

## Physician Supply and Medical Education in California A Comparison With National Trends

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Concerns have been voiced about an impending oversupply of physicians in the United States. Do these concerns also apply to California, a state with many unique demographic characteristics? We examined trends in physician supply and medical education in California and the United States between 1980 and 1995 to better inform the formulation of workforce policies appropriate to the state's requirements for physicians. We found that similar to the United States, California has more than an ample supply of physicians in the aggregate, but too many specialists, too few underrepresented racial/ethnic minority physicians, and poor distribution of physicians across the state. However, recent growth in the supply of practicing physicians and resident physicians per capita in California has been much less dramatic than in the country overall. The state's unusually high rate of population growth has enabled California, unlike the United States as a whole, to absorb large increases in the number of practicing physicians and residents during 1980 to 1995 without substantially increasing the physician-to-population ratio. Due to a projected slowing of the state's rate of population growth, the supply of physicians per capita in the state will begin to rise steeply in coming years unless the state implements prompt reductions in the production of specialists. An immediate 25% reduction in specialist residency positions would be necessary to bring the state's supply of practicing specialists in line with projected physician requirements for the state by 2020. We conclude that major changes will be required if the state's residency programs and medical schools are to produce the number and mix of physicians the state requires. California's medical schools and residency programs will need to act in concert with federal and state government to develop effective policies to address the imbalance between physician supply and state requirements.

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Concerns about the supply and distribution of physicians in the United States have featured prominently in recent debates over health care reform. Most policy analysts and organizations addressing this topic have concluded that the nation has an abundant supply of physicians, but that this supply is poorly distributed geographically, contains too many specialist physicians, and is too unrepresentative of the nation's racial and ethnic diversity.<sup>1–5</sup>

Physician supply in the United States has grown rapidly over the past few decades, with the number of physicians per capita increasing by more than 50% between 1970 and 1990.<sup>5</sup> The surge in physician supply has been triggered by the expansion of medical schools

and residency programs in the United States. A growing proportion of the residency positions added in recent years has been filled by physicians who graduated from medical schools outside the United States (referred to as “international medical graduates” [IMGs]).<sup>6</sup> Critics have argued that this excessive growth in physician supply fuels accelerating health care costs and represents an imprudent investment of public dollars in the form of growing tax subsidies for medical education.<sup>7</sup> Compounding these concerns have been new apprehensions that the managed care firms coming to dominate the US health insurance market have leaner staffing patterns than the traditional fee-for-service system, creating

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**ABBREVIATIONS USED IN TEXT**

ACGME = Accreditation Council for Graduate Medical Education  
 AMA = American Medical Association  
 COGME = Council on Graduate Medical Education  
 GME = Graduate Medical Education  
 GMENAC = Graduate Medical Education National Advisory Committee  
 HMO = health maintenance organization  
 IMG = international medical graduate  
 LCME = Liaison Committee on Medical Education

the specter of physician unemployment—particularly for specialists.<sup>8</sup>

Much of physician workforce analysis and policy-making in the United States has been viewed from a national perspective. Although this national perspective is important, information about state and local trends is equally valuable to educational institutions, health care facilities, state and local governments, and other entities making decisions about medical education. California, the most populous state in the nation, is unique in many ways. It has one of the highest degrees of managed care market penetration of any state.<sup>9</sup> California also has several distinguishing demographic trends. California's rate of population growth has been more than twice the rate of the nation as a whole, and the state has a more diverse and rapidly changing racial and ethnic composition that will soon result in fewer than half of the state's residents being of white, non-Latino background.

In this context, it is important to know how California's unique demographic characteristics might create special conditions for developing workforce policies appropriate for the state's needs and how the California physician workforce compares with national trends. In this article, we assess the current status of physician supply in California and compare it with the United States as a whole. We also project physician supply in the state to 2020 under different scenarios of growth in physician supply. We discuss the implications for workforce policy of the current and projected supply of physicians in California.

### Policy Background

Both the federal government and the California state legislature have formulated physician workforce policies. Several federal advisory bodies, including the Council on Graduate Medical Education (COGME) and the Physician Payment Review Commission, have recommended greater federal regulation of graduate medical education (GME) and downsizing of specialist residency programs.<sup>2,10</sup> Although Congress rejected legislative proposals of such a sweeping scope, the federal government has demonstrated continued interest in more modest reforms using the policy lever of Medicare funding for GME. Medicare is the largest single government source

of funding for GME, contributing more than \$7 billion annually.<sup>11</sup> In 1997, Congress adopted a policy that would allow programs to voluntarily reduce residency positions while allowing a more gradual phasing out of Medicare GME funding for these unfilled residency slots.

