.org)<sup>3</sup> for counts of all specialties by county). Not having any physicians in a specialty in a county poses a barrier to access, especially in California, where many counties cover large geographic areas.

**Figure 5. Physicians per 100,000 Residents, by Region  
Primary Care vs. Specialty Care, 2015**



**Figure 6. PCPs per 100,000 Residents, by County, 2015**



Note: PCPs is primary care physicians.

Source (Figures 5 and 6): Analysis of Medical Board of California data by the Philip R. Lee Institute for Health Policy Studies, University of California, San Francisco.

## Physician Demographics

**Age.** Physicians over age 60 accounted for 36% of the 77,847 nontrainee licensed physicians with practice locations in California who provided information about hours spent on patient care. Among active patient care physicians, 27% were over age 60. In the Northern and Sierra region, older physicians accounted for 37% of active patient care physicians (Figure 7).

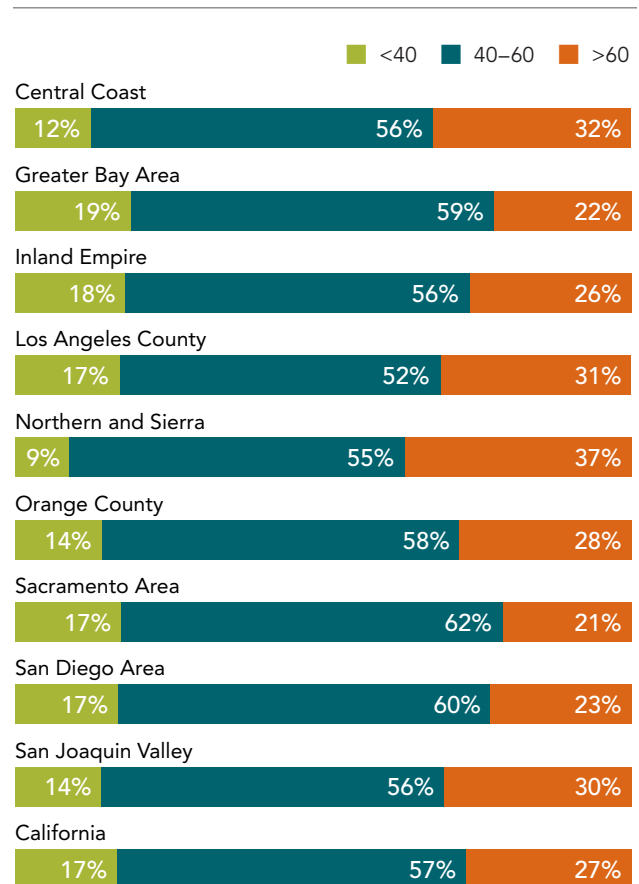
**Change from 2013 to 2015.** Over the two-year period, the percentage of survey respondents practicing in California over age 60 increased from 31% to 36%. Among these physicians, the percentage engaged in active patient care decreased by eight percentage points. The percentage of active patient care physicians in the younger age groups remained stable over the same period.

**Gender.** In 2015, 33% of survey respondents were female. The age distributions of male and female physicians were quite different; this is largely due to the growth in the number of women entering medical school since the 1970s. Among nontrainee physicians in California who provide patient care at least 20 hours per week, 34% of male physicians were over age 60, versus only 14% of female physicians (Figure 8).

A slightly higher percentage of females than males were engaged in active patient care (81% vs. 78%).

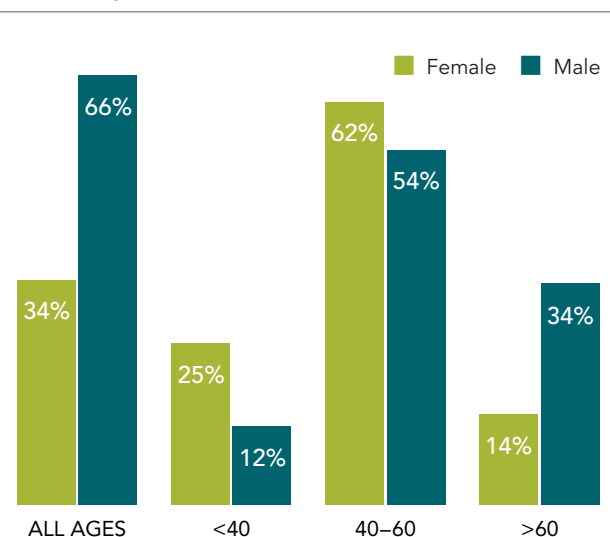
Within each age group, male and female physicians in California were engaged in active patient care (i.e., provided patient care 20 or more hours per week) at similar rates (Figure 9, page 9). The largest differential was among those age 40 to 60. In this age group, 90% of male physicians were engaged in active patient care, versus 83% of female physicians. For both genders, the proportion of physicians who provided patient care 20 or more hours per week was substantially lower among physicians over 60 than it was among younger physicians.

Figure 7. Age of Active Patient Care Physicians by Region, 2015



Note: Segments may not sum 100% due to rounding.

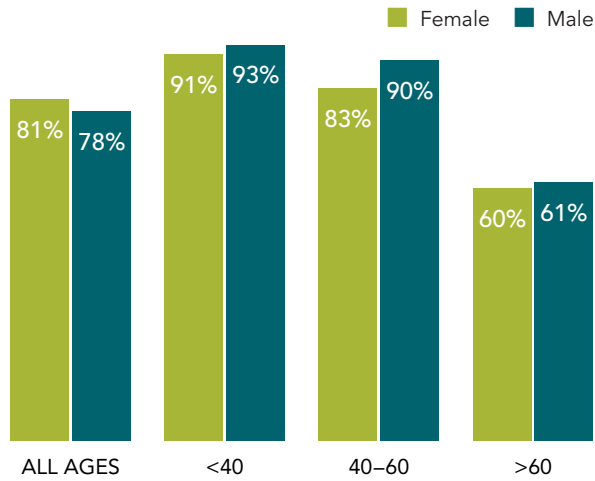
Figure 8. Age Distribution of Active Patient Care MDs by Gender, 2015



Source (Figures 7 and 8): Analysis of Medical Board of California data by the Philip R. Lee Institute for Health Policy Studies, University of California, San Francisco.



**Figure 9. Percentage of Female and Male MDs Engaged in Active Patient Care, by Age, 2015**



Source: Analysis of Medical Board of California data by the Philip R. Lee Institute for Health Policy Studies, University of California, San Francisco.

**Table 3. Race/Ethnicity of Active Patient Care MDs and State Population, 2015**

	# OF MDs	% OF MDs	% STATE POPULATION
American Indian / Alaska Native	72	0.1%	0.4%
Asian	16,892	27.6%	13.6%
African American	1,556	2.5%	5.9%
Latino	3,097	5.1%	38.4%
Middle Eastern	1,696	2.8%	N/A
Multiracial/ethnic	209	0.3%	2.8%
White	19,673	32.1%	38.7%
Other	1,658	2.7%	0.2%
Decline to state*	8,779	14.3%	N/A
Did not answer race/ethnicity question*	7,564	12.4%	N/A
<b>Total</b>	<b>61,196</b>	<b>100.0%</b>	

\*A substantial number of physicians are not accounted for among the listed groups because 14% declined to report their race/ethnicity and 12% did not answer the survey question about race/ethnicity.

