



THE PRACTICE OF
MEDICINE IN CALIFORNIA:
A Profile of the Physician Workforce

FEBRUARY 2001

Catherine Dower, JD
Tina McRee, MA
Kevin Grumbach, MD
Bram Briggance, MA
Sunita Mutha MD
Janet Coffman MPP
Karen Vranizan, MA
Andrew Bindman, MD
Edward H. O'Neil, PhD



THE CENTER
FOR THE HEALTH PROFESSIONS
University of California, San Francisco

© 2001 Center for the Health Professions, University of California, San Francisco.
All materials subject to this copyright may be photocopied for the non-commercial purpose of scientific or educational advancement.

Suggested citation style: Dower C, McRee T, Grumbach K, Briggance B, Mutha S, Coffman J, Vranizan K, Bindman A, O'Neil E. *The Practice of Medicine in California: A Profile of the Physician Workforce*. San Francisco CA: California Workforce Initiative at the UCSF Center for the Health Professions. February 2001.

Acknowledgments

This report was made possible through the support of the California HealthCare Foundation, which, in partnership with The California Endowment, funds the California Workforce Initiative.

Additional support for research activities contributing to this report came from the Bureau of Health Professions, Health Resource and Service Administration; the Agency for Health Care Policy and Research (R03 HS09557-01); and the California Program on Access to Care, California Policy and Research Center.

The findings contained in this report do not necessarily reflect the views of the California HealthCare Foundation, The California Endowment or any other partial funders of the project.

California Workforce Initiative

The California Workforce Initiative, housed at the UCSF Center for the Health Professions and funded by the California HealthCare Foundation and The California Endowment, is designed to explore, promote and advance reform within the California health care workforce. This multi-year initiative targets supply and distribution, diversity, skill base and regulation of health workers, utilization of health care workforce and health care workers in transition.



The Center for the Health Professions

The mission of the Center for the Health Professions is to assist health care professionals, health professions schools, care delivery organizations and public policy makers respond to the challenges of educating and managing a health care workforce capable of improving the health and well being of people and their communities.

The Center is committed to the idea that the nation's health will be improved if the public is better informed about the work of health professionals.



The California HealthCare Foundation

The California HealthCare Foundation is an Oakland-based, independent non-profit philanthropic organization whose mission is to expand access for underserved individuals and communities, and to promote fundamental improvements in health status of the people of California.



The California Endowment

The California Endowment, the state's largest health foundation, was established to expand access to affordable, quality health care for underserved individuals and communities. The Endowment provides grants to organizations and institutions that directly benefit the health and well-being of the people of California.



* TABLE of FIGURES

<i>Figure 1.</i> Major Professional Activity of CA Active Physicians, 2000	5
<i>Figure 2.</i> Major Professional Activity of Active, Patient-Care Physicians in CA, 2000	6
<i>Figure 3.</i> Ratio of CA Active Patient-Care Physicians to 100,000 Population, 1994-2000	7
<i>Figure 4.</i> CA Patient-Care Physicians: Generalists and Specialists, 2000	8
<i>Figure 5.</i> CA Generalists and Specialists per 100,000 population, 1994-2000	9
<i>Figure 6.</i> CA Active Patient-Care Physicians by Specialty Category, 2000	10
<i>Figure 7.</i> Distribution of CA Active Patient-Care Physicians by Specialty Category, 2000	10
<i>Figure 8.</i> Supply of Total Patient-Care Physicians per 100,000 Population by Region, 2000	12
<i>Figure 9.</i> Supply of Patient-Care Specialist Physicians per 100,000 Population by Region, 2000	13
<i>Figure 10.</i> Supply of Patient-Care Generalist Physicians per 100,000 Population by Region, 2000	14
<i>Figure 11.</i> Active CA Patient-Care Generalist Physicians per 100,000 Population by Region, 1994, 2000	15
<i>Figure 12.</i> Active CA Patient-Care Specialist Physicians per 100,000 Population by Region, 1994, 2000	15
<i>Figure 13.</i> CA Active Patient-Care Physicians by Sex, 2000	17
<i>Figure 14.</i> CA Physicians in Residency Training by Sex, 1998	17
<i>Figure 15.</i> Physicians in CA Residency Training Programs by Race/Ethnicity and Sex, 1998	18
<i>Figure 16.</i> CA Medical School Matriculants by Sex, 2000-2001	18
<i>Figure 17.</i> Female Matriculants to CA and U.S. Medical Schools, 1970-2000	19
<i>Figure 18.</i> Percent of Active, Patient-Care Female Physicians by Specialty Category, CA 2000	19
<i>Figure 19.</i> CA Physicians and Population by Race/Ethnicity, 2000	21
<i>Figure 20.</i> CA Active Patient-Care Physicians by Specialty and Race/Ethnicity, 2000	23
<i>Figure 21.</i> CA Physicians in Residency Training by Race/Ethnicity, 1998	24
<i>Figure 22.</i> Underrepresented Minority Matriculants at CA Medical Schools, 2000	24
<i>Figure 23.</i> U.S. Medical School Matriculants by Race/Ethnicity, 1975-2000	25
<i>Figure 24.</i> CA Active Patient-Care Physicians by Age, 2000	25
<i>Figure 25.</i> Medical Schools Attended by CA Active Patient-Care Physicians, 2000	26
<i>Figure 26.</i> Residency Sites of CA Active Patient-Care Physicians, 2000	26
<i>Figure 27.</i> Main Practice Setting, CA Generalists, 1998	28
<i>Figure 28.</i> Main Practice Setting, CA Specialists, 1998	28
<i>Figure 29.</i> Size of Main Practice Setting for CA Physicians, 1998	31
<i>Figure 30.</i> CA Specialist and Generalist Participation in IPAs, 1998	31
<i>Figure 31.</i> Percent of Patients in HMOs: Generalists and Specialists, CA 1998	32
<i>Figure 32.</i> Income Structure of Generalist and Specialist Physicians, 1998	33
<i>Figure 33.</i> Generalists and Specialists Income Ranges, CA 1998	34
<i>Figure 34.</i> Satisfaction with Being a Physician, CA Generalists and Specialists, 1998	36
<i>Figure 35.</i> Physician Pressures on Care, California 1998	37-38
<i>Figure 36.</i> Perceived Autonomy Among Young Physicians in 1991 and 1996	39
<i>Figure 37.</i> Percent of Patients with Medi-Cal Insurance: California Generalists and Specialists, 1998	41
<i>Figure 38.</i> Percent of Patients Uninsured: California Generalists and Specialists, 1998	41

* TABLE *of* CONTENTS

Executive Summary	i
Introduction	1
SECTION ONE:	
California's Physician Workforce: Characteristics and Trends	
Aggregate Supply	5
Specialty Distribution	7
Geographic Distribution	11
Demographic Characteristics	17
Location of Medical Education and Training	25
SECTION TWO:	
The State of Medical Practice in California	
The Organization of Medical Practice	28
HMO Contracts	32
Physician Payment and Earnings	32
Physicians' Perception of Medical Practice in California	35
Caring for Underserved Californians	41
Conclusion	43
APPENDICES:	
A. Primary Data Sources and Methods	45
B. Physician Specialties by Category	49
C. California Active Patient-Care Physicians by Specialty and Race/Ethnicity	51
D. Grouping California Counties by Region	52
E. California Active Patient-Care Physicians and Ratios to Population, by Region	53
F. California Active Patient-Care Physicians and Ratios to Population, by County	54
References	56

* EXECUTIVE SUMMARY

This report provides a profile of the physician workforce in California in the year 2000. The first section includes most recent data (primarily from the American Medical Association (AMA) Masterfile) about aggregate supply (compared to requirements estimates), specialty and geographic distribution, demographic characteristics by sex, race and ethnicity, and age, and medical education and training enrollment. The second part of the report focuses on the state of medical practice in California. This section includes references to published literature and to previously unpublished data collected on California physicians. With this information, we present facts and figures and also provide some analysis of practice setting, physician organization, managed care involvement, Medi-Cal participation, financial incentives, earnings and physicians' experience of the practice climate in California.

Highlights of the report include the following:

Aggregate supply

- In 2000, California had almost 90,000 active allopathic and osteopathic physicians. Many of these physicians were still in residency training or working outside patient care. For most of the analyses in this report, the focus is on the approximately 65,000 active, non-federal, patient-care physicians who have completed their residency programs.
- California still has sufficient (to more than enough) physicians overall. The state had about 190 physicians per 100,000 population in 2000. This ratio is higher than the upper bound of the requirements estimate set forth by the Council on Graduate Medical Education (COGME). There is no evidence of large numbers of physicians leaving the state. The ratio of physicians to population has outpaced population growth in California over the past six years, rising from 177:100,000 population in 1994 to 190:100,000 in 2000.

Specialty distribution

- In 2000, slightly more than a third of California's active, patient-care physicians practiced in the generalist fields of medicine (family practice, general practice, general internal medicine, and general pediatrics). The remaining two-thirds were specialists. The generalist supply in California is around the mid-point of the COGME requirements estimate range, whereas the specialist supply is about 20% higher than the upper range of the COGME requirements estimate. Both generalist and specialist supplies have continued to increase over the past six years at faster rates than that of the general population; however specialist growth has been somewhat slower than generalist growth.

Geographic distribution

- Data on physician supply for the state as a whole belie the tremendous variation across regions in the state. The ratio of total physicians to population ranged from a high of 238 physicians per 100,000 population in the Bay Area to a low of 120 physicians per 100,000 population in the South Valley/Sierra. Regions with the state's largest metropolitan areas (Bay Area and Los Angeles) have the most robust supplies of physicians, with physicians even more likely than the general population to choose these urban areas. Three regions composed of a mix of rural areas and small to medium sized metropolitan areas (Central Valley/Sierra, Inland Empire and South Valley/Sierra) have the lowest supplies of physicians.
- Geographic maldistribution of physicians has shown little evidence of abating in recent years.
- Physician supply varies even more widely at the county level. San Francisco has the highest ratio of physicians to population (409 per 100,000 population). Twenty-five of the state's 58 counties have levels of physician supply below the lower bound of the COGME estimate of physician requirements; these are mostly rural counties outside resort areas.
- Even in counties with ample overall supplies of physicians, shortages exist in some communities, particularly those with high non-White populations.

Demographic characteristics

- Most California physicians are male and white. A plurality is between the ages of 45 and 54 years old.
- Women make up less than a quarter of the active patient-care physicians in California. However, the physician workforce is slowly but steadily approaching parity between the numbers of female and male physicians. California is about on par with national estimates that women will constitute more than a third of active physicians in the U.S. in 2020.
- Women physicians are more likely than men to choose primary care specialties and obstetrics and gynecology.
- The state's physician workforce is losing ground in terms of its racial and ethnic diversity. Of California physicians who reported their race or ethnicity in 2000, African Americans and Hispanic/Latinos each comprised less than 5% of the state's physicians although they made up about 7% and 31% of the state's population respectively. The medical education and training pipelines do not show significant advances in recent years in racial and ethnic diversity.
- Physicians of different races tend to choose different practice specialties. In contrast to the 70% of white physicians who are in the specialty fields, other races and ethnicities (such as Asian/Pacific Islander, Mexican American and Other Hispanic) have generalist/specialist distribution ratios that are closer to 50:50.

Location of medical education and training

- Only about a quarter of the physicians practicing in California in 2000 attended medical school in the state. About 50% of the state's physicians attended medical school in another U.S. state and the remaining 25% attended medical school outside the U.S.
- A slight majority (55%) of the physicians practicing in California in 2000 did their residency training in the state. The remaining 45% did their residencies outside California.

Practice organizations and practice settings

- In 1998, one third of generalist physicians and over 40% of specialists in urban California communities worked as solo practitioners. About 1 in 5 generalists and 1 in 8 specialists worked in the Kaiser-Permanente HMO system. Many California physicians practiced in single specialty or multi-specialty group practices. Overall, about one-third of generalists and one-quarter of specialists in California worked in practice settings with groups of 11 or more physicians.
- The rise and fall of new organizational entities among physicians has shaped California health care delivery over the past decade. These organizations include larger medical groups, independent practice associations (IPAs), physician hospital organizations (PHOs), and physicians practice management companies (PPMCs). Over 20 IPAs have failed in the past year. However, there are some examples in California of successful and solvent physician organizations.
- In 1998, more than 90% of the generalists in California urban areas belonged to at least one IPA, with about half participating in 2 or more IPAs. In contrast, only 58% of the specialists participated in one or more IPAs.