The most noteworthy recent legislative activity at the state level in California concerns regulation of GME in the University of California (UC). In the early 1990s, the legislature twice passed, and Governor Wilson twice vetoed, bills authored by former Assemblyman Phillip Isenberg that would have required the UC to allocate 50% of its residency positions to primary care disciplines or face a reduction in state funding. In lieu of this proposed legislative mandate, Governor Wilson and UC agreed to a voluntary plan to increase primary care positions and reduce specialist positions within the UC system.

### Methods

#### *Data Sources*

Published references and active databases maintained by the American Medical Association (AMA) were the major sources of data used in our analysis. Detailed data on physicians currently practicing in California were extracted electronically from 1995 AMA Physician Masterfile records. Published Masterfile tabulations were used to measure overall trends in physician supply.<sup>12</sup> The Masterfile contains regularly updated records for every physician who enters a medical school accredited by the Liaison Committee on Medical Education (LCME) or a residency program in the United States accredited by the Accreditation Council for Graduate Medical Education (ACGME), regardless of whether the physician is an AMA member. Many osteopathic physicians are included, as many graduates of osteopathic medical schools complete ACGME-accredited residency programs. The AMA was also the major source of information on residency programs and residents. The Medical Education Database is updated annually by the AMA through a survey of directors of ACGME-accredited residency programs.<sup>13</sup>

In addition to analyzing the state's overall supply of physicians, we examined physician supply at a more regional level, dividing the state into 10 regions that largely correspond to the Health Service Areas as defined by the California Office of Statewide Health Planning and Development. These regions consist of either large single counties (such as Los Angeles) or aggregates of smaller contiguous counties (such as the San Francisco Bay Area) (Table 1).

We modeled the future growth of physician supply in California for the period 1995–2020 using a computerized state forecasting model previously developed for a study of physician supply in New York.<sup>14</sup> The model begins with the 1995 supply of physicians in California divided into strata based on increments of 5 years in physician age and then projects successive five-year changes in supply for each age strata based on historical

TABLE 1.—California counties grouped by region.

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

patterns of physician additions and physician attrition due to death and retirement. The model also assumes that historical patterns will continue in terms of the number of residency graduates leaving California and the number of physicians entering California after completing residency training in another state.<sup>15</sup> We separately modeled growth in the supply of specialists and generalists and computed projections under three different scenarios: continued growth in the number of residency graduates based on the average annual growth for 1980–1995 (“historical growth” scenario); a cap on the output of residency graduates at the 1995 level (“capped-growth” scenario); and for specialists only, an assumption of an immediate 25% reduction in the annual output of residency graduates. Projections of overall state population growth for 1995–2020 were drawn from the most recent estimates from the US Bureau of the Census.<sup>16</sup>