Note: The survey included an option to self-identify as *Middle Eastern* with unspecified nationality or ethnicity. The ACS does not have a corresponding Middle Eastern response option. For California's population, *multiracial/ethnic* was derived from combining multiple single-item responses (whereas the physician survey allowed respondents to select all response options).

Sources: Analysis of Medical Board of California data and American Community Survey (ACS) data by the Philip R. Lee Institute for Health Policy Studies, University of California, San Francisco.

**Race and ethnicity.** The racial and ethnic breakdown of California's physicians differed considerably from that of the overall population (Table 3).

Compared to the state population, the physician population was composed of a higher percentage of Asians (28% of physicians and 14% of population). The percentage of Latino physicians was 33 percentage points lower than that of the Latino state population (5% of physicians versus 38% of the population). African Americans accounted for 6% of the population but 3% of physicians.

The California Office of Statewide Health Planning and Development defines the following Asian ethnic groups as "underrepresented" in medicine: Cambodian, Thai, Vietnamese, and Other Southeast Asian.<sup>4</sup> The mandatory survey data indicated that 7% of California's physicians were "underrepresented" Asian ethnicities, Pacific Islanders, or Native Hawaiians.

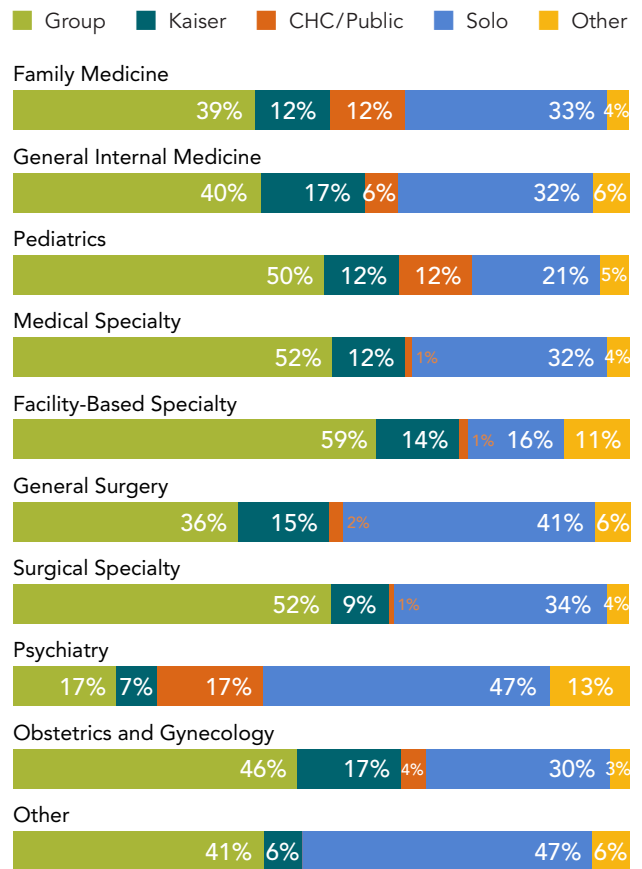
**The racial and ethnic breakdown of California's physicians differed considerably from that of the overall population**

## Practice Types

In 2015, 5,117 physicians (approximately 8% of all active patient care physicians) completed the voluntary supplemental survey that included questions about practice type. Of those, 25% were in solo practice and 64% were in a group practice or Kaiser Permanente. Practice type varied by physician age. Forty-two percent of physicians over 60 reported being in solo practice, whereas 61% of those under 40 reported working in a group practice and 18% practiced in Kaiser Permanente (Figure 10). A higher percentage of younger physicians worked in community health centers and public clinics. A slightly higher percentage of older physicians practiced in other types of settings, which includes VA and military sites.

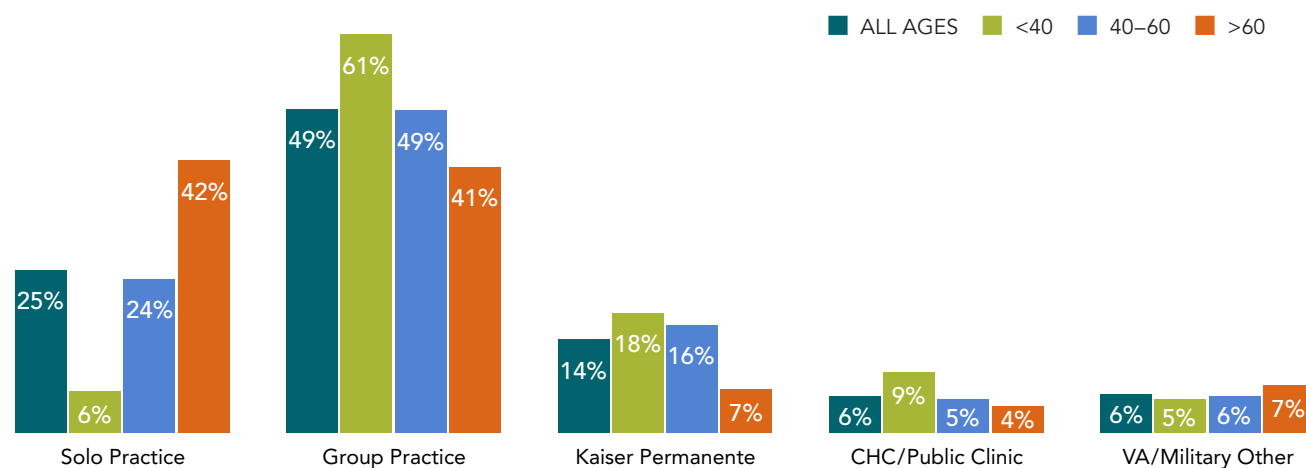
Practice types varied by specialty (Figure 11). Psychiatrists were the most likely to be in solo practice or to practice in a community health center or public clinic and least likely to be in a group practice compared to other specialties. Facility-based specialists, such as emergency medicine physicians, were the most likely to be in group practice.

**Figure 11. Practice Types of Active Patient Care Physicians by Major Specialty Category, 2015** (n=5,082)



Notes: CHC/Public is community health center or public clinic. The number of observations for Figure 11 is lower than the number of observations for Figure 10 because the specialty of 35 MDs could not be identified.

**Figure 10. Practice Types of Active Patient Care Physicians, by Age, 2015** (n=5,117)



Source (Figures 10 and 11): Analysis of Medical Board of California data by the Philip R. Lee Institute for Health Policy Studies, University of California, San Francisco.

## Physician Participation in Medi-Cal

The voluntary supplemental survey also asked physicians questions about the types of health insurance they accept. Figure 12 presents information on the percentages of physicians who had patients in their practices by type of insurance coverage. Physicians were most likely to have patients with private insurance coverage in their practices, followed by patients with Medicare coverage. Only 62% of primary care physicians and 64% of specialists had any Medi-Cal beneficiaries in their practices.

In 2015, California physicians were less likely to accept new Medi-Cal patients than patients with Medicare or private health insurance (Figure 13). Only 55% of primary care physicians and 62% of specialists accepted new Medi-Cal patients. Conversely, physicians were more likely to accept new Medi-Cal patients than new uninsured patients. One in 3 primary care physicians and 4 in 10 specialists accepted new patients who were uninsured. The extent to which physicians accept new patients affects the ability of patients who are newly insured, or who switch from one type of health insurance to another, to find a physician who will care for them.