HMO Contracts

- In 1998, about half of generalists and one-third of specialists in urban California had the majority of their patients enrolled in HMOs (included private, Medicare, and Medi-Cal HMOs). Sixteen percent of generalists and 20% of specialists had no HMO patients in their practice.

Physician payment and earnings

- In 1998, the median net income for urban California physicians was \$120,001 – \$140,000 for generalists and \$201,001 – \$250,000 for specialists. These incomes are comparable to those reported for physicians nationwide.

- In urban California, about half of generalist physicians and one-third of specialist physicians reported in 1998 that they were paid on a salaried basis, with the remainder working under non-salaried arrangements, including self-incorporation.
- About 25% of non-salaried generalists received at least half of their income from capitation. In contrast, the vast majority (85%) of non-salaried specialists received at least half their income from fee-for-service payments.
- In California, almost 40% of primary care physicians with managed care contracts reported that their income was in part based on financial incentives in addition to the basic practice compensation they receive. Some of these physicians reported that financial incentives based on increasing productivity or reducing rates of referral created selective pressures that significant minorities of physicians perceived to compromise care; such incentives were associated with dissatisfaction among physicians. Financial incentives based on patient satisfaction or quality of care were positively associated with job satisfaction.
- National studies have found a negative impact on physician income in areas with high managed care penetration. There is also evidence that managed care penetration affects primary care physicians' income less negatively than it does specialist physicians' income.

Practice satisfaction

- Data from the 1998 California physician survey indicate that most physicians in the state are satisfied with being a physician although a noteworthy minority is dissatisfied.

Practice pressures and clinical autonomy

- In 1998, a majority of California physicians reported pressure to see more patients per day and to limit test ordering. A substantial minority indicated they believed these pressures compromised patient care. Most physicians reported not feeling pressure to limit discussion with patients about treatment options.

- A consensus in the published literature is that, for physicians, a sense of professional autonomy and job satisfaction are virtually inextricable.

Care for Underserved Californians

- A minority of California physicians appear to be providing the majority of care to Medi-Cal and uninsured patients. In 1998, over 40% of California physicians reported not participating in the Medi-Cal program. At the other end of the spectrum are the 20 – 25% of physicians with relatively heavy Medi-Cal case loads (Medi-Cal patients constituting 10% or more of these physicians' practices). Even more physicians do not have uninsured patients in their practices. About 48% of the surveyed specialists and 58% of the surveyed generalists reported having no uninsured patients.

* INTRODUCTION

The past decade has arguably been the most dynamic in the history of health care in California and the nation. A once stable, perhaps staid, system of care services, institutional structures and professional practices has become turbulent and dislocated.

These disruptions have left virtually every aspect of health care struggling to respond to new rules, tighter resources, more competition and higher expectations. In the past, physicians and their practices were relatively immune and independent from changes in health care delivery and financing systems. Today they find themselves in the very heart of the maelstrom with a daily reality that seems increasingly discontinuous with their expectations and aspirations.

Many of these attitudes are borne out of wrong or partially correct information. While considerable information is available about California's physician workforce, to date it has been spread across a number of sources and publications. With this report, selected data and information on the numbers of physicians providing patient care in the state, practice patterns and trends, education and training pipeline counts, and demographic characteristics are compiled into one document to provide a comprehensive and succinct profile of the California physician workforce around the year 2000. In addition to reporting on published data and numbers, we provide some analysis of the perceptions of and about California's physicians. Anecdotes abound in California about the tumultuous state of physician affairs. Most of these stories point to the state's rush into managed care as a destabilizing force for physician practice in California. The complaints are wide-ranging:

"Physicians are fleeing the state to escape the odious California health care market."

"Predictions of a need for more primary care physicians and fewer specialists were misguided. California now has a shortage of specialists."

“Doctors can no longer find work in places like San Francisco and Los Angeles and are moving to Fresno and Redding to hang out their shingles.”

“Physician earnings are plummeting in the state.”

“Doctors are just saying “no” to managed care and finding plenty of patients without needing to contract with managed care plans.”

At the same time that complaints and confusion about the effects of managed care on the physician workforce in California capture most of the headlines, physicians and workforce planners continue to face many additional challenges. Among these additional key questions are:

- In a state with one of the highest rates of uninsurance, how many physicians are accepting patients who are uninsured or covered by Medi-Cal?
- Is the complexion of the state’s physician supply changing along with the rapid shifts in the racial and ethnic composition of California’s population?
- What impact will the growing proportion of female physicians in California have on medical practice and patient care?
- Given the large numbers of physicians in California who trained at out-of-state medical schools and residency programs, can state legislative policies directed at the University of California exert sufficient influence on medical education and the physician “pipeline” to shape the future physician workforce for California?

In this report, we analyze multiple sources of information about the state of the physician workforce in California in an attempt to answer these questions and determine whether popular anecdotes accurately reflect the real trends occurring in California. The first section of the report includes most recent data (primarily from the American Medical Association (AMA) Masterfile) about aggregate supply (compared to requirements estimates), specialty and geographic distribution, demographic characteristics by sex, race and ethnicity, and age, and medical education and training enrollment.

The second part of the report focuses on the state of medical practice in California. This section includes references to published literature and to previously unpublished data

collected on California physicians. With this information, we present facts and figures and also provide some analysis of practice setting, physician organization, managed care involvement, Medi-Cal participation, financial incentives, earnings and physicians' experience of the practice climate in California. This report is part of a multi-phase project, which will include follow-up research in the form of a 2001 survey of California physicians to better understand some of the trends discussed here and to explore other aspects of physician practice.

Notes on the tables and charts:

- Due to rounding, percentages do not always total 100%.
- Throughout section one, unless otherwise noted, physician numbers analyzed include active, patient-care allopathic and osteopathic physicians who have completed their residencies and whose major professional activity is office-based or hospital staff, are not working in federal sites, did not report their major professional activity as "other", were not "non-classified" according the AMA data source used for the report, and were not engaged in administrative, research or teaching as their major professional activity. Parameters of data in section two may differ and are noted on figures.
- Throughout section one, unless otherwise noted, generalist physicians include physicians in the specialties of family practice, general practice, general internal medicine and general pediatrics. Specialist physicians include all non-generalist physicians. Parameters of data in section two may differ and are noted on figures.
- For information about primary data sources used, see Appendix A.

1 CALIFORNIA'S PHYSICIAN WORKFORCE: CHARACTERISTICS *and* TRENDS

AGGREGATE SUPPLY

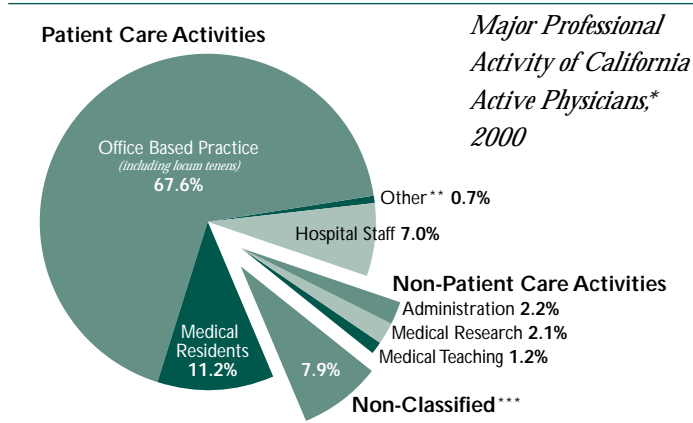
In 2000, California had almost 90,000 active allopathic and osteopathic physicians. About one in ten physicians in California is still in residency training. Of the physicians who have completed their training, most have a principal professional activity involving direct patient care either in offices or clinics (“office-based”) or in hospitals (“hospital staff”). A minority is primarily involved in teaching, research or administration, and about 8% provided insufficient information to the AMA to permit accurate classification. (Figure 1).

Most of the following sections of this report will focus on physicians actively providing direct patient care. Included in this group are the active, patient-care physicians who have completed their residency programs. Unless otherwise noted, we also exclude physicians working in federal government institutions. Using these parameters, California had about 65,000 active, patient-care physicians in 2000. Of these, 93% were office-based and 7% were hospital staff. (Figure 2).

Because of limitations in available physician data files, our estimates of physician supply are biased in a conservative direction. The data on physician supply presented in this report should

FIGURE 1

Major Professional Activity of California Active Physicians, 2000*



Major Professional Activity (MPA)	Number of Physicians
Patient Care Activities	
Office Based Practice (including locum tenens)	60,577
Hospital Staff	6,304
Medical Residents	10,070
Other**	584
Non-Patient Care Activities	
Administration	1,968
Medical Research	1,846
Medical Teaching	1,096
Non-Classified***	7,062
Total Active CA Physicians	89,507

* Not included on this table are the “inactive” physicians (physicians who are retired, semi-retired, working part-time, temporarily not in practice, or not active for other reasons and who indicated they worked 20 hours or less per week). Table includes physicians practicing in federal sites.

** Other activities include physicians employed in private industry, voluntary organizations, medical and other professional associations, in foreign countries.

*** “Non-classified” includes physicians who did not provide information on their type of practice or their present employment.

Source: AMA Masterfile, 2000.

be viewed as estimates of the minimum number of physicians practicing in the state using data that do not include counts of physicians who are non-classified by major professional activity or otherwise omitted from enumeration of active physicians in California. The numbers used in this report tend to be about 4 – 5% lower than numbers published by the AMA. (See Appendix A for primary data sources and methods used in this report).

FIGURE 2

Major Professional Activity of Active, Patient-Care Physicians in California, 2000*

Major Professional Activity (MPA)	Excluding Federal Physicians		Including Federal Physicians	
	Office Based Physicians	60,577	93%	60,577
Hospital Staff	4,521	7%	6,304	9%
Total Active Patient Care Physicians	65,098		66,881	

* Includes active patient care physicians with Major Professional Activity (MPA) of office-based (including locum tenens) and hospital staff; excludes residents, non-classified MPA, "other" MPA, inactive physicians and physicians with MPA in non-patient care activities.

Source: AMA Masterfile, 2000.

Most workforce planners evaluate the adequacy of physician supply based on the number of physicians per 100,000 civilian population. One prominent national commission, the Council on Graduate Medical Education (COGME), published ranges for physician supply requirements. According to COGME, an appropriate range for overall physician supply is 145 – 185 patient-care physicians per 100,000 population (Council on Graduate Medical Education, 1996; Council on Graduate Medical Education, 1995). Although a few critics have questioned the validity of the COGME recommendations, most workforce planners in the U.S. consider the recommendations a useful benchmark for gauging the adequacy of physician supply.

With 65,098 non-federal, patient-care physicians (excluding residents, "non-classified" and "other") active in California in 2000, the state had 190 patient-care physicians per 100,000 population (American Medical Association, 2000; California Department of Finance, 2000). California thus ranks somewhat high relative to the physician requirements estimated by COGME, exceeding the upper range of estimated requirements by 5 physicians per 100,000 population (an oversupply of about 1700 physicians). California, a state with about 14% of the total number of physicians in the U.S., has a slightly lower ratio of patient-care physicians to population than the nation overall (pending final release

of 2000 data from the AMA and U.S. Census Bureau, estimated to be between 195 and 200 per 100,000 population for the U.S. overall).

Trends in physician supply in California over the past 6 years do not support the contention that there has recently been a mass exodus of physicians from the state (Ainsworth, 2000). As can be seen in Figure 3, California's physician supply has risen from 177:100,000 population in 1994 to 190:100,000 in 2000. In terms of growth in the actual numbers of active patient-care physicians in California, this represents an increase from 55,961 in 1994 to 65,098 in 2000 (American Medical Association, 1994; American Medical Association, 2000).