### Supply Requirements

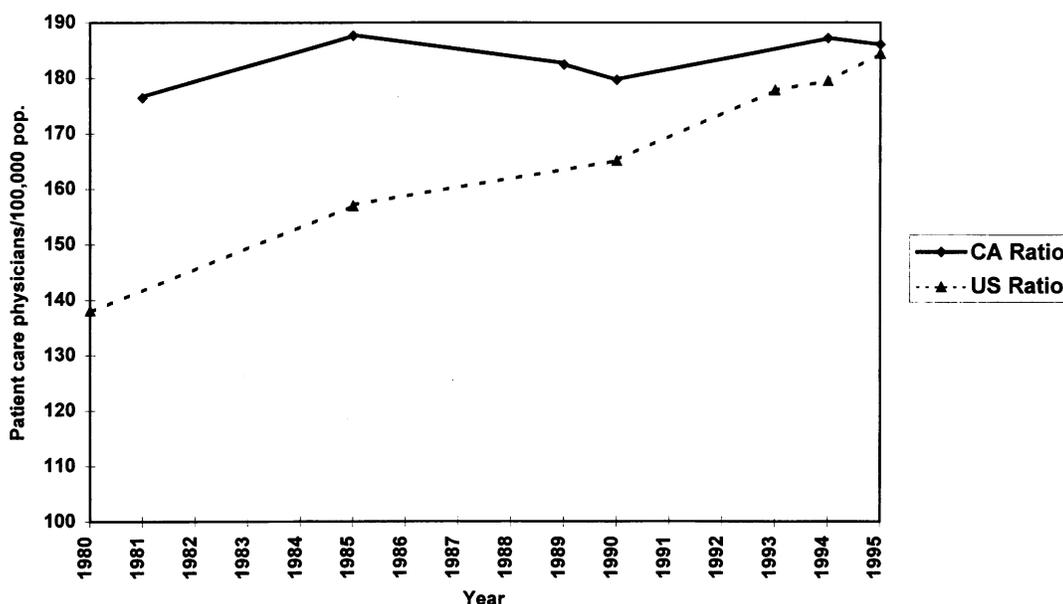
To analyze physician supply requirements, we relied primarily on “requirements bands” developed by COGME.<sup>17,18</sup> These requirement estimates pool the results of three different models: needs-based, historical demand-based, and health maintenance organization (HMO) demand-based. Needs-based models derive physician supply requirements from information about the epidemiology of disease and illness in a population. COGME incorporated the most well-known needs-based model, which was developed by the Graduate Medical Education National Advisory Committee (GMENAC) in 1980. In contrast, the two types of demand-based models start from the premise that physician supply requirements should be based on patterns of physician utilization rather than patterns of disease and illness. Traditional demand-based models rely on historical time series data on trends in demographics, health insurance status, and other factors that affect demand for physician services. The rapid pace of change in health care during the 1990s has called into question the appropriateness of the historical approach, leading physician workforce analysts to devise new models based on HMO staffing patterns. These models use HMO staffing levels as a benchmark for setting physician supply requirements, adjusting these staffing levels for factors that may differ among HMO enrollees and the population at large (for example, out-of-plan utilization and the younger age distribution of HMO enrollees).<sup>8</sup> COGME developed physician supply requirements for generalist and specialist physicians that reflect the range of supply requirements estimated by several of these analytic models. These requirements estimates are sensitive to the assumptions used in the models,<sup>19</sup> and there is no universally accepted standard for defining the adequacy of physician supply. However, the COGME requirements estimates have proved useful as a benchmark for evaluating physician supply.

## Results

### Supply of Practicing Physicians

Between 1980 and 1995, the supply of active patient care physicians (excluding residents and physicians primarily active in teaching, research, or administration) in the United States rose from 138 to 184 per 100,000 population and is projected to increase to 203 per 100,000 by the year 2000.<sup>5</sup> COGME estimates that the United States requires 145 to 185 patient care physicians per 100,000 population (60 to 80 generalists and 85 to 105 specialists per 100,000 population).<sup>17</sup> (Generalists include physicians in family practice, general practice, general internal medicine, and general pediatrics.) By this measure, the United States already is at the upper bound of the requirements range for total physicians and would have an oversupply of 10% to 40% by 2000.

California’s current level of physician supply is similar to that of the United States as a whole. In 1995,



**Figure 1.**—Nonfederal physicians active in patient care (excluding residents) per 100,000 population in California (solid line) and the United States (broken line), 1980 to 1995.

California had 186 active patient care physicians per 100,000 population, compared with 184 per 100,000 for the US. In contrast with the pattern for the country as a whole, however, California has not had a major surge in the physician to population ratio over the past 15 years (Figure 1). In 1980, California had a physician supply of 172 per 100,000 population, well above the overall US supply of 138 per 100,000. Since that time, physician supply in the nation has virtually caught up to the California level, which has remained relatively constant.

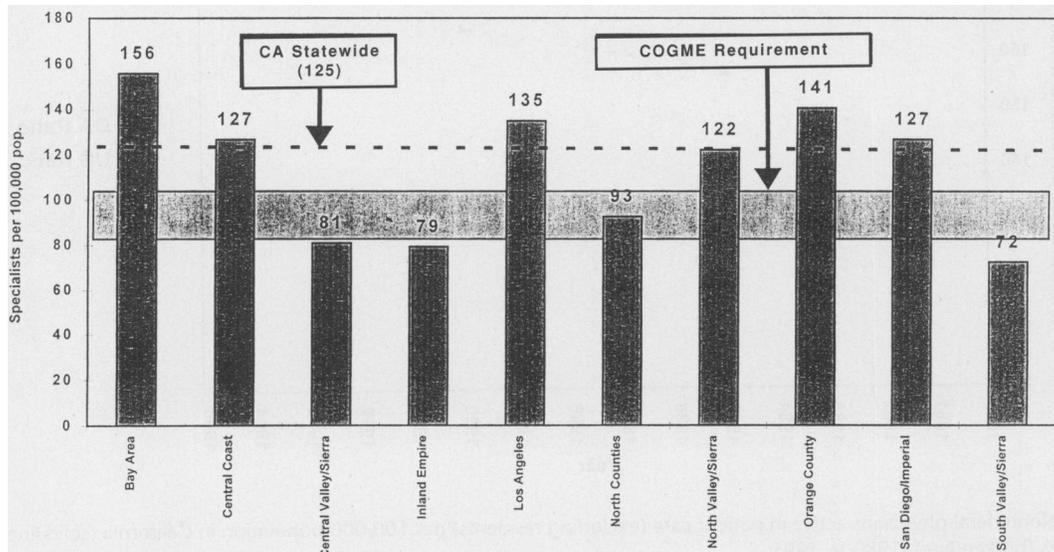
This convergence of physician supply between California and the rest of the country is not principally explained by California workforce policies aimed at more vigorously restricting growth in the number of physicians trained and entering practice in the state. On