**In 2015, California physicians were less likely to accept new Medi-Cal patients than patients with Medicare or private health insurance. Conversely, physicians were more likely to accept new Medi-Cal patients than new uninsured patients.**

Figure 12. Physicians with Patients in Practice by Coverage Type, 2015

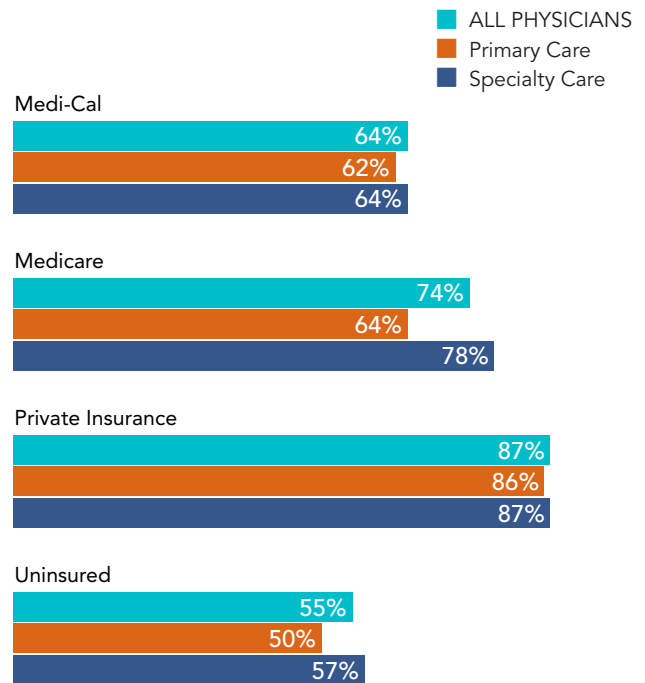
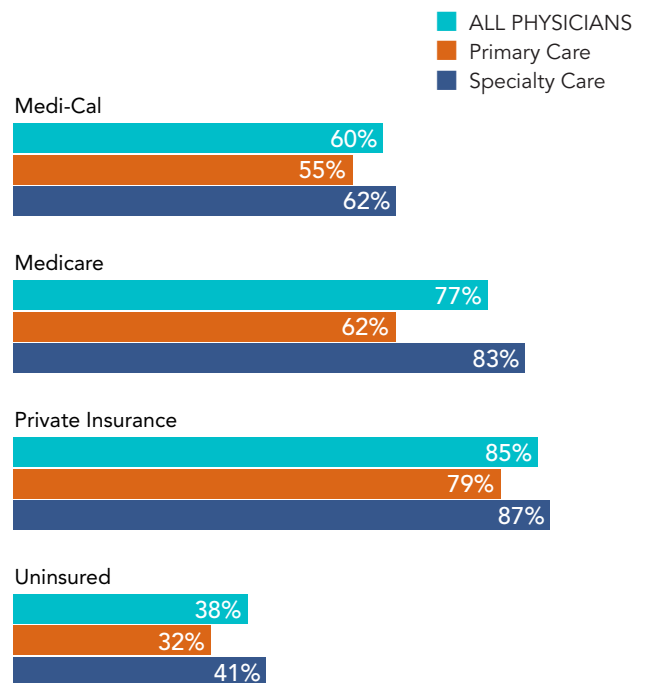


Figure 13. Physicians Accepting New Patients by Payer, 2015



Source (Figures 12 and 13): Analysis of Medical Board of California data by the Philip R. Lee Institute for Health Policy Studies, University of California, San Francisco.

## Conclusions

The analysis of Medical Board of California mandatory survey data provides an overview of the supply of physicians in the state as well as detail on their distribution across active patient care, specialty care, and the regions where they practice.

### Supply of Active Patient Care Physicians

**Less than half of all physicians with California medical licenses could be identified as providing patient care for 20 or more hours per week (i.e., active patient care).** Current totals of medical licenses overestimate the supply of physicians who are available to provide patient care to the state's population. Of physicians who had active California license in 2015, 26,000 were not located in California. Out-of-state physicians may retain California licenses for many reasons, and can include those who completed training in California but relocated to practice elsewhere, military service members stationed in other locales, and physicians who previously practiced in the state who moved but wished to retain licensure. Among those located in California who were not in training, most reported providing care at least one hour per week. Although the total number of physicians with California licenses increased from 2013 to 2015, the number engaged in active patient care declined from 62,694 to 61,196.

**The number of physicians who did not provide any patient care increased between 2013 and 2015.** The number of active licensed physicians who reported spending no hours per week on patient care increased 108% from 3,121 in 2013 to 6,499 in 2015.

### Distribution of Physician Specialties

**The distributions of primary and specialty care physicians were highly uneven across regions.** The Inland Empire and San Joaquin Valley regions had 40% fewer primary care physicians per capita than the Greater Bay Area, and less than half as many specialists per capita. Previous research has found that nurse practitioners (NPs) and physician assistants (PAs) fill some of the gaps in primary care physician supply, especially in regions that have low ratios of primary care physicians to population. In California, 52% of NPs and 26% of PAs provided primary care.<sup>5</sup>

The Northern and Sierra, San Joaquin Valley, and Inland Empire regions had particularly low supplies of active patient care physicians across multiple specialties. Not surprisingly, people from these counties also reported substantial difficulty in accessing care. In the Northern and Sierra region, an estimated 10% and 20% of adults, respectively, had difficulty finding primary and specialty care in 2015.<sup>6</sup> In the Greater Bay Area, only 6% and 10% reported similar challenges. Prior analyses of the Medical Board data have documented an ongoing low physician supply in rural areas in the state.<sup>7</sup>

### Demographics of California Physicians

**Declining hours spent on patient care paralleled the aging of the physician workforce.** The number of physicians responding to the Medical Board's mandatory survey who were age 60 or older increased from 24,567 in 2013 to 29,082 in 2015. Consistent with ongoing state and national trends, California physicians age 60 or older provided fewer hours of patient care than younger physicians, and some discontinued all patient care activities. In California, physicians over age 60 accounted for 90% of physicians who provided zero hours of patient care per week.

**Gender parity in the physician workforce did not appear to drive the decline in the supply of active patient care physicians.** Contrary to past concerns that the increasing number of female physicians would substantially reduce the supply of physicians providing patient care,<sup>8</sup> similar proportions of male and female physicians in California met the definition of active patient care. Compared to male physicians, female physicians were less likely to report spending 40+ hours per week on patient care, but were more likely to report spending 20 to 39 hours per week. Of physicians who did not provide any patient care, the majority were male, likely because males constitute a much higher percentage of older physicians.

**The proportion of active patient care physicians who were members of underrepresented minority groups was substantially lower than the state's population, particularly Latinos and African Americans.** Latino physicians comprised only 5% of the active patient care physician supply, even though 38% of California residents were Latino in 2015.<sup>9</sup> Whereas 6% of state residents reported being African American, only 3% of active



patient care physicians did. Only 9% of Californians who entered medical school during the 2017–2018 academic year were Latino and only 4% were African American.<sup>10</sup> Substantial underrepresentation among physicians is associated with ongoing challenges in access to care for minorities, irrespective of insurance or socioeconomic status.<sup>11,12</sup>

## Practice Types

**Younger physicians elected group practice settings over solo practice.** Nearly 80% of physicians under age 40 practiced in a group practice or Kaiser Permanente, compared to less than half of physicians over 60. This is consistent with historical and national trends. Younger physicians have gravitated toward larger practices for several benefits, including reduced call schedules, increased flexibility in working hours, and improved information technology.<sup>13</sup>

**Practice type varied by specialty.** Sixty percent of psychiatrists reported practicing in solo and “other” settings, versus 25% of pediatricians. Among the major specialty categories, psychiatrists also had the lowest percentage practicing in group practice settings (17%). Practice setting differences carry implications for access to care: In additional analyses from the supplemental survey, nearly three-quarters of psychiatrists in solo practice reported that none of their patients were covered by Medi-Cal.