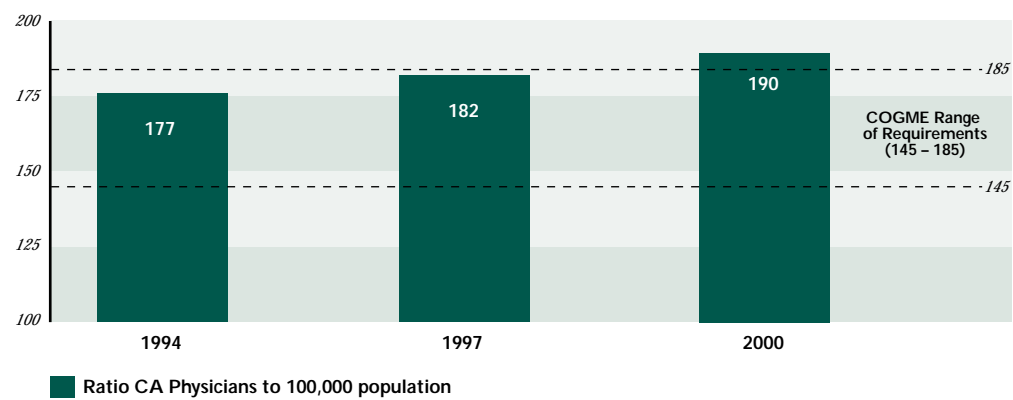


FIGURE 3
Ratio of California Active Patient-Care Physicians to 100,000 Population, 1994 - 2000*

*1994 data, n=55,961; 1997 data, n= 59,354; 2000 data, n= 65,098. Active patient care physicians with Major Professional Activity of office-based (including locum tenens) and hospital staff; excludes residents, federal physicians, non-classified MPA, "other" MPA, inactive physicians and physicians with MPA in non-patient care activities
Sources: AMA Masterfile, 1994; AMA Masterfile, 1997; AMA Masterfile, 2000; COGME 4th (1994) and 8th (1996) reports.

SPECIALTY DISTRIBUTION OF PRACTITIONERS

In addition to having the “right” total number of physicians, California should have the “right” kinds of physicians. This section provides more detailed analysis of physician supply according to major specialty groupings.

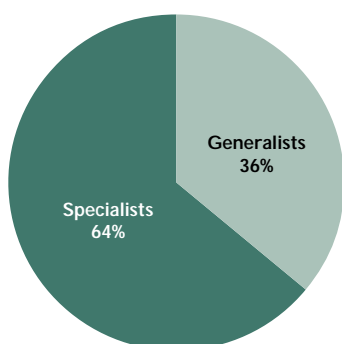
Categories of generalists and specialists

One of the most basic categorizations of physicians is into two broad groups: as generalists (primary care physicians) and as specialists. The U.S. is noteworthy for its high supply of specialists relative to the supply in many other Western industrialized nations. The U.S. has about 2 specialists for every generalist, whereas in most industrialized

nations about half of physicians are generalists and half are specialists (Starfield, 1992). Many analysts have criticized the U.S. for an overemphasis on specialization that is perceived to have contributed to escalation of health care costs, neglect of primary care services, and fragmentation of care. In the past decade, both public policies and managed care practices have promoted greater training and deployment of generalist physicians. In California for example, the state legislature initiated policies that led to a 1994 “memorandum of understanding” between the Governor and the University of California to reduce the number of specialists trained in the UC system, and to increase the number of generalists (University of California Office of the President, 1994).

In 2000, slightly more than a third of California’s active, patient-care physicians practiced in the generalist fields of medicine (family practice, general practice, general internal medicine and general pediatrics). The remaining two-thirds were specialists (American Medical Association, 2000). These ratios are comparable to national ratios (Pasko *et al.*, 2000).

FIGURE 4
California Patient-Care Physicians:
Generalists** and
Specialists*** 2000*



Generalists	23,137
Specialists	41,961
Total	65,098

* n=65,098: Active patient care physicians with Major Professional Activity of office-based (including locum tenens) and hospital staff; excludes residents, federal physicians, non-classified MPA, “other” MPA, inactive physicians and physicians with MPA in non-patient care activities.

** Family practice, general practice, internal medicine and pediatrics (AMA codes FP, IM, PD, GP, FSM, FPG, MPD).

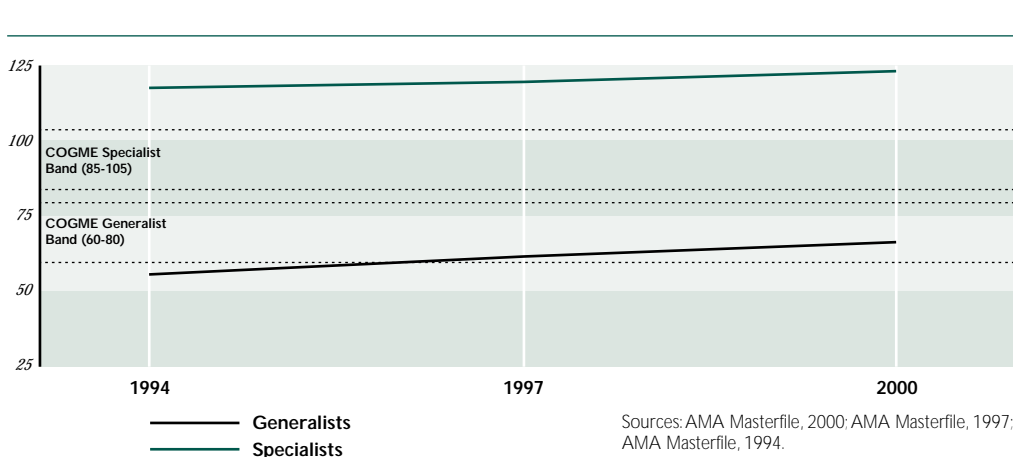
*** Non-generalists, including unspecified specialty designations.

Source: AMA Masterfile, 2000.

The Council on Graduate Medical Education, in addition to issuing recommendations for total physician supply requirements, also prepared requirements estimates for generalists (60 – 80 per 100,000 population) and specialists (85 – 105 per 100,000 population). (Council on Graduate Medical Education, 1996; Council on Graduate Medical Education, 1995). In 2000, California had about 67 generalists per 100,000 population and 122 specialists per 100,000 population. The generalist supply in California is around the mid-point of the COGME requirements estimate range, whereas the specialist supply is about 20% higher than the upper range of the COGME requirements estimate.

Although California still has many more specialists than generalist physicians, it does appear that the

growth of specialists was slower in recent years relative to the growth of generalists. As Figure 5 indicates, between 1994 and 2000 the supply of generalists in California increased from 59 to 67 per 100,000 population. During the same period, the supply of specialists increased by 4 physicians per 100,000 population, from 118 to 122 per 100,000 (American Medical Association, 1994; American Medical Association, 2000; State of California Department of Finance, 2000).



The slower increase in specialists relative to the increase in generalists, which may indicate a trend towards a redistribution of physician supply in California, is probably attributable to several factors, although a definite reason is unknown at this time. As noted above, state policy has strongly encouraged training more generalists and fewer specialists in California, at least in UC-affiliated residency programs. Furthermore, the intensely competitive managed care market in California may have discouraged some specialists from locating or maintaining their practices in the state. The rate of increase in specialist supply in California may have been blunted relative to patterns of growth in less competitive parts of the country. Finally, the increasing presence of women in medicine, who tend to choose generalist and primary care practices, may have affected the rates of increase (see also section on women in medicine).

Published research supports the notion that specialist supply may increase more slowly in regions with high managed care market shares relative to regions with less managed care. One national study of metropolitan areas found that a 10 percent increase in HMO penetration between 1986 and 1996 reduced the rate of increase of specialists (Escarce *et al.*, 2000).

FIGURE 6

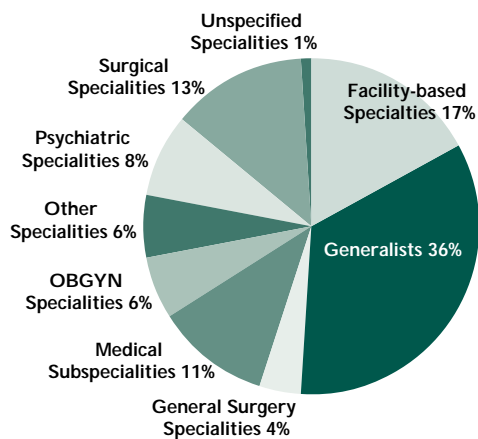
California Active Patient-Care Physicians by Specialty Category, 2000

Specialist Category	California Physicians* 2000	
	Frequency	Percent
Generalist Specialties	23,137	35.5%
OB-GYN Specialties	4,059	6.2%
Medical Subspecialties	7,212	11.1%
Facility-based Specialties	10,797	16.6%
General Surgery	2,289	3.5%
Surgical Specialties	8,476	13.0%
Psychiatric Specialties	4,870	7.5%
Other Specialties	3,720	5.7%
Unspecified Specialties	538	0.8%
Total	65,098	

* n=65,098; Active patient care physicians with Major Professional Activity of office-based (including locum tenens) and hospital staff; excludes residents, federal physicians, non-classified MPA, "other" MPA, inactive physicians and physicians with MPA in non-patient care activities.
 ** See Appendix A for list of specialty categories.
 Sources: AMA Masterfile, 2000.

FIGURE 7

Distribution of California Active Patient-Care Physicians by Specialty Category, 2000



Source: AMA Masterfile, 2000.

Another national study concluded that physicians completing specialist residency training between 1989 and 1994 tended to avoid locating their first practice in metropolitan areas with high HMO market shares (Escarce *et al.*, 1998).

The data shown in Figure 5 indicate that public policy and the managed care environment in California may have had a modest effect on slowing the rate of growth of specialists relative to the rate of growth of generalists. However, the magnitude of this effect falls well short of the “reverse gold rush” anecdotes that suggest a mass exodus of specialists from California. Specialist supply has continued to increase over the past six years at a faster rate than that of the overall population, albeit somewhat more slowly than the rate of increase for generalists.

Detailed generalist/specialist analysis

Medicine now encompasses more than one hundred specialty fields. These can be grouped into eight categories (see Appendix B for list of specialties by category). Figures 6 and 7 provide breakdowns of California’s physicians by specialty category. Additional analysis of specialty choice by sex and among physicians of different races and ethnicities can be found on pages 21 – 25 and in Appendix C.

GEOGRAPHIC DISTRIBUTION

Data on physician supply for the state as a whole belie the tremendous variation in physician supply that exists across regions within the state. While both the state's general and physician populations are concentrated in large metropolitan areas such as Los Angeles, San Diego, and the San Francisco Bay Area, physicians are even more likely than the population as a whole to choose these large urban areas. As a result, much of the Central Valley and eastern portions of California have ratios of physicians to population that are below COGME's recommended minimum requirements, despite the overall abundance of physicians in the state.

Figures 8 – 10 illustrate the distribution of patient-care physicians in California by region in 2000. These maps present ratios of total physicians, specialist physicians and generalist physicians to 100,000 population in 10 regions. (See Appendix D for a list of counties in each of the regions). The ratio of total physicians to population ranged from a high of 238 physicians per 100,000 population in the Bay Area to a low of 120 physicians per 100,000 population in the South Valley/Sierra. Regions encompassing the state's largest metropolitan areas (Bay Area and Los Angeles) have the most robust supplies of physicians. Three regions composed of a mix of rural areas and small to medium sized metropolitan areas (Central Valley/Sierra, Inland Empire and South Valley/Sierra) have the lowest supplies of physicians. Four of the state's regions (Bay Area, Los Angeles, North Valley/Sierra and Orange) have total numbers of patient-care physicians that exceed the upper bound of COGME's estimated requirements.

Compared to the COGME benchmarks, most regions have more ample supplies of specialist physicians than of generalist physicians. Six regions have supplies of specialists that exceed the upper bound of COGME's requirements for specialists, whereas only one region (Bay Area) has a supply of generalists that exceeds the upper bound for generalists. Three rural regions have supplies of generalists that fall below the lower bound of the COGME requirement band for generalists (Central Valley/Sierra, Inland Empire, South Valley/Sierra).

FIGURE 8

Supply of Total Patient-Care Physicians* per 100,000 Population by Region,** 2000



* n=65,098: Active patient care physicians with Major Professional Activity of office-based (including locum tenens) and hospital staff; excludes residents, federal physicians, non-classified MPA, "other" MPA, inactive physicians and physicians with MPA in non-patient care activities.

** See Appendix D for counties included in each region.

See Appendix E for data values.

Sources: AMA Masterfile, 2000; CA Department of Finance, May 2000; COGME 4th (1994) and 8th (1996) report.

FIGURE 9

Supply of Patient-Care Specialist Physicians* per 100,000 Population by Region,** 2000



* n=41,961: Active patient care specialist physicians with Major Professional Activity of office-based (including locum tenens) and hospital staff; excludes residents, federal physicians, non-classified MPA, "other" MPA, inactive physicians and physicians with MPA in non-patient care activities. Specialists include non-generalist physicians (See Appendix B).

** See Appendix D for counties included in each region.

See Appendix E for data values.

Sources: AMA Masterfile, 2000; CA Department of Finance, May 2000; COGME 4th (1994) and 8th (1996) reports.