the contrary, the absolute number of physicians practicing in California grew by 46% from 1980 to 1995, comparable to the 54% rate of increase for the United States as a whole (Table 2). However, California has been able to absorb this large increase in the number of physicians without a major increase in the supply of physicians per capita because of the dramatic growth in the state's population between 1980 and 1995. The California population grew twice as fast as the nation's population in this period (Table 2). Thus, the high rate of population growth in California has masked the large increase in the number of physicians in California, resulting in a stable ratio of patient care physicians-to-population from 1980 to 1995 that stands in marked contrast to the trend for the US as a whole.

TABLE 2.—Supply of Practicing Physicians, Physicians in Residency Training, and Medical students in California and the United States, 1980 and 1995

	California			United States		
	1980	1995	% change	1980	1995	% change
<b>Practicing Physicians</b>						
Absolute Number	40,772	59,377	46%	314,470	485,779	54%
Number per 100,000 pop	172	186	8%	138	184	33%
<b>Residents</b>						
Absolute Number	6,120	8,678	42%	61,819	98,035	59%
Number per 100,000 pop	26	27	4%	27	37	37%
<b>Medical Students</b>						
Absolute Number	4,189	4,366	4%	65,497	66,906	2%
Number per 100,000 pop	18	13	-28%	29	26	-10%
Total Population	.23 million	32 million	39%	227 million	263 million	16%

### California Specialist Physicians Active in Patient Care (Excluding Residents) per 100,000 Population by Region, 1994



**Figure 2.**—California specialist physicians active in patient care (excluding residents) per 100,000 population by region, 1995. Horizontal bar represents Council on Graduate Medical Education (COGME) range of estimated requirement for specialist physicians (85 to 105 per 100,000 population).

#### Specialty Distribution

Workforce policies are concerned not only with the total number of physicians, but also with the supply of physicians in different specialties. Based on COGME estimates of physician requirements by specialty, the United States has too many specialist physicians and a barely adequate supply of generalists. In 1992, the nation had 123 specialists in patient care practice (excluding residents) per 100,000 population, with COGME estimating a requirement for only 85 to 105 per 100,000. In contrast, the supply of generalists (67 per 100,000 population) was within the COGME requirement band of 60 to 80 per 100,000. COGME projections suggest that through 2020, the nation's supply of generalists will remain adequate and the oversupply of specialists will continue to grow, unless the number of physicians trained as specialists is decreased.<sup>17</sup>

Similar patterns are evident in California. For the state as a whole, two thirds of practicing physicians are specialists. The state's overall supply of specialists (126 per 100,000 population) is well above COGME's estimate of requirement for specialists. At the regional level, six areas in California have a supply of specialists that exceeds the upper range of the requirement estimate, while three regions have inadequate supplies of specialists (Figure 2). The Bay Area has the highest concentration of specialists, with an excess supply of 50% to 84%. Large metropolitan areas are more likely to have an oversupply than are rural agricultural and mountain areas.