## Physician Participation in Medi-Cal

**Physicians were more likely to accept patients with any type of health insurance than uninsured patients.** In 2015, only 50% of primary care physicians and only 57% of specialists had any uninsured patients in their practices.

**Physicians were less likely to have any Medi-Cal patients in their practices than patients with Medicare or private health insurance.** Sixty-two percent of primary care physicians had any Medi-Cal patients in their practices, whereas 64% had Medicare patients, and 86% had privately insured patients. For specialists, the corresponding percentages were 64%, 78%, and 87%, respectively.

**Patterns of acceptance of new patients were similar.** Physicians were less likely to accept any new uninsured patients in their practices than they were to accept new

patients with any type of health insurance. However, they were also less likely to accept new Medi-Cal patients than to accept new patients with Medicare or private health insurance. Sixty percent of physicians accepted new Medi-Cal patients. The corresponding percentages for new Medicare patients and new patients with private health insurance were 77% and 85%, respectively.

## Limitations

This study has limitations related to the data and design. First, the data were derived from physician self-reports. The actual amount of time spent providing patient care and performing other professional activities may differ. Furthermore, the mandatory survey only asks that respondents report hours spent on an activity; counts are not equivalent to access. Second, due to revisions in the survey instrument across years, change over time could not be assessed for several items, such as physician-reported specialty. Third, this study was limited to physicians with doctorates of medicine. Doctors of osteopathic medicine were not included. The study also did not assess whether physician capacity was extended by NPs or PAs, or broader multidisciplinary care teams that include registered nurses, medical assistants, and/or other personnel. Fourth, the description of the racial/ethnic composition of the physician workforce was incomplete because more than 26% of physicians did not report their race/ethnicity. Fifth, generalizability of analysis of practice types and physician acceptance of Medi-Cal and uninsured patients was limited because the supplemental survey represents a small percentage (8%) of all patient care physicians. Although a quasi-random selection method was used, response rates differed by age group, with response rates of 50.2% over age 60, 27.4% for ages 40 to 60, and 14% under age 40.

Lastly, the Medical Board’s mandatory survey does not specify what constitutes “patient care.” In the survey, telehealth was listed as a separate item, although that would likely fall under the broader category of patient care. A recent study using electronic medical records found that physicians spend 50% of their time on office visits and the remainder on electronic documentation and communication.<sup>14</sup> Physicians may differ on their perceptions as to whether these latter activities constitute “patient care.” In addition, many physicians practice collaboratively with nurse practitioners or physician assistants, which may lead them to provide more “patient care” than physicians who see only their panel of patients.

## Recommendations

The supply of physicians in California may not be able to keep pace with growth in the state's demand for medical care due to population growth and aging. As with the general population, the population of physicians is aging, and older physicians will likely continue to scale back on patient care activities. Although the future of health insurance coverage remains unclear, coverage does not confer access without a health care workforce to provide care. Policymakers, providers, and plans should invest in strategies that both bolster the number of physicians and extend their services in innovative ways.

To address the challenges in the supply of physicians in California, the authors recommend the following:

- ▶ **Increase funding to expand undergraduate medical education (i.e., medical school), particularly in underserved areas.** California has a higher ratio of medical school applicants to medical school admission slots than most other states.<sup>15</sup> Increasing the number of medical students could help increase the supply of physicians because over 60% of California medical students remain in the state.<sup>16</sup> Several new medical schools have opened in recent years and several more are planned. The combined efforts of these schools would help to boost the total supply of physicians. Increased funding should be targeted particularly for recruiting students who are interested in caring for underserved populations and who are interested in practicing in specialties that are projected to experience shortages, such as family medicine, general internal medicine, general pediatrics, and psychiatry.<sup>17,18</sup>
- ▶ **Increase funding to expand graduate medical education (i.e., residency and fellowship programs), particularly in specialties with projected shortages.** Residency programs are another important source of physicians; 70% of physicians who completed residency in California remain in the state to practice.<sup>19</sup> However, in 2016, California ranked 31<sup>st</sup> among the 50 states with respect to the ratio of residents and fellows per 100,000 population. Also, California ranked 35<sup>th</sup> in the rate of growth of residents and fellows between 2006 and 2016. Despite increases in federal and state support for primary care training, graduate medical education in California continues to be weighted toward specialty fellowships.<sup>20</sup> Investment in residency programs should be targeted to primary care specialties, psychiatry, and other specialties in which shortages are projected.<sup>21,22</sup> The state budget for 2017–18 and the governor's budget proposal for 2018–19 included \$33 million for primary care residency programs. The state will need to maintain funding for primary care residency programs at this level to meet the state's needs and should explore options for obtaining funding from other sources, such as Medi-Cal and Medicare.
- ▶ **Increase funding for financial incentives to encourage both primary care and specialty physicians to practice in underserved areas.** Scholarship and loan repayment programs have demonstrated success in both recruitment and retention of primary care physicians in underserved areas, particularly rural areas.<sup>23</sup>
- ▶ **Support opportunities for international medical graduates to practice in underserved areas of the state.** Maintaining policies and mechanisms to support international medical graduates (IMGs) is critical for meeting the health care needs of California's population. Nationwide, IMGs made up 18.5% of generalist physicians in rural areas, and a higher percentage practice in rural Health Professions Shortage Areas.<sup>24</sup> In California, IMGs constituted 21.8% of primary care physicians in nonmetropolitan counties. Program administrators have reported that recent shifts in immigration policy have raised challenges in hiring, recruiting, and retaining IMGs for residency and fellowship positions.<sup>25</sup> Policymakers should continue advocacy for visa programs that allow IMGs to train and remain in the state.<sup>26</sup>
- ▶ **Increase investments in programs that address diversity of the physician workforce.** Underrepresentation in medical schools is attributed to multiple factors, including inequities in K–12 education, a lack of support and mentorship in colleges, and inadequate prioritization and institutional commitment to diversity.<sup>27</sup> Multiple programs across the pipeline, from K–12 programming, community colleges, undergraduate recruitment, post-baccalaureate, and undergraduate medical education have been shown to increase both diversity and the number of physicians practicing in underserved areas.<sup>28</sup>

► **Invest in technologies that can maximize scarce physician resources, especially for rural areas.**

Greater investment in training and technology to expand telehealth via electronic advice referrals, virtual consults, and care navigators / primary care liaisons would expand access to primary and specialty care.<sup>29</sup> For specialty care in particular, reimbursement for videoconferencing, mobile therapy technologies, and peer providers would alleviate a lack of specialists.