FIGURE 10

Supply of Patient-Care Generalist Physicians* per 100,000 Population by Region,** 2000



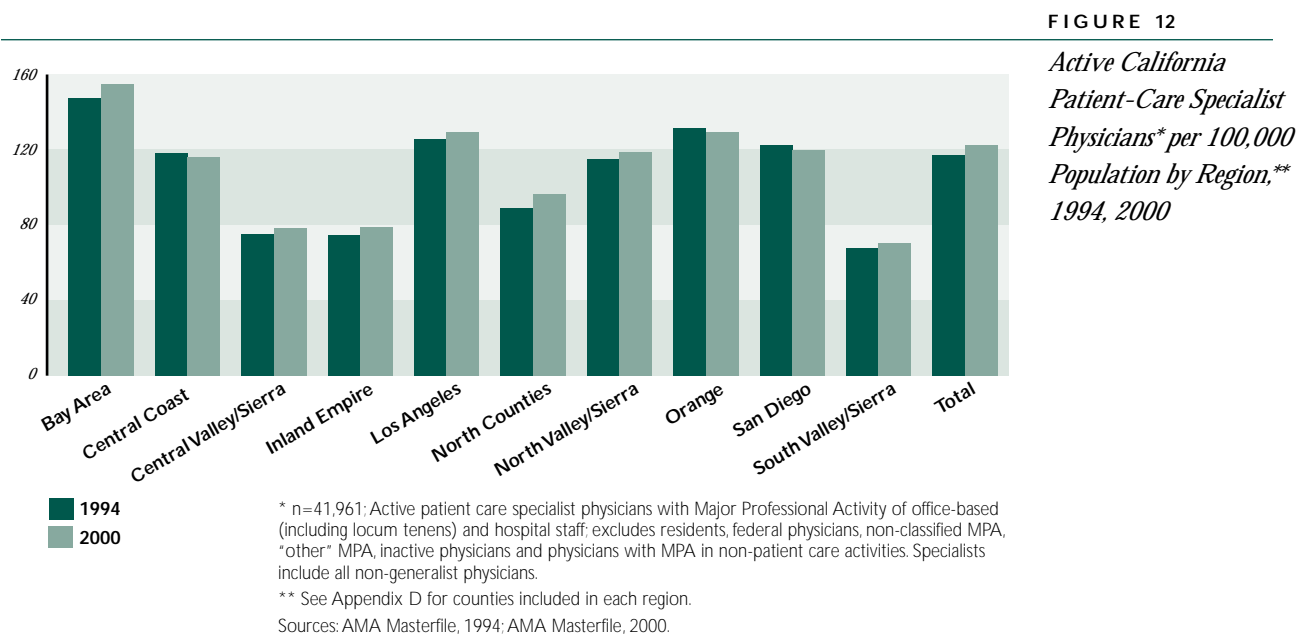
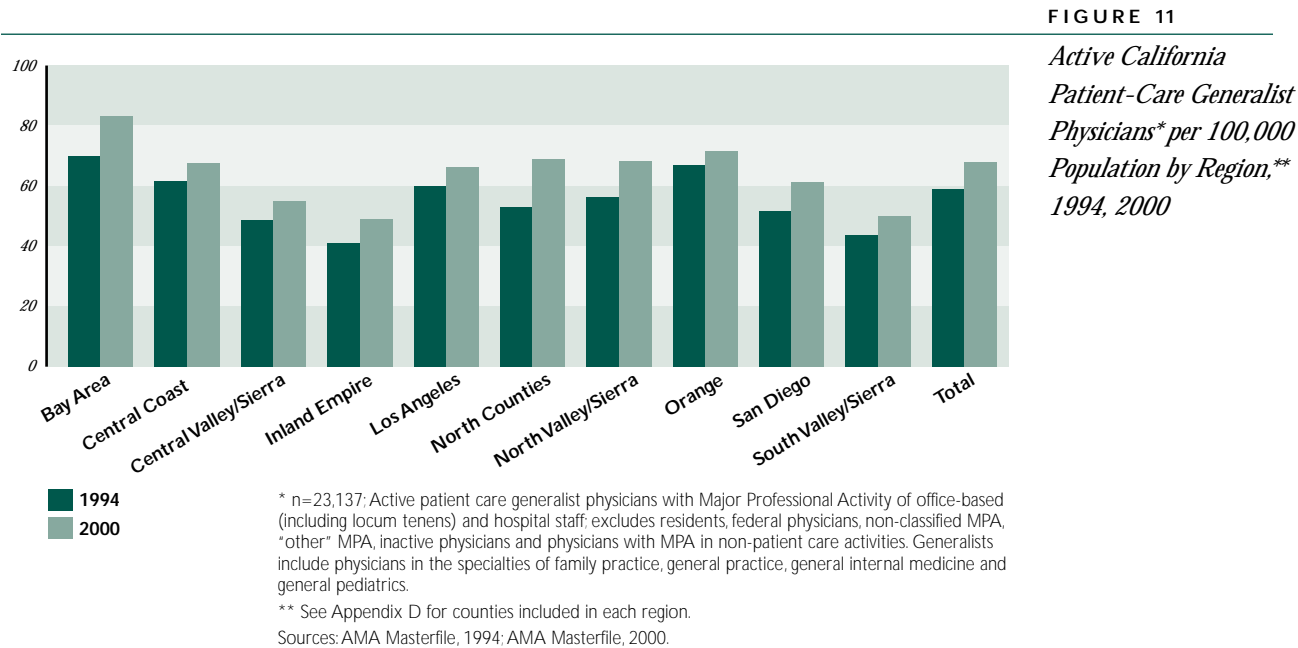
* n=23,137; Active patient care generalist physicians with Major Professional Activity of office-based (including locum tenens) and hospital staff; excludes residents, federal physicians, non-classified MPA, "other" MPA, inactive physicians and physicians with MPA in non-patient care activities. Generalists include physicians in the specialties of family practice, general practice, general internal medicine and general pediatrics.

** See Appendix D for counties included in each region.

See Appendix E for data values.

Sources: AMA Masterfile, 2000; CA Department of Finance, May 2000; COGME 4th (1994) and 8th (1996) reports.

Geographic maldistribution of physicians has shown little evidence of abating in recent years in California. As Figures 11 and 12 show, between 1994 and 2000 there has been little convergence in physician supply between the “have” and “have-not” regions of the state. These data suggest that despite the highly competitive environment in densely supplied areas such as San Francisco and Los Angeles, physicians have not migrated to less competitive, lower supply regions in California in sufficient numbers to meaningfully alter the overall pattern of geographic maldistribution in the state.



Physician supply varies even more widely at the county level. San Francisco County has the highest ratio of physicians to population (409 per 100,000 population). Six of the 10 counties with the highest ratios of physicians to population were located in the Bay Area region. Twenty-five of the state's 58 counties have levels of physician supply below the lower bound of the COGME estimate of physician requirements. Rural counties outside resort areas generally have the lowest ratios of physicians to population. Specialists are concentrated in urban counties and in rural counties with small metropolitan areas with hospitals that serve as regional referral centers for specialty care such as Butte (Chico) and Shasta (Redding). (See Appendix F for a table listing numbers of physicians and ratios of physicians to population by county).

Even in counties with ample supplies of physicians, shortages exist in some communities, particularly those with high non-white populations. To assess the supply of physicians in small areas, the California Office of Statewide Health Planning and Development (OSHPD) has divided the state into 487 Medical Services Study Areas (MSSAs). MSSAs are sub-county aggregations of census tracts that are considered rational service areas for primary care. Urban MSSAs typically encompass neighborhoods within cities. Rural MSSAs cover much larger but less densely populated areas and generally consist of individual towns and the surrounding countryside. OSHPD uses MSSAs to determine which areas of the state are eligible for designation as Primary Care Health Professions Shortage Areas (HPSAs). Designation of an area as a HPSA enables health care organizations in that area to receive more generous reimbursement from Medi-Cal and Medicare and to recruit health professionals through National Health Service Corps programs. To be eligible for designation, an area must have fewer than 1 primary care physician per 3,000 persons. An area can be designated as a Primary Care HPSA for the entire population or for persons with low incomes. Certain health care facilities that provide care to underserved populations are also eligible for designation.

As of December 8, 2000, there were 153 Primary Care HPSAs in California (Office of Statewide Health Planning and Development (OSHPD), 2000). There were 109 rural Primary Care HPSAs, 28 Urban Primary Care HPSAs and 16 facility-based Primary Care HPSAs. Most urban areas designated as Primary Care HPSAs are low-income neighborhoods with high non-white populations, such as East Los Angeles.

DEMOGRAPHIC CHARACTERISTICS

Counts of physicians by specialty and by county tell only part of the story of the physician workforce in California. Another major consideration is how well the physician workforce reflects the demographic profile of the state population overall, particularly in terms of sex and race/ethnicity. Currently, most California physicians are male and white. The largest age cohort are those between the ages of 45 and 54. Two contrary trends emerge from an analysis of the demographics of physicians in California:

- A physician workforce that is slowly but steadily approaching parity between the numbers of female and male physicians, and
- A physician workforce that is losing ground in terms of its racial and ethnic diversity, especially in the context of a state that no longer has a majority of non-Latino White residents.

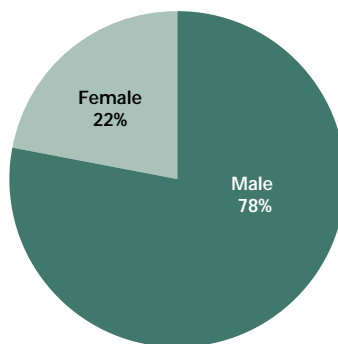
Gender

Although women have been entering the field of medicine in steadily increasing numbers over the past several decades, men still make up over three-quarters of the physicians providing patient care today in California (American Medical Association, 2000). (Figure 13).

A glimpse “upstream” in the educational pipeline shows that the proportion of women in medicine will continue to increase in coming years due to the ever-growing presence of women in medical school and residency training. In 1998, there were 3,300 women in California residency programs, making up approximately 39% of all trainees (American Medical Association, 1998). (Figure 14).

FIGURE 13

California Active Patient-Care Physicians by Sex, 2000*



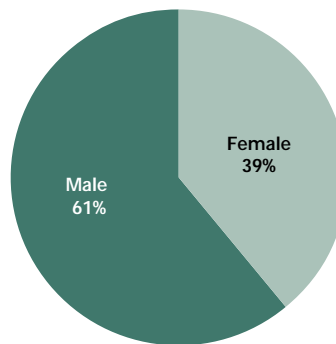
Female	14,183	22%
Male	50,915	78%
Total	65,098	

* n=65,098: Active patient care physicians with Major Professional Activity of office-based (including locum tenens) and hospital staff; excludes residents, federal physicians, non-classified MPA, “other” MPA, inactive physicians and physicians with MPA in non-patient care activities.

Source: AMA Masterfile, 2000.

FIGURE 14

California Physicians in Residency Training Programs by Sex, 1998



Female	3,346	39%
Male	5,188	61%
Total *	8,540	

* Total includes 6 no response.

Source: AMA GME database, 1998.

FIGURE 15

Physicians in California Residency Training Programs by Race/Ethnicity and Sex, 1998

	Male	Female
Asian/Pacific Islander	1,395	877
Black, non-Hispanic	168	167
Hispanic/Latino*	275	165
Native American/AK Native	20	7
White, non-Hispanic	2,545	1,537
Other	333	244
Unknown	168	116
Missing Cases (n=523)		

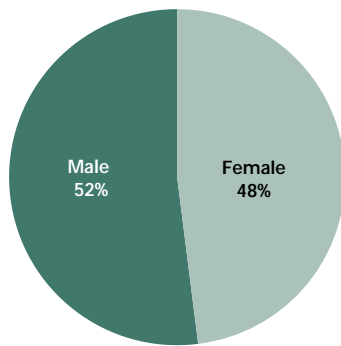
* Includes Mexican American, other Hispanic and Puerto Rican.
Source: AMA GME Database, 1998.

When residency numbers are analyzed by both sex and race/ethnicity, they indicate that women are participating in medicine at lower rates than their male peers of the same race and ethnicity except for non-Hispanic Blacks, where men and women are participating at similar rates. (Figure 15).

Because many of California's practicing physicians completed their residency training in other states, national data on women in residency training are also of relevance for projecting the future gender composition of the California physician workforce. Nationally, women have made up steadily increasing percentages of the total number of residents in U.S. residency programs, rising from 34% in 1995 to 38% in 1999 (Journal of the American Medical Association, Annual Medical Education Issues, 1996, 2000).

FIGURE 16

California Medical School Matriculants by Sex, 2000–2001



Female	495	48%
Male	540	52%
Total	1,035	

Source: AAMC Selected Data, October 23, 2000.