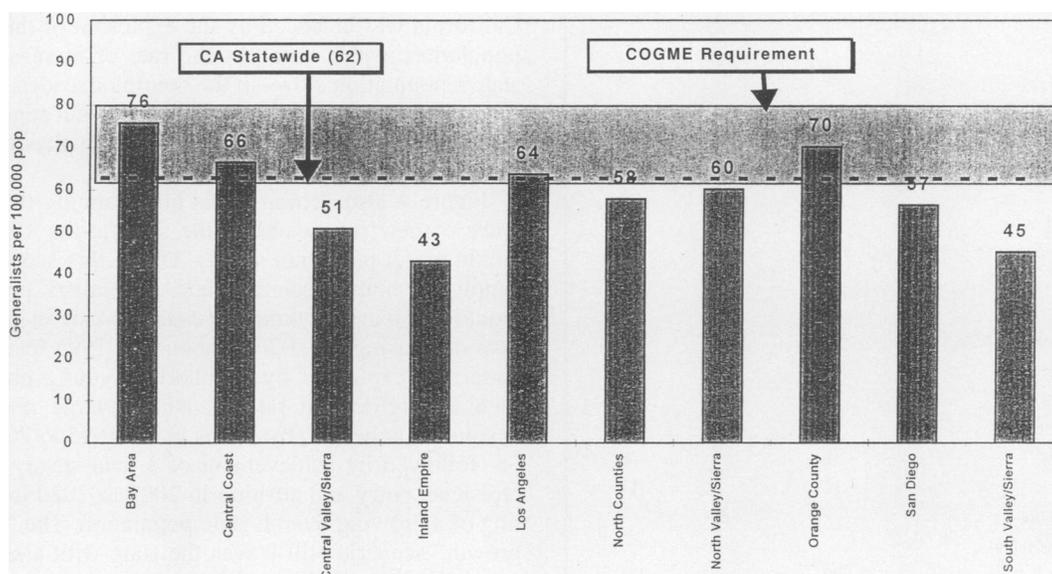
In contrast, California overall has a barely adequate supply of generalists, with many regions within the state falling short of the minimum requirement estimate (Figure 3). Six regions in California have shortages of generalist physicians and the four remaining regions have adequate supplies of generalists. No region has an oversupply of generalists.

#### Geographic Distribution

Despite the dramatic increase in the number of physicians in the nation in the past 30 years, many rural areas and inner cities remain underserved. Paradoxically, there are now more communities with physician shortages than there were in the 1960s. Since 1990, the ratio of generalist physicians to population has decreased in rural counties with fewer than 50,000 inhabitants.<sup>5</sup>

The geographic distribution of physicians in California mirrors that of the nation. Most regions encompassing major metropolitan areas in California have oversupplies of physicians overall, whereas some largely agricultural regions have shortages. Even in major metropolitan areas, pockets of underservice persist. The federal government has designated that 124 inner-city and rural areas across the state have shortages of generalist physicians.<sup>20</sup> Since 1980, there has been little change in relative supplies of physicians across California's regions. Regions with an undersupply of physicians in 1980 remained undersupplied in 1994.

### California Generalist Physicians Active in Patient Care (Excluding Residents) per 100,000 Population by Region 1994



**Figure 3.**—California generalist physicians active in patient care (excluding residents) per 100,000 population by region, 1995. Horizontal bar represents Council on Graduate Medical Education (COGME) range of estimate requirement for generalist physicians (60–80 per 100,000 population).

#### Supply of Residents

The number of residents training in the United States has grown dramatically since the early 1980s. Between 1980 and 1995, the number of residents in the United States increased by 59%, from approximately 62,000 to 98,000 residents.<sup>13</sup>

The number of residents educated in California has grown, but not as dramatically as the number in the nation as a whole (42% versus 55% between 1980 and 1995) (Table 2). The state's high rate of population growth kept pace with the increase in the number of practicing physicians, as well as with the number of practicing physicians. Thus, whereas the ratio of residents to population in the United States rose by 37% between 1980 and 1995, it remained relatively stable in California.

Almost three quarters of resident physicians trained in California remain in the state to practice; however, California training programs are not the only source of new physicians for the state. Over a third of practicing physicians in California trained in residency programs in other states.<sup>15</sup> The large expansion of training programs in other states, therefore, affects physician supply in California, partially mitigating the effect of the slower growth of training programs within the state.

Although 41% of physicians graduating from residency programs in 1994–1995 completed training in generalist fields (Table 3), this figure overstates the proportion actually entering practice as generalists. Nationwide, only approximately 40% of graduates of

internal medicine and 60% of graduates of pediatric residencies enter practice as generalists. The remainder of these physicians enter subspecialty training programs.<sup>21</sup> In contrast, more than 90% of family practice residency program graduates remain in family practice.<sup>22</sup> Thus, only approximately a third of California residents pursue generalist careers, a figure similar to the percentage of physicians currently in practice in California in generalist fields (33%).