► **Provide training, support, and incentives for team-based care.**

Care teams that consist of several types of personnel — including nurse practitioners, physician assistants, and community-based support staff such as care coordinators and community health workers — can expand the number of patients that primary care physicians can serve. Primary care physicians should receive training on both team management (leadership of other health care personnel) and panel management (population health management). Reimbursement mechanisms should support care delivered by teams that include several types of members. To facilitate adoption of these models, community health centers and other providers who have experience in team models could facilitate learning collaboratives with private providers. These efforts can also be adapted for specialty care; for example, physician assistants can extend the practices of general surgeons by providing initial evaluations, assistance in the operating room, and follow-up care.<sup>30</sup>

## Appendix A. Methodology

The Medical Board of California requires physicians to reapply for MD licenses every two years. Physicians undergoing relicensure are required to complete a mandatory survey, which includes questions regarding their demographics, practice location, professional activities, primary and secondary specialty, board certifications, and whether they have completed residency and/or fellowship training (see [Appendix B](#) for the mandatory survey instrument).

In addition to the survey for all re-applicants, the Medical Board, in partnership with the University of California, San Francisco, also administered a voluntary supplemental survey to a sample of physicians who were due for renewal in June and December 2015. Because the physicians were selected by birth month rather than any practice-related characteristics, the sample approximates a random sample. Physicians were eligible for inclusion in analyses of responses to the supplemental survey if they had an active California license, practiced in California, had completed training, and provided patient care for at least 20 hours per week. These inclusion criteria ensured that the analysis focused on physicians whose primary professional activity was providing patient care to Californians (see [Appendix C](#) for the supplemental survey instrument). Among physicians who met the eligibility criteria, the response rate for the supplemental survey was 63% in 2013 and 22% in 2015.

The lower response rate in 2015 was likely due to a change in the mechanism by which the Medical Board administered the online version of the supplemental survey. In 2013, the supplemental survey was embedded in the same software platform as the licensure renewal form and the mandatory survey, making it easy for physicians to complete the supplemental survey with little additional effort. In 2015, physicians had to first submit the online renewal applications and mandatory survey responses and then go to a different software platform and re-enter some identifying information before completing the supplemental survey.

### State Physician Supply

**Assessing geographic distribution and supply.** To assess geographic distribution, the study used respondent practice zip codes to count the number of physicians in the state and in each California county. If no practice zip code was available (3%), the zip code for the respondent's primary mailing address on file at the Medical Board was used. Responses were aggregated by region (see [Appendix D](#) for California counties in regions). To calculate the supply of physicians per capita, the study used estimates of the state and county populations in 2015 from the US Census Bureau's American Community Survey.

### Physician Activities

**Describing physician activities.** The survey asked physicians to report the number of hours spent per week on the following activities: patient care, research, teaching, administration, telemedicine, other. Hours devoted to each activity were categorized as zero and then increasing 10-hour increments, up to 40 or more hours per week. Hours spent on patient care by age and gender were examined to assess whether there were age or gender differences in hours spent on patient care.

**Enumerating active patient care physicians.** The American Medical Association's criteria were used to identify "active patient care" physicians as those who reported spending 20 or more hours per week on patient care.

### Specialty Distribution

**Determining physician specialty.** The survey asked physicians to report primary and secondary specialties, as well as board certifications. Physician specialty was determined by the primary specialty; if no primary was reported, then secondary specialties were used to determine specialty. If no primary or secondary specialty was reported, then reported board certifications were used to identify specialty. Among active patient care physicians, 0.4% were missing specialty information under this algorithm.



**Identifying primary care physicians.** The following specialties were categorized as primary care: family medicine (including general practice), general pediatrics, and general internal medicine (including geriatric medicine).

**Categorizing physician specialty.** The study also created a 10-category measure to describe primary care and specialty distribution in greater depth. The 10 categories were family medicine, general internal medicine, pediatrics, medical specialty, facility-based care, surgical specialty, psychiatry, obstetrics/gynecology, general surgery, and other. Facility-based care included specialties generally practiced by physicians employed in or by health care facilities, including emergency medicine, anesthesiology, radiology, and pathology. (See [Appendix F](#) for lists of the specialties included in each category.)

### Demographic Characteristics

The California Medical Board retains data on physician age and gender for all licensed physicians, independent of the mandatory survey. The mandatory survey asked respondents to identify their race and ethnicity. The self-reported responses were categorized as follows: White, African American, Latino, Middle Eastern, American Indian / Alaska Native, Asian Not Underrepresented, Asian Underrepresented / Hawaiian / Pacific Islander, Multiracial/Ethnic, and Other. Asian Not Underrepresented includes Asian subgroups in which the percentage of physicians meets or exceeds the population percentage. (See [Appendix E](#) for detailed race/ethnicity response items.)

### Practice Type

The supplemental survey included a question that asked physicians to report the organizational setting in which they practiced. Practice types were categorized as follows: solo practice, small medical partnership (2 to 9 physicians), group practice (10 to 49 physicians), large group practice including academia (50 or more physicians), Kaiser Permanente, community health center / public clinic, VA or military, or other (see [Appendix C](#) for supplemental survey instrument).

### Change Over Time

Because the Medical Board of California administers the mandatory survey every other year in conjunction with licensure renewal, responses to the 2013 survey were analyzed and compared to 2015 responses for items that remained consistent over time. For this study, hours spent on the different activities in medicine and the total number of active patient care physicians were compared. In 2015, the survey instrument included additional medical specialty items as well as board certifications, allowing more physicians to identify themselves as practicing in particular medical specialties. The survey change prevented comparison of physician supply in primary care versus medical specialties across years. Trends in physician race/ethnicity could not be assessed because response options for the question about race/ethnicity changed.

### I. Physician Survey

Are you retired?  Yes  No

**1. ACTIVITIES IN MEDICINE (Mandatory)**

Fill in one circle on each line.

Hours	None	1-9	10-19	20-29	30-39	40+
Patient Care	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> →
Telehealth	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> →
Administration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Research	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Teaching	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**2. PRACTICE LOCATIONS (Mandatory)**

If you have hours for Patient Care, enter the primary and secondary practice location(s).

Primary practice location (U.S. Only) Secondary practice location (CA Only)

Zip Code	County	Zip Code	County
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**CODES (CA County /**

01 Alameda	16 Kings	31 Placer	46 Sierra
02 Alpine	17 Lake	32 Plumas	47 Siskiyou
03 Amador	18 Lassen	33 Riverside	48 Solano
04 Butte	19 Los Angeles	34 Sacramento	49 Sonoma
05 Calaveras	20 Madera	35 San Benito	50 Stanislaus
06 Colusa	21 Marin	36 San Bernardino	51 Sutter
07 Contra Costa	22 Mariposa	37 San Diego	52 Tehama
08 Del Norte	23 Mendocino	38 San Francisco	53 Trinity
09 El Dorado	24 Merced	39 San Joaquin	54 Tulare
10 Fresno	25 Modoc	40 San Luis Obispo	55 Tuolumne
11 Glenn	26 Mono	41 San Mateo	56 Ventura
12 Humboldt	27 Monterey	42 Santa Barbara	57 Yolo
13 Imperial	28 Napa	43 Santa Clara	58 Yuba
14 Inyo	29 Nevada	44 Santa Cruz	
15 Kern	30 Orange	45 Shasta	98 Out of State

**3. CURRENT TRAINING STATUS (Mandatory)**

Residency

Fellow

Not in Training

**4a. AREAS OF PRACTICE (Mandatory)**

Please mark one primary (P) practice area and all secondary (S) practice areas.