Women are enrolling in California medical schools at rates even higher than those for residency programs. California medical school matriculants for the 2000-01 academic year included 495 (nearly 48%) women out of 1,035 total students. (Figure 16). They constitute between 42 and 51% of all students at each of the state's eight medical schools.

Nationally, the percentage of female matriculants in U.S. medical schools has risen from 38% in 1990 to 46% in 2000 (derived from Association of American Medical Colleges, 2000). (Figure 17).

Based on estimates that the percentage of women graduates of medical programs would be 46% in 2000, nearly 50% by 2003, and would remain at that level through 2020, the U.S. Bureau of Health Professions projected that women will constitute

more than one-third of active physicians in the U.S. in 2020 (Council on Graduate Medical Education, 1995).

The growing presence of women in the medical profession has prompted considerable study and analysis. To date, most of the research has been conducted at the national level. Several differences have been noted between male and female physicians. Female physicians are more likely than men to choose primary care specialties, obstetrics and gynecology, and psychiatry (Schmittiel & Grumbach, 1999). California mirrors this national trend, with women making up 29% of the total number of generalists and 31% of the total number of physicians in the obstetrics and gynecology category although they comprise less than 25% of the total number of active patient-care physicians (see Figure 18). Should these current patterns of

FIGURE 17

Female Matriculants to California and U.S. Medical Schools, 1970–2000

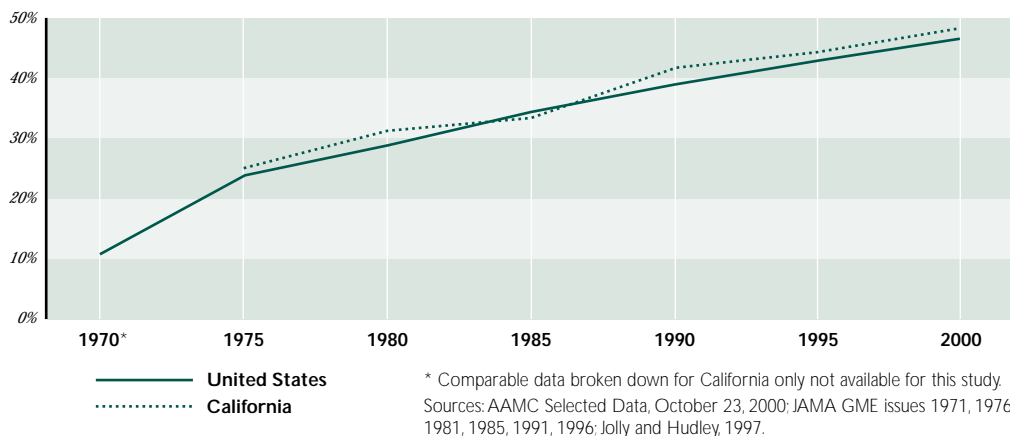
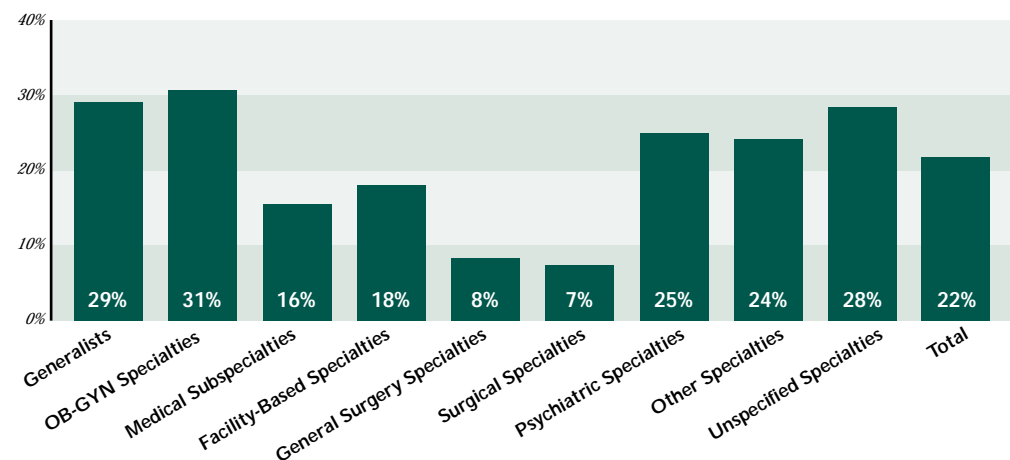


FIGURE 18

Percent of Active, Patient-Care Female Physicians by Specialty Category, California 2000



* n=65,098: Active patient care physicians with Major Professional Activity of office-based (including locum tenens) and hospital staff; excludes residents, federal physicians, non-classified MPA, *other* MPA, inactive physicians and physicians with MPA in non-patient care activities.
Source: AMA Masterfile, 2000.

specialty selection according to sex continue, the growing proportion of women in medicine would tend to shift the overall specialty balance of California physicians towards generalist fields, although the overall magnitude of this trend on specialty distribution would be fairly modest.

In addition to its implications for future specialty distribution, some observers have questioned whether the growing number of women in medicine will affect the overall work effort of the physician workforce. A recent national survey found that 22% of female physicians worked less than 40 hours per week compared to 9% of male respondents (McMurray *et al.*, 2000). Previous studies report similar discrepancies between male and female doctors in the number hours worked (Baker, 1996; Schmittiel & Grumbach, 1999).

Differences between men and women in choice of practice setting or specialty may account for some of these differences in work hours. For example, female physicians are more likely to be employees, and physicians who are employees tend to work less hours than physicians who are not. However, a 1996 study of 360 salaried primary care physicians at Kaiser Permanente Northern California still found a difference in hours worked between male and female physicians. In that HMO 58% of female physicians worked less than 90% of full time (40 hours per week) compared to 12% of male physicians. Such findings suggest that differences in practice setting (and perhaps specialty choice) may not fully account for differences in hours worked (Schmittiel & Grumbach, 1999).

Such differences in work hours between male and female physicians will probably have only modest effects on overall physician work effort. For example, if the proportion of women in medicine increases over the next 20 years from 22% to 37%, and women work a hypothetical average of 20% fewer hours per week than men, this would result in only a 3% decline in overall work hours for the physician workforce of 2020 compared to the work hours that would have been generated by a physician workforce in 2020 that remained 22% female (i.e., $(37\% - 22\%) \times 20\% = 3\%$). The growing presence of women in medicine, may, however, provide the impetus to move to work environments that accommodate family lives for all physicians, with potentially more global effects on work hours.

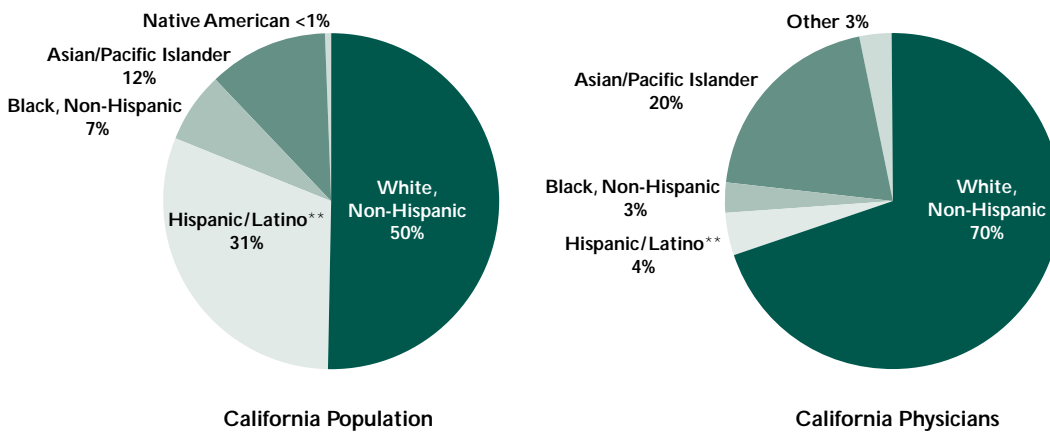
Differences in incomes between female and male physicians have prompted several studies and analyses. As in other occupations, female physicians make significantly less

than male physicians (Hadley & Mitchell, 1999; McMurray, 2000; Schmittiel & Grumbach, 1999). Research has come to conflicting conclusions about whether income differences are explained by differences between female and male physicians in specialty, practice setting, work hours, and other factors (Baker, 1996; Hadley & Mitchell, 1999). One recent large national study still found a \$22,000 gender gap in income after controlling for age, minority status, specialty, practice type, time in current practice, Medicaid or uninsured status of patients, regional salary variations, ownership status of practice, number of hours worked per week, and proportion of hours spent in hospital-based activities (McMurray *et al.*, 2000). Further research is needed in this area.

Race and ethnicity

As with gender representation, California’s physician population does not reflect the racial and ethnic diversity of its general population. However, in contrast to workforce discrepancies in sex, where women are showing slow but steady increases in representation, racial and ethnic parity remains an elusive goal. Of California physicians who reported their race or ethnicity in 2000, African Americans and Hispanics/Latinos each comprised less than 5% of California’s physicians although they made up about 7% and 31% of the state’s population respectively (American Medical Association, 2000; State of California Department of Finance, 2000). Whites and Asians are overrepresented among physicians relative to the state’s general population.

FIGURE 19
California Physicians and Population by Race/Ethnicity, 2000*



* n=44,555: Active patient care physicians with Major Professional Activity of office-based (including locum tenens) and hospital staff; excludes residents, federal physicians, non-classified MPA, "other" MPA, inactive physicians and physicians with MPA in non-patient care activities; also excludes 20,543 respondents for whom data on race/ethnicity is unknown.
 ** Includes Mexican American, other Hispanic and Puerto Rican.
 Sources: AMA Masterfile, 2000; CA Department of Finance Population Projection for July 2000, December 1998.

A primary concern about lack of racial and ethnic diversity in the physician workforce is its effect on access to care. A 1999 literature review found a positive relationship between racial/ethnic diversity in the health professions and improved access to health care for traditionally underserved populations (Dower *et al.*, 1999). Multiple studies — including those focused on California — have found that African American and Latino physicians are more likely to practice in medically underserved communities and to care for greater numbers of racial and ethnic minority patients (Cantor, Miles *et al.*, 1996; Keith *et al.*, 1985; Komaromy *et al.*, 1996; Moy & Bartman, 1995; Xu *et al.*, 1997). In 1998, 58% of underrepresented minority¹ graduates of California medical schools intended to practice in an underserved area, compared to 19% of non-Latino white graduates and 19% of other minority graduates (Grumbach *et al.*, 1999).

There has been some discussion about looking to international medical graduates (physicians who complete their medical school education outside of the U.S.) to help ameliorate the lack of diversity in California's physician workforce. However, most international medical graduates (92%) are not members of traditionally underrepresented minorities (American Medical Association, 1998).

In addition to the impact on access to health care, lack of representational diversity in the physician workforce raises issues of social justice and the future of the profession. For example, individuals who are granted the privilege of being a licensed physician receive direct benefits for themselves and their families in the forms of high income, health care coverage and relatively good health status (Dower *et al.*, 1999). However, a profession that is not racially and ethnically diverse will likely have insufficient numbers of role models and mentors to attract traditionally underrepresented minorities.

Physicians of different races tend to choose different specialties of practice. Figure 20 provides a summary of the race and ethnicity of California physicians² categorized by

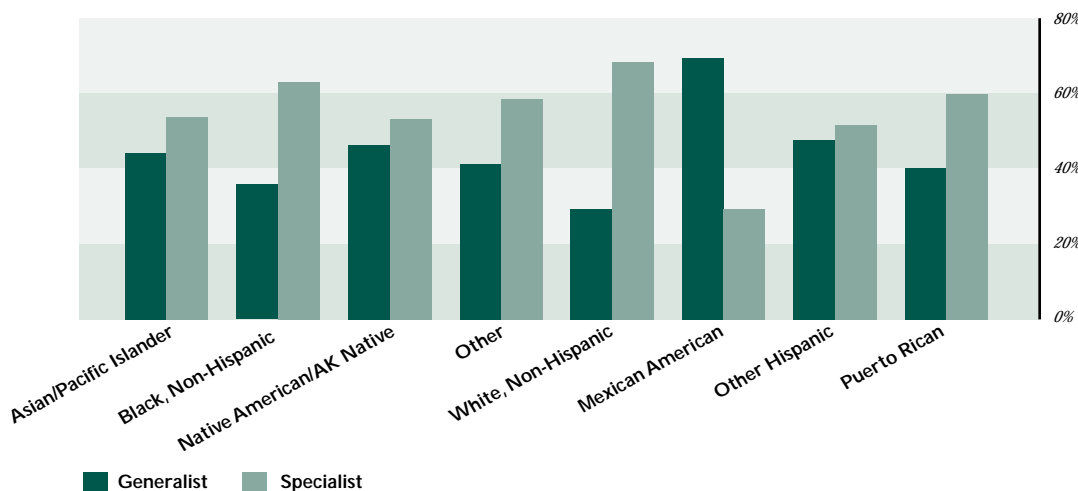
¹ The generally accepted definition of underrepresented minorities in medicine includes Blacks, Mexican Americans, Native Americans and mainland Puerto Ricans. Jolly, P., & Hudley, D. M. (Eds.). (1997). *AAMC Data Book: Statistical Information Related to Medical Education* (January 1997 ed.). Washington DC: AAMC.