Most of the recent growth in the number of residents educated in the United States is attributable to an increase in the number of IMG residents. Between 1990–1991 and 1993–1994, the number of IMG residents in the United States rose by 48%, from approximately 16,000 to 23,700.<sup>5</sup> California has a much smaller percentage of IMG residents than the nation as a whole. In 1995–1996, IMGs constituted 23% of resident physicians in the United States but only 12% of resident physicians in California.

Another important difference between California and the nation as a whole is the distribution of IMG residents by citizenship and visa status. Some IMG residents are US citizens and permanent residents whereas others hold temporary visas for purposes of completing medical education in the United States. Whereas IMGs on temporary visas account for nearly half of residents nationwide in 1995–1996, only 23% of IMG residents in California held temporary visas. Because California has a smaller percentage of IMGs to begin with, the per-

TABLE 3.—Characteristics of Practicing Physicians and Physicians in Residency Training in California (1994)

	Practicing Physicians	Residents
Sex (%)		
Women	20	36
Race-Ethnicity (%)		
White	73	55
African-American	3	5
Latino	4	5
Asian and other	20	35
Specialty (%)		
Generalist	33	41*
Ob-Gyn	4	5
Facility-based	12	12
Gen Surgery	11	6
Med Subspec	7	11
Surg Subspec	14	8
Psychiatry	8	6
Other	11	11
Medical School of Graduation (%)		
US	80	88
Calif	24	34
Other-US and Canada	56	54
Non US (IMG)	20	12

\*Specialty data for residents include only residents in final year of residency program.

centage of total residents who are IMGs on temporary visas is small, only 3%.

### Projecting Supply to 2020

We projected the growth in physician supply in California from 1995 to 2020 using different assumptions about the number of physicians entering practice in the state. We analyzed these trends separately for specialists and generalists.

A continuation of trends in growth in the number of new physician entrants in California during the period from 1980 to 1995 would lead to an upsurge in physician supply rather than perpetuating the relatively stable pattern of physician-to-population supply that existed in 1980 to 1995. As indicated by the top line in Figure 4, under this "historical growth" scenario, the supply of specialists would rise from 126 per 100,000 in 1995 to 161 per 100,000 in 2020. The 2020 supply would thus be even further out of alignment with the estimated requirement for specialists, compared with supply in 1995. The supply of generalists would also rise, from 62 per 100,000 in 1995 to 80 per 100,000 in 2020, reaching the upper range of the generalist supply requirement.

The reason that the historical growth scenario would produce an increase in the supply of physicians per capita, rather than sustaining the stable pattern of physician supply per capita observed in 1980 to 1995, is because

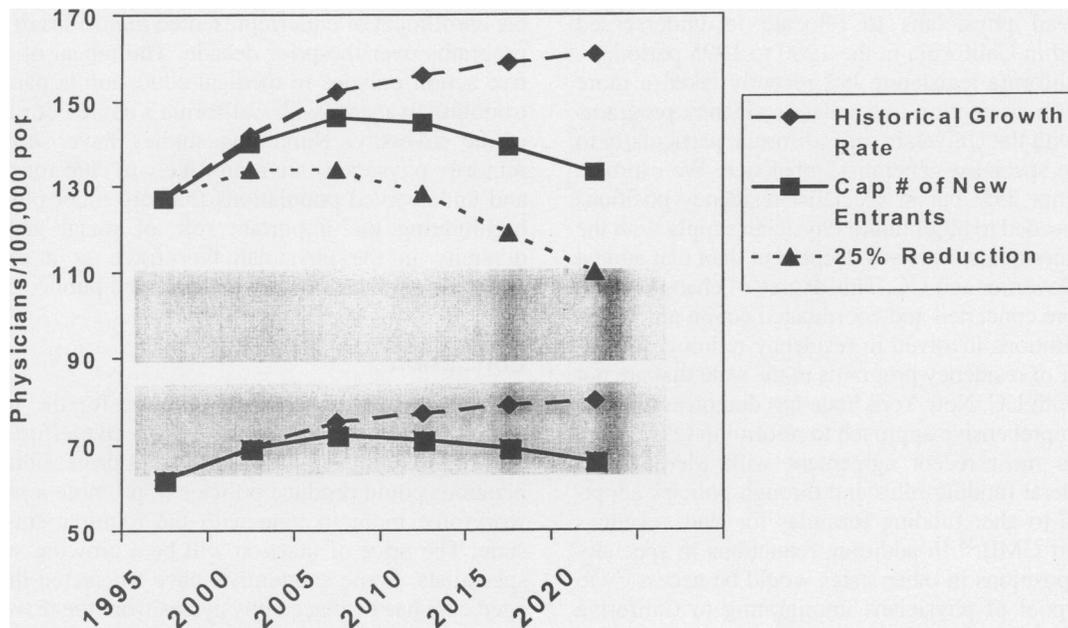
California's population growth is expected to slow in the 1995 to 2020 period (although it will remain higher than the rate of growth in the US population).<sup>16</sup> The major growth in the output of physicians in 1980 to 1995 in California was balanced by the explosion of the overall population in the state. As the rate of increase of the state's population slows in the coming decades, a corresponding change in the growth of physician supply must occur to avoid disproportionate growth in physician supply relative to population.