P	S	P	S	P	S
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**4b. BOARD CERTIFICATIONS (Mandatory)**

Please mark any Board Certifications that you may have. If you have no current certifications, mark here:  None

American Board of Allergy and Immunology	American Board of Anesthesiology	<input type="radio"/> Pediatric Anesthesiology
<input type="radio"/> Allergy and Immunology	<input type="radio"/> Anesthesiology	<input type="radio"/> Sleep Medicine
	<input type="radio"/> Critical Care Medicine	
	<input type="radio"/> Hospice and Palliative Medicine	
	<input type="radio"/> Pain Medicine	

(Continued on reverse side.)

- American Board of Colon and Rectal Surgery  
 Colon and Rectal Surgery
- American Board of Dermatology  
 Dermatology  
 Clinical and Laboratory Dermatological Immunology  
 Dermatopathology  
 Pediatric Dermatology
- American Board of Emergency Medicine  
 Emergency Medicine  
 Critical Care Medicine  
 Emergency Medical Services  
 Hospice and Palliative Medicine  
 Medical Toxicology  
 Pediatric Emergency Medicine  
 Sports Medicine  
 Undersea and Hyperbaric Medicine
- American Board of Facial Plastic & Reconstructive Surgery  
 Facial Plastic & Reconstructive Surgery
- American Board of Family Medicine  
 Family Medicine  
 Adolescent Medicine  
 Geriatric Medicine  
 Hospice and Palliative Medicine  
 Sleep Medicine  
 Sports Medicine
- American Board of Internal Medicine  
 Internal Medicine  
 Adolescent Medicine  
 Advanced Heart Failure and Transplant Cardiology  
 Cardiovascular Disease  
 Clinical Cardiac Electrophysiology  
 Critical Care Medicine  
 Endocrinology, Diabetes and Metabolism  
 Gastroenterology  
 Geriatric Medicine  
 Hematology  
 Hospice and Palliative Medicine  
 Infectious Disease  
 Interventional Cardiology  
 Medical Oncology  
 Nephrology  
 Pulmonary Disease  
 Rheumatology  
 Sleep Medicine  
 Sports Medicine  
 Transplant Hepatology
- American Board of Medical Genetics  
 Clinical Biochemical Genetics
- Clinical Cytogenetics  
 Clinical Genetics (MD)  
 Clinical Molecular Genetics  
 Medical Biochemical Genetics  
 Molecular Genetic Pathology
- American Board of Neurological Surgery  
 Neurological Surgery
- American Board of Nuclear Medicine  
 Nuclear Medicine
- American Board of Obstetrics and Gynecology  
 Obstetrics and Gynecology  
 Critical Care Medicine  
 Female Pelvic Medicine and Reconstructive Surgery  
 Gynecologic Oncology  
 Hospice and Palliative Medicine  
 Maternal and Fetal Medicine  
 Reproductive Endocrinology/Infertility
- American Board of Ophthalmology  
 Ophthalmology
- American Board of Orthopaedic Surgery  
 Orthopaedic Surgery  
 Orthopaedic Sports Medicine  
 Surgery of the Hand
- American Board of Otolaryngology  
 Otolaryngology  
 Neurotology  
 Pediatric Otolaryngology  
 Plastic Surgery Within Head/Neck  
 Sleep Medicine
- American Board of Pain Medicine  
 Pain Medicine
- American Board of Pathology  
 Pathology – Anatomic/Pathology-Clinical  
 Pathology – Anatomic  
 Pathology – Clinical  
 Blood Banking/Transfusion Medicine  
 Clinical Informatics  
 Cytopathology  
 Dermatopathology  
 Neuropathology  
 Pathology – Chemical  
 Pathology – Forensic  
 Pathology – Hematology  
 Pathology – Medical Microbiology  
 Pathology – Molecular Genetic  
 Pathology – Pediatric
- American Board of Pediatrics  
 Pediatrics  
 Adolescent Medicine  
 Child Abuse Pediatrics  
 Developmental-Behavioral Pediatrics  
 Hospice and Palliative Medicine  
 Medical Toxicology  
 Neonatal-Perinatal Medicine  
 Neurodevelopmental Disabilities  
 Pediatric Cardiology  
 Pediatric Critical Care Medicine  
 Pediatric Emergency Medicine  
 Pediatric Endocrinology  
 Pediatric Gastroenterology  
 Pediatric Hematology-Oncology  
 Pediatric Infectious Diseases  
 Pediatric Nephrology  
 Pediatric Pulmonology  
 Pediatric Rheumatology  
 Pediatric Transplant Hepatology  
 Sleep Medicine  
 Sports Medicine
- American Board of Physical Medicine and Rehabilitation  
 Physical Medicine and Rehabilitation  
 Brain Injury Medicine  
 Hospice and Palliative Medicine  
 Neuromuscular Medicine  
 Pain Medicine  
 Pediatric Rehabilitation Medicine  
 Spinal Cord Injury Medicine  
 Sports Medicine
- American Board of Plastic Surgery  
 Plastic Surgery  
 Plastic Surgery Within Head/Neck  
 Surgery of the Hand
- American Board of Preventive Medicine  
 Aerospace Medicine  
 Occupational Medicine  
 Public Health and General Preventive Medicine  
 Clinical Informatics  
 Medical Toxicology  
 Undersea and Hyperbaric Medicine
- American Board of Psychiatry and Neurology  
 Psychiatry  
 Neurology  
 Neurology with Special Qualification in Child Neurology  
 Addiction Psychiatry  
 Brain Injury Medicine  
 Child and Adolescent Psychiatry  
 Clinical Neurophysiology  
 Epilepsy

(Continued on Page 5.)

- |   |   |   |
|---|---|---|
| <input type="radio"/> Forensic Psychiatry             | <input type="radio"/> Nuclear Radiology                     | <input type="radio"/> Hospice and Palliative Medicine                   |
| <input type="radio"/> Geriatric Psychiatry            | <input type="radio"/> Pediatric Radiology                   | <input type="radio"/> Pediatric Surgery                                 |
| <input type="radio"/> Hospice and Palliative Medicine | <input type="radio"/> Vascular and Interventional Radiology | <input type="radio"/> Surgery of the Hand                               |
| <input type="radio"/> Neurodevelopmental Disabilities |   | <input type="radio"/> Surgical Critical Care                            |
| <input type="radio"/> Neuromuscular Medicine          |   |   |
| <input type="radio"/> Pain Medicine                   | American Board of Sleep Medicine                            | American Board of Thoracic Surgery                                      |
| <input type="radio"/> Psychosomatic Medicine          | <input type="radio"/> Sleep Medicine                        | <input type="radio"/> Thoracic and Cardiac Surgery                      |
| <input type="radio"/> Sleep Medicine                  |   | <input type="radio"/> Congenital Cardiac Surgery                        |
| <input type="radio"/> Vascular Neurology              | American Board of Spine Surgery                             |   |
|   | <input type="radio"/> Spine Surgery                         | American Board of Urology   |
|   |   | <input type="radio"/> Urology   |
| American Board of Radiology                           | American Board of Surgery                                   | <input type="radio"/> Female Pelvic Medicine and Reconstructive Surgery |
| <input type="radio"/> Diagnostic Radiology            | <input type="radio"/> Surgery                               | <input type="radio"/> Pediatric Urology                                 |
| <input type="radio"/> Radiation Oncology              | <input type="radio"/> Vascular Surgery                      |   |
| <input type="radio"/> Medical Physics                 | <input type="radio"/> Complex General Surgical Oncology     |   |
| <input type="radio"/> Hospice and Palliative Medicine |   |   |
| <input type="radio"/> Neuroradiology                  |   |   |

5. POSTGRADUATE TRAINING *Years completed.*     0    1    2    3    4    5    6    7    8    9+

6. CULTURAL BACKGROUND

Select one or more that best describe your cultural background.