² Data shown are limited to the physicians who provided information on race or ethnicity to the AMA. Almost a third of California's active, patient-care physicians declined to provide information about their race. However, survey data indicate that most of the physicians who did not provide race or ethnicity information are white. (Bindman *et al.*, 1998a).

generalist and specialist fields. In contrast to the 70% of white physicians who are in the specialty fields, about 70% of Mexican American physicians practice primary care/generalist medicine (although we note that the total number of Mexican American physicians in California is very small and that many may be counted in the “Other Hispanic” category). Other races and ethnicities (such as Asian/Pacific Islander and Other Hispanic) have generalist/specialist distribution ratios that are closer to 50:50. See Appendix C for further breakdown of physicians by race/ethnicity and specialty.

FIGURE 20

California Active Patient-Care Physicians by Specialty and Race/Ethnicity, 2000*



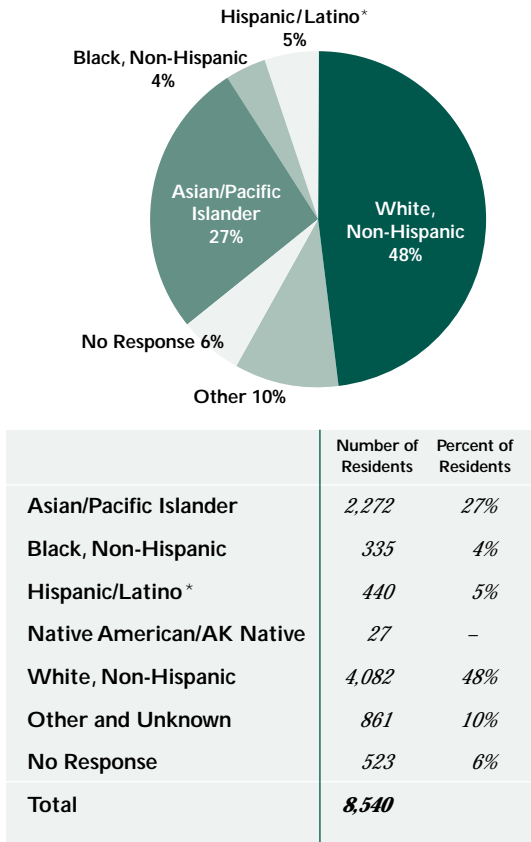
	Generalists	Specialists **
Asian/Pacific Islander	3,958	4,894
Black, Non-Hispanic	458	833
Native American/AK Native	16	18
White, Non-Hispanic	9,452	21,707
Hispanic		
Mexican American	80	34
Other Hispanic	816	906
Puerto Rican	2	3
Other	566	812
Unknown	135	58
Total	15,483	29,265

* n=44,748; Active patient care physicians with Major Professional Activity of office-based (including locum tenens) and hospital staff; excludes residents, federal physicians, non-classified MPA, "other" MPA, inactive physicians and physicians with MPA in non-patient care activities; also excludes 20,350 for whom data on race/ethnicity is not known.

** See Appendix C for further information on physicians by race/ethnicity and specialty. Source: AMA Masterfile, 2000.

FIGURE 21

California Physicians in Residency Training by Race/Ethnicity, 1998



	Number of Residents	Percent of Residents
Asian/Pacific Islander	2,272	27%
Black, Non-Hispanic	335	4%
Hispanic/Latino *	440	5%
Native American/AK Native	27	-
White, Non-Hispanic	4,082	48%
Other and Unknown	861	10%
No Response	523	6%
Total	8,540	

* Mexican American, other Hispanic and Puerto Rican.
Source: AMA GME Database, 1998.

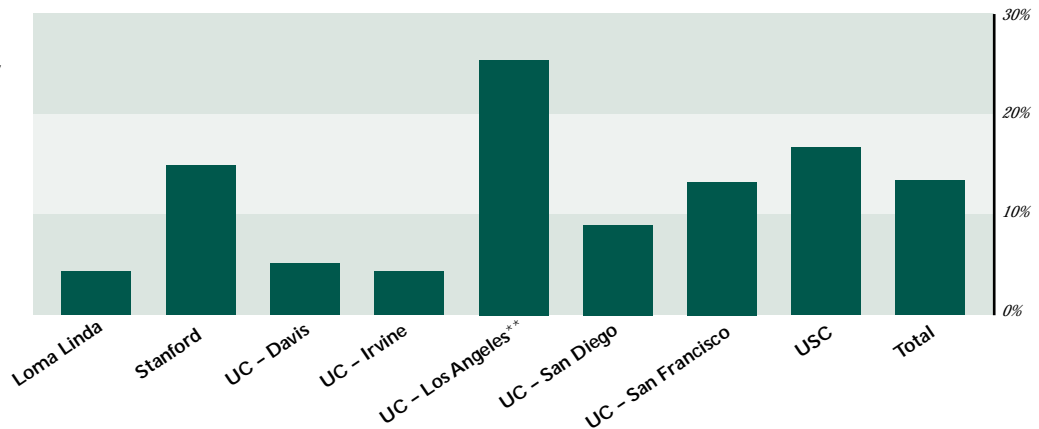
One can look to the education and training pipeline of medical school and residency programs to see the trends that will shape the future racial and ethnic profile of California's physicians. Residents in California programs who reported their race/ethnicity in 2000 included less than 5% each for Black and Hispanic/Latino, indicating no significant improvement in the diversity of the physician workforce for the near future. (Figure 21).

Nationally, the percentages of underrepresented minorities in all U.S. residency programs have not increased between 1995 and 1999 (Journal of the American Medical Association, Annual Medical Education Issues, 1996 – 2000).

For the 2000 – 2001 academic year, the percentage of underrepresented minorities matriculating at California's eight medical schools ranged from 4% to 26% (see Figure 22 and Grumbach *et al.*, 1999 for more detailed information). Nationally, the percentage of

FIGURE 22

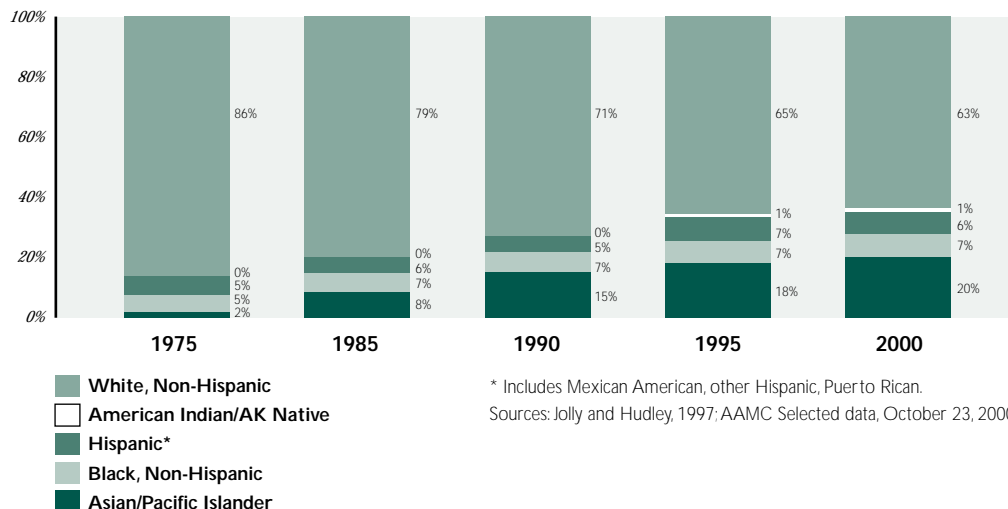
Underrepresented Minority Matriculants at California Medical Schools, 2000



* AAMC defines underrepresented minorities as blacks, Mexican-Americans, Native Americans and mainland Puerto Ricans.
** UCLA includes Charles R. Drew University of Medicine and Science.
Source: AAMC Selected data, October 23, 2000.

FIGURE 23

U.S. Medical School Matriculants by Race/Ethnicity, 1975 - 2000



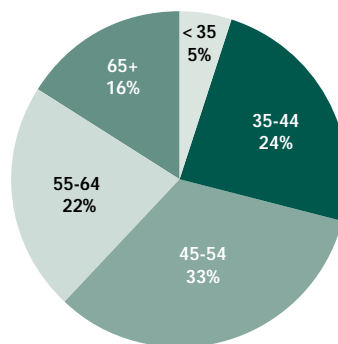
underrepresented minority medical school matriculants has risen only about 4 percent (from 10% to 14%) over the 25-year period from 1975 to 2000, and has actually declined slightly from 15% to 14% between 1995 and 2000. (Figure 23). Decreases have been most pronounced since 1995 in California medical schools.

Age

The largest age cohort of California physicians are those 45 – 54 years old, who make up 32% of the state’s active, patient-care physicians. Physicians are distributed across all age cohorts, with 7% of the workforce in the 25 – 34 year old group and 15% of the active physician workforce in the cohort over 65 years of age. (Figure 24).

FIGURE 24

California Active Patient-Care Physicians by Age, 2000*



* n=65,098; Active patient care physicians with Major Professional Activity of office-based (including locum tenens) and hospital staff; excludes residents, federal physicians, non-classified MPA, "other" MPA, inactive physicians and physicians with MPA in non-patient care activities.
Source: AMA Masterfile, 2000.

LOCATION OF MEDICAL EDUCATION AND TRAINING

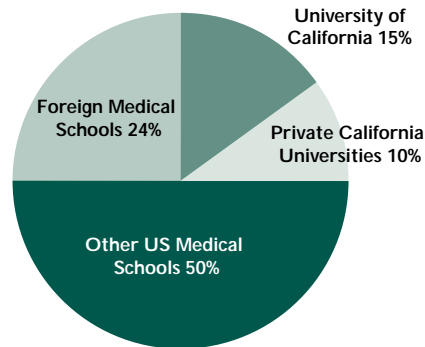
States have jurisdiction over licensing of physicians, and California makes a major public investment in training physicians at the University of California programs and through other educational programs. However, the physician and medical education market operates on a national scale, with considerable geographic mobility of physicians at different stages of their medical careers.

Medical students

Only about a quarter of the physicians practicing in California in 2000 attended medical school in the state. About 50% of the state's physicians attended medical school in another U.S. state and the remaining 25% attended medical school outside the U.S. (Figure 25).

FIGURE 25

*Medical Schools
Attended by California
Active Patient-Care
Physicians, * 2000*

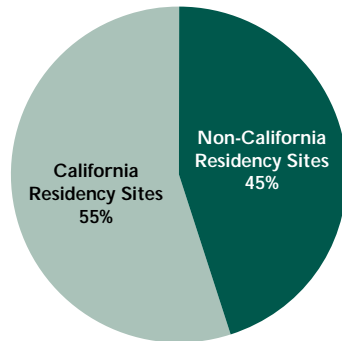


* n=65,098: Active patient care physicians with Major Professional Activity of office-based (including locum tenens) and hospital staff; excludes residents, federal physicians, non-classified MPA, "other" MPA, inactive physicians and physicians with MPA in non-patient care activities.

Source: AMA Masterfile, 2000.

FIGURE 26

*Residency Sites
of California Active
Patient-Care
Physicians, * 2000*



* n=65,098: Active patient care physicians with Major Professional Activity of office-based (including locum tenens) and hospital staff; excludes residents, federal physicians, non-classified MPA, "other" MPA, inactive physicians and physicians with MPA in non-patient care activities.

Source: AMA Masterfile, 2000 (derivation).

Residents

In contrast to medical school attendance, a slight majority (55%) of physicians practicing in California trained in residency programs in the state. The remaining 45% did their residency outside California. (Figure 26). State policy therefore may have a slightly greater impact when directed to residency programs compared to medical school programs in California.