Figure 4 also demonstrates how capping the annual entry of new physicians in the state at the 1995 level would affect physician supply. Under this scenario, the supply of both specialists and generalists per capita would climb in the coming decade, peaking in 2005, and then decreasing by 2020 to about the 1995 levels. This pattern is explained by a cohort of young physicians with low retirement rates causing a large rise in the absolute number of physicians in the 1995 to 2005 period, followed by achievement of a near-steady state of physician entry and attrition in 2005 to 2020 in the setting of a growing overall state population. The "capped-growth" scenario still leaves the state with a supply of specialists exceeding the estimated requirements throughout the 1995 to 2020 period.

We also projected the outcome of an immediate 25% reduction in the entry of new specialists in California, with entry continuing at this lower level through 2020. Under this scenario, the supply of specialists in California would decline to eventually reach the upper range of the requirement estimate in 2020. After 2020, specialist supply would continue to fall unless residency output grew slightly at that time to match the ongoing growth of the state's population.

### Women and Minorities

The data presented above have focused on trends in the overall supply of physicians and have highlighted differences between generalists and specialists. However, a balanced physician supply requires not only the proper mix of generalists and specialists, but also consideration of the balance among male and female physicians and among physicians of varying race and ethnicity. Historically, women and racial/ethnic minorities have been underrepresented in medicine. The gender distribution of the physician workforce in California now appears to be approaching parity with that of the state's population. Although only 20% of practicing physicians in California are women, 36% of residents and 43% of first-year medical students in the state are women (Table 3).<sup>23</sup> As physicians currently in residency training and medical school eventually enter practice, they will steadily shift the overall pool of practicing physicians toward a 50:50 distribution of men and women. However, in California, women are disproportionately represented among primary care-oriented residency programs. Female residents comprise 64% of the positions in obstetrics-gynecology programs and nearly half of those in generalist programs, whereas men continue to pre-



**Figure 4.**—Projected supply of generalist and specialist physicians in California, 1995 to 2020. The upper series of lines shows the projected supply of specialists under assumptions of historical growth rate, capped rate of new entrants, and 25% reduction in new entrants. Lower series of lines shows the projected supply of generalists under assumptions of historical growth rate and capped rate of new entrants. Shaded horizontal bars indicate range of estimated requirements for specialists (upper bar) and generalists (lower bar) (from the AMA Masterfile and US Bureau of the Census, CPS Report, PPL-47).

dominate in surgical programs (female enrollment is 14% in surgical subspecialties and 21% in general surgery). This pattern is consistent with national trends.

Less progress has been made in achieving a physician workforce in the state that reflects the racial and ethnic diversity of the California population. California is one of the most racially and ethnically diverse states in the United States, with non-Latino whites constituting only 57% of the state's population. African Americans account for 7% of California's population but only 3% of practicing physicians. This disparity is even more pronounced for Latinos, who comprise 26% of the state's population but only 4% of physicians (Table 3).

Physicians training in residency programs in the state are only slightly more representative of the state's overall racial and ethnic composition. Greater progress has been made at the level of medical school education; during 1990 to 1994, 14% of California medical students were from underrepresented minority groups.<sup>24</sup> However, recent trends are particularly inauspicious. From 1996 to 1997, enrollment of underrepresented minorities among entering students decreased by 22% in UC medical schools and by 16% in private medical school.<sup>25</sup> During the 1997–1998 academic year, two UC medical schools enrolled no new African American students.

## Discussion

The rapid growth of California's population in recent years has created a more stable supply of physicians per

capita in the state compared with the dramatic increase in physician supply in the United States as a whole. However, the relative stability of physician supply in California will almost certainly abruptly change into a rapid increase if the rate of population growth in the state diminishes as anticipated in the coming years. As California shifts into a period of slower overall population growth, policies will be needed to more actively manage the production of new physicians in the state to avert a more critical problem of oversupply.