- |  |                                     |  |  |
|--|-------------------------------------|--|--|
| <input type="radio"/> African          | <input type="radio"/> Fijian        | <input type="radio"/> Mexican                | <input type="radio"/> South American     |
| <input type="radio"/> African American | <input type="radio"/> Filipino      | <input type="radio"/> Middle Eastern         | <input type="radio"/> Taiwanese          |
| <input type="radio"/> Alaskan Native   | <input type="radio"/> Guamanian     | <input type="radio"/> Native American        | <input type="radio"/> Thai               |
| <input type="radio"/> American Indian  | <input type="radio"/> Hawaiian      | <input type="radio"/> Other Asian            | <input type="radio"/> Tongan             |
| <input type="radio"/> Black            | <input type="radio"/> Indian        | <input type="radio"/> Other Hispanic         | <input type="radio"/> Vietnamese         |
| <input type="radio"/> Cambodian        | <input type="radio"/> Indonesian    | <input type="radio"/> Other Pacific Islander | <input type="radio"/> White              |
| <input type="radio"/> Central American | <input type="radio"/> Japanese      | <input type="radio"/> Pakistani              |  |
| <input type="radio"/> Chinese          | <input type="radio"/> Korean        | <input type="radio"/> Puerto Rican           | <input type="radio"/> Other (not listed) |
| <input type="radio"/> Cuban            | <input type="radio"/> Laotian/Hmong | <input type="radio"/> Samoan                 |  |
| <input type="radio"/> European         | <input type="radio"/> Malaysian     | <input type="radio"/> Singaporean            | <input type="radio"/> Decline to State   |

7. FOREIGN LANGUAGE PROFICIENCY

In addition to English, indicate additional languages in which you are proficient.

- |  |   |  |   |
|--|---|--|---|
| <input type="radio"/> African Languages      | <input type="radio"/> Hebrew                | <input type="radio"/> Panjabi (Punjabi)      | <input type="radio"/> Ukrainian           |
| <input type="radio"/> American Sign Language | <input type="radio"/> Hindi                 | <input type="radio"/> Persian (Farsi)        | <input type="radio"/> Urdu                |
| <input type="radio"/> Amharic                | <input type="radio"/> Hmong                 | <input type="radio"/> Polish                 | <input type="radio"/> Vietnamese          |
| <input type="radio"/> Arabic                 | <input type="radio"/> Hungarian             | <input type="radio"/> Portuguese             | <input type="radio"/> Xiang Chinese       |
| <input type="radio"/> Armenian               | <input type="radio"/> Ilocano               | <input type="radio"/> Russian                | <input type="radio"/> Yiddish             |
| <input type="radio"/> Cantonese              | <input type="radio"/> Indonesian            | <input type="radio"/> Samoan                 | <input type="radio"/> Yoruba              |
| <input type="radio"/> Croatian               | <input type="radio"/> Italian               | <input type="radio"/> Scandinavian Languages |   |
| <input type="radio"/> Fijian                 | <input type="radio"/> Japanese              | <input type="radio"/> Serbian                | <input type="radio"/> Other Chinese       |
| <input type="radio"/> Formosan (Amis)        | <input type="radio"/> Korean                | <input type="radio"/> Spanish                | <input type="radio"/> Other Non-English   |
| <input type="radio"/> French                 | <input type="radio"/> Lao                   | <input type="radio"/> Swahili                | <input type="radio"/> Other Sign Language |
| <input type="radio"/> French Creole          | <input type="radio"/> Mandarin              | <input type="radio"/> Tagalog                | <input type="radio"/> Other (not listed)  |
| <input type="radio"/> German                 | <input type="radio"/> Mien                  | <input type="radio"/> Telugu                 |   |
| <input type="radio"/> Greek                  | <input type="radio"/> Mon-Khmer (Cambodian) | <input type="radio"/> Thai                   | <input type="radio"/> Decline to state    |
| <input type="radio"/> Gujarati               | <input type="radio"/> Navajo                | <input type="radio"/> Tonga                  | <input type="radio"/> None                |
|  |   | <input type="radio"/> Turkish                |   |

8. WEB SITE PROFILE

Do you want the following information included in your physician profile on the Medical Board's Web site?

Cultural Background  Yes  NO    Foreign Language Proficiency  Yes  NO    Gender  Yes  No

9. E-MAIL ADDRESS

WILL NOT BE RELEASED TO THE PUBLIC. Please print e-mail address below.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

(Continue to Renewal Application on reverse side.)



## Appendix C. California Medical Board Supplemental Survey Instrument

Dear Physician,

The University of California, San Francisco (UCSF) and its team of experienced researchers, with the assistance of the Medical Board of California (MBC), is seeking information regarding physician practices in California. Your responses to these questions are critical in forming public policy. Your participation in this endeavor is voluntary and the information will be treated confidentially and will not affect the timing or any other aspect of your license renewal. The supplied information will be analyzed by the research team at UCSF and the findings will be presented only in aggregate. No personal or identifying information will be shared with payers or other parties, and a specified protocol will be followed to safeguard the information you provide. The UCSF research team may contact your office to confirm some of the information you supplied.

We would greatly appreciate your answering the following questionnaire and including your responses, along with your other license renewal information, in the envelope provided. Alternatively, if you are completing your renewal on line, you may submit your responses through the Web site. The study questions have been reviewed and approved by the MBC and UCSF's Committee on Human Research.

Janet Coffman, PhD, Associate Professor  
University of California, San Francisco  
(415) 476-2435

Natalie Lowe  
Medical Board of California  
(916) 263-2382

Please answer each question by completely shading the appropriate circle like this ●

**1. PRACTICE TYPE** *What is your principal practice location? (check only one)*

Solo practice	<input type="radio"/>	Kaiser Permanente	<input type="radio"/>
Small medical partnership (2 to 9 physicians)	<input type="radio"/>	Community health center/public clinic	<input type="radio"/>
Group practice (10 to 49 physicians)	<input type="radio"/>	VA or military	<input type="radio"/>
Large group practice including academia (50+ physicians)	<input type="radio"/>	Other (specify _____)	<input type="radio"/>

**2. TIME SPENT IN HOSPITAL SETTINGS** *Do you spend 90% or more of your time in hospital settings (inpatient or emergency department)?*

Yes  No

**3. PATIENT AGES** *What percentages of your patients are in the following age groups? (write in percentages, total should sum to 100%.)*

Age 0-17 Years                      Age 18-64 Years                      Age 65 Years or Older                      Total  
\_\_\_\_\_ +                      \_\_\_\_\_ +                      \_\_\_\_\_ =                      100%

**4. PAYERS** *Of your total number of patients, what percentage comes from each payer source? Please make the total approximately equal to 100% (For example, 50-59% private, 30-39% Medicare, and 10-19% Medi-Cal)*

	Private, commercial, other insurance	Medicare	Medi-Cal	Other (e.g., VA, CHAMPUS)	Uninsured
0%	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
1 to 9%	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10 to 19%	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20 to 29%	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30 to 39%	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
40 to 49%	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
50 to 59%	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
60 to 69%	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
70 to 79%	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
80 to 89%	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
90 to 99%	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
100%	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**5. ACO** *Is your practice part of an accountable care organization (ACO) - a group of physicians and hospitals that collaborate with one another and accept collective accountability for the cost and quality of care delivered to a population of patients)?*

Yes  No  Do Not Know

**6. NEW PATIENTS**

- a. Are you currently accepting new patients in your practice with private insurance?  
Yes  No
- b. Are you currently accepting new Medicare patients in your practice?  
Yes  No
- c. Are you currently accepting new fee-for-service Medi-Cal patients in your practice?  
Yes  No
- d. Are you currently accepting new Medi-Cal managed care (HMO) patients in your practice?  
Yes  No
- e. Are you currently accepting any new uninsured patients in your practice who are unable to pay?  
Yes  No
- f. Are you a cash only (no 3<sup>rd</sup> party insurance) practice?  
Yes  No

**7. MEDI-CAL PAYMENT RATES** What impact did an increase in Medi-Cal payment rates for primary care physicians in 2014 have on your willingness to care for Medi-Cal patients?