Overall, the large proportion of practicing physicians in California who went to medical school or completed residency training in other states suggests that state-based policies will have only a limited effect on shaping the future physician workforce in California. The future California physician workforce will inevitably be influenced by trends in medical education occurring throughout the U.S.

2 | THE STATE OF MEDICAL PRACTICE *in* CALIFORNIA

Section I of this report focused on features of the California physician workforce that can be counted: numbers of total physicians, counts of physicians by specialty and region, proportions of physicians by sex and race/ethnicity, etc. Most of these data derived from data sets such as the AMA Physician Masterfile that are comprehensive in their ability to enumerate physicians but limited in the amount of information included about each physician. Other data sources are required to explore in more detail important aspects of medical practice in California.

In Section II of the report, we analyze practice setting, physician organizations, managed care involvement, Medi-Cal participation, financial incentives, earnings, and physicians' experience of the practice climate in California. For this section, we rely primarily on published literature and on previously unpublished data from a series of surveys of a representative sample of California physicians conducted in 1998 by members of our UCSF study team (see Appendix A for more information). These data have two important limitations:

- Physicians were sampled from a limited number of specialties: family practice, general practice, general internal medicine, general pediatrics, obstetrics-gynecology, cardiology, endocrinology, neurology, gastroenterology, general surgery, orthopedic surgery, and ophthalmology. Almost half of all California physicians are in these 12 specialties.
- Physicians were sampled only from the 13 largest urban counties of California. Nearly 80% of Californians reside in these 13 counties. Some counties designated as urban also encompass rural subregions.

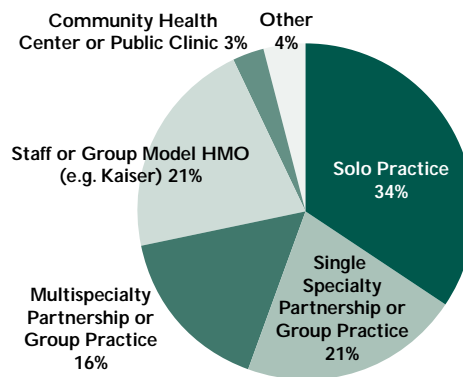
Because of these limitations, the data in this section may not be completely generalized to all of California. However, these survey data are unique in their amount of detail about physician practice in California, and describe many physicians working in the most heavily populated areas of the state.

THE ORGANIZATION OF MEDICAL PRACTICE

The settings in which physicians practice and the practice associations with which they affiliate are key components of the practice of medicine in California today (see next page on the Rise of Physician Organizations for an overview). In terms of practice setting, solo practice remains popular for physicians in California. One-third of generalist physicians and over 40% of specialists in urban California worked as solo practitioners in 1998. On the other hand, about 1 in 5 generalists and 1 in 8 specialists in California worked in the Kaiser-Permanente HMO system (“group-model HMO” practice settings), representing one of the most highly organized, group practice structures in the U.S. Many California physicians practiced in single specialty or multi-specialty group practices. (Figures 27 and 28). Overall, about one-third of generalists and one-quarter of specialists in California worked in practice settings with groups of 11 or more physicians. (Figure 29).

FIGURE 27

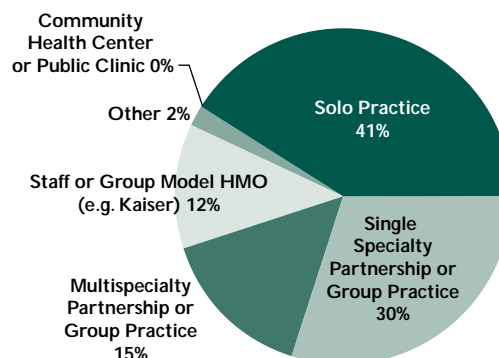
*Main Practice
Setting, California
Generalists, 1998*



* Includes only physicians in urban communities. Generalists include physicians in obstetrics-gynecology, family practice, general internal medicine, general practice, and general pediatrics.
Source: Bindman *et al.*, 1998a.

FIGURE 28

*Main Practice
Setting, California
Specialists, 1998*



* Includes only physicians in urban communities.
Source: Bindman *et al.*, 1998a.

Rise of Physician Organizations

One of the most important variables shaping reality for physicians in California is the type and health of the organizations that exist to deliver medical services. The traditional, solo or small (2 to 3 practitioners) completely independent practice has long since given way to more complex and varied forms of organization. The creation of these organizational entities has come about in response to the opportunities and demands (or perceived demands) in a managed care marketplace. These new patterns of organization are distinctive in California, vary in their character and success, and are beset by a fairly common set of problems and considerations.

California has historically been home to alternative approaches to the organization of health care and physician services. The relationship between the Kaiser Health Plan and the Permanente Medical Group is a long-standing testament that alternatives to small private practices can exist and provide care that serves the needs of health care consumers and purchasers alike. As the penetration of managed care increased in the privately insured population in the 1980s, and the prospect that public insurance would transform itself in a similar manner in the 1990s, both health plans and hospital systems began a process of aggregation and consolidation that created larger and larger systems of health services. Similarly, and in response to these changes, physician practices in California moved from smaller independent practices to larger organizations with varying degrees of integration of administrative and clinical functions. These organizations demonstrated a willingness to strike new relationships with both the traditional (hospitals) and new players (health plans and management companies) in the health care markets.

One of the distinctive qualities of this movement in California was the willingness, in fact insistence, of physician organizations to take on much of the medical decision making and financial management from the

health plans. This “delegated” model dominated physician organization through the 1990s. Though varied, this transformation took four, non-exclusive forms: larger medical groups (particularly among those already organized, such as Palo Alto Medical Foundation in the Bay region); alignment of small practices and medical groups into the distinctively California brand of independent practice organizations (IPAs, such as Hill Physicians in the East Bay and Sacramento area of northern California); similar alignment with the nascent hospital systems typically through physician hospital organizations (PHOs such as Alta Bates Medical Associates in Berkeley); and amalgamation of practices under the publicly traded physician practice management companies (PPMCs such as MedPartners in southern California).

Each of these new forms of physician organization took on many of the functions that elsewhere in the country were handled by managed care plans. Capitated payments to the physician entities became the norm as they assumed risk and responsibility for authorizations, referrals, utilization management, network credentialing, claims, and quality assessment (Grumbach *et al.*, 1998a). As capitated payments shadowed fee-for-service premiums through the mid-1990s the revenue base grew and each of these types of physician-controlled organizations seemed to be financially successful. These forms of physician organization came to dominate the California delivery picture by 1997, outperforming traditional managed care such as Kaiser and making entry by other arrangement entities such as physician provider organizations (PPOs) very difficult. In their robust performance they became the idealized embodiment of the provider service organization (PSO) and, true to the expectation of federal policy makers, actively sought both Medi-Cal and Medicare enrollees for their managed care panels.

Over the past two years a number of problems have beset the physician-dominated organizations in

(continued on next page)

Rise of Physician Organizations *(continued)*

California (Parrish, 2000). First and most obvious has been a dramatic decline in both the private and public payments for medical services. Highly organized purchasers pushed lower premiums through to highly organized health plans that pushed them along to physician organizations that were ill-equipped or ill-prepared to manage the capitation payment. This has led to steady erosion of the financial position of many physician organizations. Declining revenue has been met by a growing demand for services by consumers who generally remain immune from any direct impact of the cost implications of these demands. The earlier discipline on the consumer imposed by the dominant private sector purchaser (the employer) has disappeared in the tight economy and low unemployment of the past few years. This has left the physician organization in California the task of getting to the consumer what they want and when and where they want it, but being paid on a severely reduced scale (Robinson, 1999). Finally, the costs of many of those health care services that physician organizations incorporated into their capitated rate unexpectedly rose. Much of this increase was beyond the control of physicians or their organizations. Most notable was the overall cost increase of pharmaceuticals, but a full range of ancillary services and in-patient costs have contributed to making the situation worse (Bartlett, 2000).

In addition to these external variables that have worked against the success of physician entities, most have not demonstrated that they have developed the internal core competencies to successfully manage in today's health care environment. These competencies include the ability to deploy care management techniques, ability to streamline non-clinical administrative processes such as authorization and referral, the use of information technology to manage and inform patients, and the ability to structure effective physician teams. Many simply did not have the size or scale to gather the

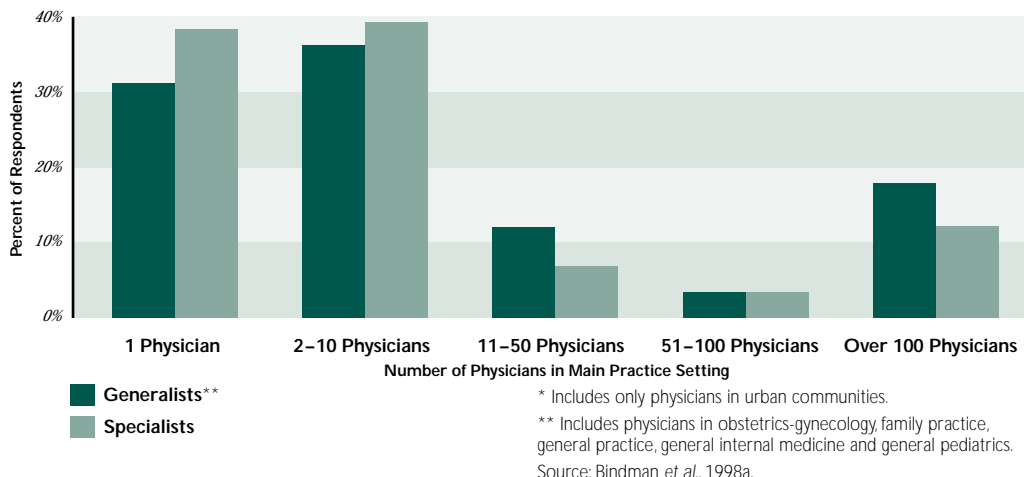
needed capital and organizational sophistication to succeed in a highly competitive environment. Others grew too fast trying to expand market share or improve profitability and were unable to accommodate the distinctively different cultures involved when aligning the traditional independent prerogatives of individual physicians and small groups. In this respect there was considerable underestimation of the scale of the task of making independent physician practices a part of a health care system. The failure to create a system, from vision and strategy to compliance with that system by the individual practice and physician is, in many ways the best general description of why physician groups have failed to live up to their early promise.

Over 20 IPAs have failed in the past year (Capitation Management Report, 2000). Physician delivery organizations were not capable of living up to all of the expectations that were placed on them, but the impact of their demise is unknown. The future direction for health care in California and the role of physicians and physician organizations seems less clear than it has been in a decade or more. A few things seem apparent:

- Physicians and how they are organized is a vital consideration of any system of health care.
- Responding to the demands of consumers and private and public purchasers in an efficient manner will require an organized response of a system of care services. (Mechanic & Rosenthal, 1999).
- Physicians must be a part of such a system in both leadership and delivery roles.

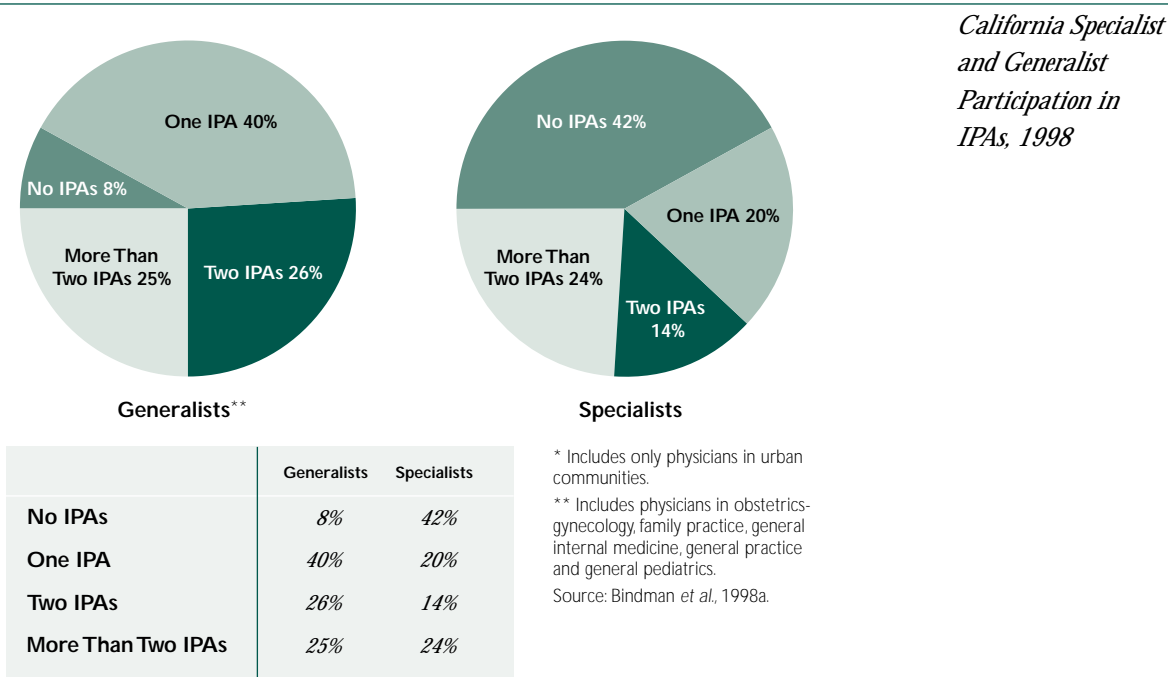
In California there are examples of successful and solvent physician organizations such as Hill Physicians that have effectively served consumers and member physicians. (Jaklevic, 1999; Heimoff, 1999). Learning more about their success should be a priority as we move forward in this reform.