The current physician workforce in California is already out of balance in several ways. Similar to the nation as a whole, California has an excess of specialists and a barely adequate supply of generalists. The oversupply of specialists may be adversely affecting employment opportunities for newly trained specialists. Graduates in the Pacific region were reported to experience greater difficulty finding employment than graduates in other areas of the United States. One in five residents completing residency programs in the Pacific states in 1994 in medical and surgical subspecialties, and one in four of residents completing training in hospital-based specialties reported difficulty securing a full-time practice position.<sup>26</sup>

Physicians are poorly distributed across geographic regions of the state, with physicians concentrated in more affluent urban and suburban communities. Prior research has shown that family physicians are more likely than other primary care physicians to locate their practices in underserved areas of California.<sup>27</sup> Increased competition among physicians in oversupplied regions

did not lead physicians to relocate to underserved regions within California in the 1980 to 1995 period.

The California legislature has recently taken a more active role in attempting to regulate residency programs affiliated with the University of California, particularly to address the specialist-generalist imbalance. We estimate that a prompt 25% cut in specialist residency positions would be needed to align future physician supply with the state's requirements. This is a deeper cut than that agreed to by the Governor and UC. This degree of change would require more concerted and coordinated action among all of the institutions involved in residency training, including the half of residency programs in the state that are not affiliated with UC. New York State has demonstrated this type of comprehensive approach to reforming GME, both through its most recent agreement with Medicare to change federal funding rules and through policies adopted in 1996 to alter funding formulas for state revenues that support GME.<sup>28</sup> In addition, reductions in specialty residency positions in other states would be necessary to affect the pool of physicians immigrating to California after completing training in other states.

Many federal proposals to downsize residency positions have either explicitly or implicitly targeted these reductions to positions currently filled by IMGs. For example, some recent proposals have called for eliminating Medicare GME funding for positions held by IMGs. Other proposals have aimed to reduce first-year residency positions to a number equal to 110% of US medical graduates<sup>1,10</sup>; currently, there are 40% more first-year positions than the number of US medical school graduates. Although the US overall could absorb a 25% to 30% reduction in residency positions without imperiling GME opportunities for US medical school graduates, only 12% of residency positions in California are filled by IMGs. Moreover, most IMGs in California are US citizens or permanent residents and may have legal protections against discriminatory GME reforms.<sup>29</sup> The magnitude of the reduction of residency positions we propose for California would therefore eliminate some residency positions in the state currently held by US medical school graduates. On the other hand, the number of first-year GME positions offered would remain far greater than the number of students graduating from medical schools in California, assuring reasonable opportunities for California graduates to pursue residency training in the state.

The workforce in California is headed toward a more equal composition of men and women physicians. However, the racial and ethnic composition of the physician workforce is highly unrepresentative of the state's overall population. Achieving a more racially and ethnically diverse physician supply is an area in which recent gains appear threatened by new policies in California. In 1995, the UC Board of Regents voted to eliminate affirmative action in admissions. In November 1996, the California electorate enacted a measure prohibiting affirmative action policies among state agencies. These events appear to have already reversed the gains made in

the enrollment of underrepresented minorities in training programs over the prior decade. The repeal of affirmative action policies in medical education is particularly troubling in a state with California's degree of racial and ethnic diversity. Numerous studies have shown that minority physicians are more likely to care for minority and underserved populations than are other physicians, highlighting the important role of racial and ethnic diversity in the physician workforce as a means of addressing the health care needs of the public.<sup>30,31</sup>

## Conclusion

California is at a critical juncture for the future of workforce policies in the state. Cohesive efforts on the part of government, educational, and professional organizations could produce policies to promote a physician workforce more in tune with the requirements of the state. The price of inaction will be a growing surfeit of specialists. Some economists have suggested that managed care has displaced physicians from the driver's seat in terms of health care costs. Although strategies such as selective physician contracting and utilization management may dampen the degree to which physician oversupply accelerates health care expenditures in the future, an overabundance of physicians and an imbalanced specialty distribution are likely to continue to exert inflationary pressures on the health care system without improving access to care. Moreover, a tremendous amount of human capital and public resources will be squandered in training young physicians for specialties in which they may not find gainful employment and productive practice. Without a significant change of direction, institutions of medical education in California may be abdicating their responsibility both to society and to the individuals they train.

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