- a. Increased Medi-Cal participation
- b. No change in Medi-Cal participation
- c. Decreased Medi-Cal participation

**8. REASONS FOR LIMITING MEDI-CAL PATIENTS** How important is each factor below as a reason you do not accept or limit the number of Medi-Cal patients in your practice?

REASONS	Very important	Moderately important	A little bit important	Not important	Accept all Medi-Cal patients
a. Administrative hassle of Medi-Cal	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Delays in Medi-Cal payment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
c. Amount of Medi-Cal payment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
d. Medi-Cal patients have complex needs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
e. Medi-Cal patients are disruptive in the waiting room	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
f. Practice already has enough patients	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

**9. REFERRALS - PRIVATE INSURANCE** During the last 12 months, how often did you have **difficulty** obtaining the following services for your patients with **private insurance**?

PRIVATE INSURANCE	Hardly ever	Occasionally	Sometimes	Frequently	Almost always
a. Referrals to specialists	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Diagnostic imaging services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Referrals for outpatient mental health services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**10. REFERRALS- MEDI-CAL** During the last 12 months, how often did you have **difficulty** obtaining the following services for your patients on **Medi-Cal**?

MEDI-CAL	Hardly ever	Occasionally	Sometimes	Frequently	Almost always
a. Referrals to specialists	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Diagnostic imaging services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Referrals for outpatient mental health services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Appendix D. California Counties Included in Regions



### COUNTIES

<b>Central Coast</b>	Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz, Ventura
<b>Greater Bay Area</b>	Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma
<b>Inland Empire</b>	Riverside, San Bernardino
<b>Los Angeles County</b>	Los Angeles
<b>Northern and Sierra</b>	Alpine, Amador, Butte, Calaveras, Colusa, Del Norte, Glenn, Humboldt, Inyo, Lake, Lassen, Mariposa, Mendocino, Modoc, Mono, Nevada, Plumas, Shasta, Sierra, Siskiyou, Sutter, Tehama, Trinity, Tuolumne, Yuba
<b>Orange County</b>	Orange
<b>Sacramento Area</b>	El Dorado, Placer, Sacramento, Yolo
<b>San Diego Area</b>	Imperial, San Diego
<b>San Joaquin Valley</b>	Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, Tulare

## **Appendix E. Physician Race/Ethnicity Categories**

### **White**

White

European

### **African American**

African

African American

Black

### **Latino**

Central American

Cuban

Mexican

Puerto Rican

South American

Other Hispanic

### **Middle Eastern**

### **American Indian / Alaska Native**

American Indian

Native American

Alaska Native

### **Multiracial/Ethnic**

### **Other**



## Appendix F. Identifying and Categorizing Physician Specialty

### Family Medicine

Family Medicine  
General Practice

### General Internal Medicine

Internal Medicine  
Geriatrics

### Pediatrics

### Obstetrics and Gynecology

### Psychiatry

Psychiatry  
Psychosomatic Medicine

### General Surgery

### Facility-Based Specialties

Anesthesiology  
Emergency Medicine  
Pathology  
Radiology

### Other Specialties

Aerospace Medicine  
Complementary and Alternative Medicine  
Pain Medicine  
Public Health and General Preventive Medicine  
Other Specialty

### Medical Specialties

Allergy and Immunology  
Cardiology  
Critical Care  
Dermatology  
Endocrinology  
Epilepsy  
Gastroenterology  
Hematology  
Hospice and Palliative Medicine  
Infectious Disease  
Medical Genetics  
Neonatal-Perinatal Medicine  
Nephrology  
Neurology  
Occupational Medicine  
Oncology  
Pulmonology  
Rheumatology  
Sleep Medicine

### Surgical Specialties

Colon and Rectal Surgery  
Cosmetic Surgery  
Facial/Plastic/Reconstructive Surgery  
Neurological Surgery  
Ophthalmology  
Orthopedic Surgery  
Otolaryngology  
Pediatric Surgery  
Plastic Surgery  
Spine Surgery  
Sports Medicine  
Surgery of the Hand  
Surgical Critical Care  
Surgical Oncology  
Thoracic Surgery  
Urology  
Vascular Surgery

## Appendix G. Supply of Active Patient Care Physicians in 10 Major Categories of Specialties by Region, 2015

	Central Coast	Greater Bay Area	Inland Empire	Los Angeles County	Northern and Sierra	Orange County	Sacramento Area	San Diego Area	San Joaquin Valley	Unknown Region	California
<b>Primary Care</b>											
Family Medicine	591	1,439	652	1,768	381	697	471	674	728	35	<b>7,436</b>
General Internal Medicine	367	2,287	602	2,050	194	600	486	698	579	32	<b>7,895</b>
Pediatrics	203	1,179	295	1,078	85	352	265	362	331	16	<b>4,166</b>
<b>Specialty Care</b>											
Obstetrics and Gynecology	160	849	214	812	64	285	184	255	255	15	<b>3,093</b>
Psychiatry	232	1,231	275	1,027	77	221	213	368	239	18	<b>3,901</b>
General Surgery	79	345	135	380	68	113	100	123	142	6	<b>1,491</b>
Facility-Based Specialties	603	2,090	792	2,953	394	934	820	1,141	740	57	<b>11,343</b>
Medical Specialties	567	2,709	747	3,179	211	948	642	1,001	697	48	<b>10,749</b>
Surgical Specialty	384	1,835	504	2,118	193	693	460	757	431	40	<b>7,415</b>
Other Specialty	151	700	220	750	57	241	157	263	196	7	<b>2,742</b>
Unknown Specialty	45	206	82	304	35	77	57	66	91	2	<b>965</b>
<b>Physician Supply</b>											
Total MDs	3,382	15,689	4,518	16,419	1,759	5,161	3,855	5,708	4,429	276	<b>61,196</b>
Region Population (in millions)	2.3	7.7	4.5	10.2	1.4	3.2	2.3	3.5	4.2		<b>39.1</b>
Total MDs/100K	144.3	205.1	100.6	161.4	125.0	162.8	169.5	164.0	106.6		<b>156.3</b>
▶ Primary Care	49.5	64.1	34.5	51.3	46.9	52.0	53.7	49.8	39.4		<b>49.8</b>
▶ Specialist	92.9	138.2	64.3	110.3	75.6	108.4	113.3	112.3	65.0		<b>104.1</b>

Source: Analysis of Medical Board of California data by the Philip R. Lee Institute for Health Policy Studies, University of California, San Francisco.

## Endnotes

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