FIGURE 29



In addition to their main practice setting, physicians today are often affiliated with larger practice associations or organizations, through which their contracting is handled. California has been at the forefront of the development of “virtual” group practices, a prominent example being the Independent Practice Association (IPA). IPAs create networks among physicians in solo and small group practice for purposes of contracting with managed care plans and performing other types of administrative functions. Physicians in IPAs usually retain ownership of their practice assets. IPAs vary in their degree of organizational cohesiveness and structure. Most office-based physicians in urban California participate in IPAs. (Figure 30). In 1998, more than 90% of the generalists in California

FIGURE 30



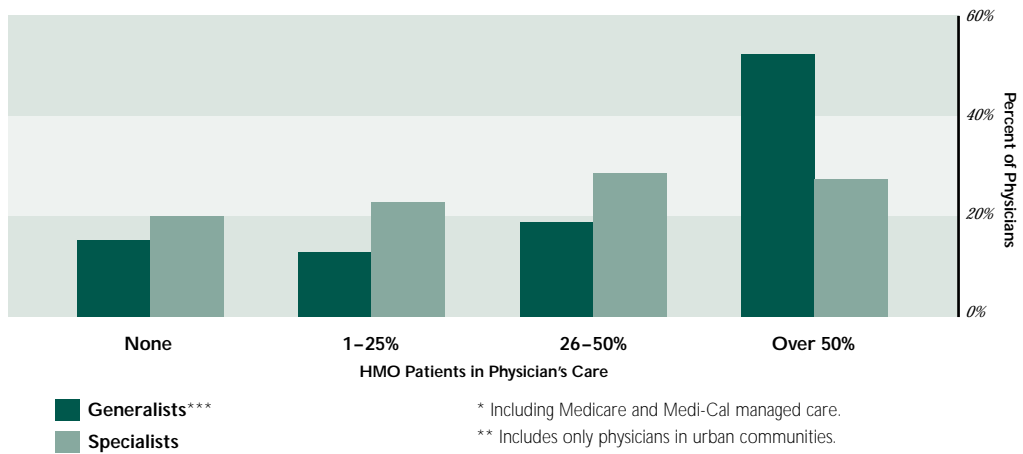
urban areas belonged to at least one IPA, with about half participating in two or more IPAs. In contrast, about 58% of the specialists participated in one or more IPAs. (See page 29 on the Rise of Physician Organizations for more about IPAs).

HMO CONTRACTS

In 1999, HMO enrollment accounted for 54% of California’s market share compared to 30% nationally; about 17 million Californians were enrolled in an HMO. California has had a rate of HMO growth among the highest in the U.S. (InterStudy, 2000). The physician survey data from 1998 bear out the prominent role of HMO contracts in physician practices in California. About half of generalists and one third of specialists in urban California had the majority of their patients enrolled in HMOs (including private, Medicare, and Medi-Cal HMOs). (Figure 31). At the same time, some physicians in the state appear to be avoiding HMO contracts entirely. Sixteen percent of generalists and 20% of specialists had no HMO patients in their practice in 1998 (Bindman *et al.*, 1998a).

FIGURE 31

Percent of Patients in HMOs: Generalists and Specialists, California 1998***



* Including Medicare and Medi-Cal managed care.
 ** Includes only physicians in urban communities.
 *** Includes physicians in obstetrics-gynecology, family practice, general practice, general internal medicine and general pediatrics.
 Source: Bindman *et al.*, 1998a.

PHYSICIAN PAYMENT AND EARNINGS

In urban California, about half of generalist physicians (54%) and one-third of specialist physicians (32%) reported in 1998 that they were paid on a salaried basis, with the remainder working under non-salaried arrangements. Of the physicians who worked on a non-salaried basis, capitation played a more prominent role in compensation of generalists than of specialists.

About 25% of non-salaried generalists received at least half of their income from capitation. (Figure 32). In contrast, the vast majority (85%) of non-salaried specialists received at least half of their income from fee-for-service payments.

FIGURE 32

Generalists**	0% of Income	1-20% of Income	21-50% of Income	Over 50% of Income
Capitation	26.2%	15.7%	33.4%	24.8%
Fee-for-Service	-	8.9%	26.5%	64.4%
Specialists				
Capitation, Specialty Patients	56.7%	19.5%	16.2%	7.5%
Capitation, Primary Care Patients	86%	9.3%	4.1%	0.1%
Fee-for-Service	1.9%	3.4%	10.1%	84.5%

*Income Structure of Generalist and Specialist Physicians, 1998**

* Includes only physicians in urban communities. Excludes salaried physicians.

** Includes physicians in obstetrics-gynecology, family practice, general practice, general internal medicine and general pediatrics.

Source: Bindman, *et al.*, 1998a.

Financial incentives for physicians in the form of various types of “bonus payments” or “performance-based compensation” are very common among California HMOs and IPAs (Grumbach *et al.*, 1998a; Grumbach *et al.*, 1998b). While some financial incentives are based on clinical outcomes or patient satisfaction, many are designed to limit services such as specialist referrals. In California, almost 40% of primary care physicians with managed care contracts reported that their income was in part based on financial incentives in addition to the basic practice compensation they received (Grumbach *et al.*, 1998b).

An analysis of California physicians’ experiences with financial incentives found that financial incentives based on increasing productivity or reducing rates of referral created “selective pressures” that some physicians (17% regarding limiting referrals, 24% regarding seeing more patients per day, and 39% regarding limiting what information is shared with patients about treatment options) perceived to “compromise” patient care (Grumbach *et al.*, 1998b). Such incentives were associated with dissatisfaction among physicians. Conversely, financial incentives based on patient satisfaction or quality of care were positively associated with job satisfaction among California physicians (Grumbach *et al.*, 1998b). A national study reported a similar relationship between financial incentives and physician satisfaction. Of the 1,500 physicians surveyed in the largest metropolitan areas in the U.S., 15% reported feeling “a moderate of strong incentive” to reduce services.

This was off-set by 15% reporting an incentive to increase services to patients (70% reported neutral incentive) (Hadley *et al.*, 1999).

In 1997, the median net income (after practice expenses but before taxes) for urban California physicians was \$120,001 – \$140,000 for generalists and \$200,001 – \$250,000 for specialists (Bindman *et al.*, 1998a). (Figure 33). These incomes were comparable to those reported for physicians nationwide. The American Medical Association's (AMA) national physician survey for the same year found that the median income by specialty ranged from a low of \$132,000 for general and family practitioners to a high of \$249,000 for cardiologists (Zhang *et al.*, 1999).

FIGURE 33

*Generalists and
Specialists Income
Ranges, California*
1998*

Net Pre-Tax Practice Income After Expenses	Generalists**	Percent of Respondents	Specialists	Percent of Respondents
	\$60,000 or less		9.5%	\$100,000 or less
\$60,001 – 80,000		8.9%	\$100,001 – 150,000	17.0%
\$80,001 – 100,000		10.4%	\$150,001 – 200,000*	21.7%
\$100,001 – 120,000		15.3%	\$200,001 – 250,000	21.0%
\$120,001 – 140,000*		14%	\$250,001 – 300,000	11.5%
\$140,001 – 160,000		9.7%	\$300,001 – 350,000	6.5%
\$160,001 – 180,000		8.4%	\$350,001 – 400,000	2.3%
\$180,001 – 200,000		10.3%	\$400,001 – 450,000	1.5%
Greater than \$200,000		13.2%	Greater than \$450,000	5.5%

* Includes only physicians in urban communities.

** Includes physicians in obstetrics-gynecology, family practice, general practice, general internal medicine and general pediatrics.

Source: Bindman, *et al.*, 1998a.

The popular presupposition that managed care has had an effect on physician income is confirmed to some degree by published studies. In addition to the direct effect health maintenance organizations (HMOs) have on the income of those doctors participating in HMOs, there seems to be an association between managed care market penetration and physician income. A national survey of young physicians found that there was a 7% to 11% lower annual income and 6% to 9% lower compensation per hours worked for physicians in markets with HMO penetration rates twice the national average (Hadley *et al.*, 1999). This study noted the difficulty of assessing the direct effect of managed care on physician income because many of the endogenous conditions

(e.g., high physician to general population ratios, high medical care costs, excess hospital capacity) that foster managed care growth also reduce physician income (Hadley *et al.*, 1999).

There is also evidence that managed care penetration affects primary care and specialist physicians' income differently. A study using national data (Simon *et al.*, 1997; Simon *et al.*, 1998) tracked changes in physician incomes between 1985 and 1993 by medical specialty and found that primary care physicians' incomes increased almost 5% annually in those states with the highest rates of managed care growth compared to an increase of only 1.2% for primary care doctors in those states with low managed care growth. The study also found that this relationship was inverted for radiologists, anesthesiologists, and pathologists. During the same period, income for these specialists increased 4.1% in the lowest quartile of managed care growth areas versus 0.1% in the highest.

The tenor of media and trade publication articles suggest a high level of anxiety among California doctors in a managed care environment where some perceive physicians to be working more and making less (for example, Mangan, 1997). However, Hadley and Mitchell (1997) found a 4% decrease in workload (defined as hours worked per week) under managed care. Additional and more precise information is needed to accurately gauge the merits of the “working more—making less” notion.

From the broader perspective, the income fluctuation physicians have experienced does not threaten medicine's overall status as a relatively lucrative profession. Although managed care may be dampening the rate of increase of physician incomes, especially for specialists, with median incomes ranging from \$120,000 to \$250,000, California physicians continue to do well in a state where the overall mean income for workers was \$33,000 (U.S. Census Bureau, 1999a).

PHYSICIANS' PERCEPTIONS OF MEDICAL PRACTICE IN CALIFORNIA

Practice Satisfaction

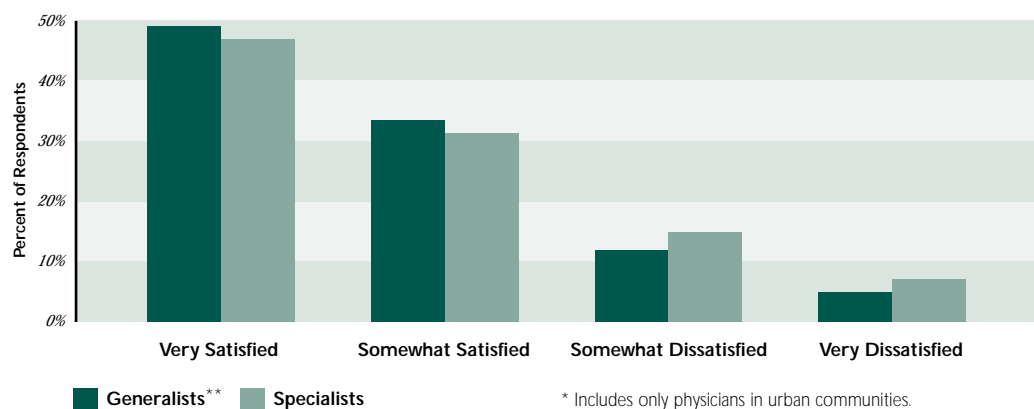
In addition to its potential effects on physician income, managed care is also having a powerful impact on physicians' experience of medical practice. Data from the 1998 California physician survey indicate high rates of satisfaction among most

physicians in the state, although a noteworthy minority is dissatisfied (Bindman *et al.*, 1998a). (Figure 34).

The results from the 1998 UCSF California Physician Survey are consistent with those from another recent California study. A group of Stanford University researchers surveyed California physicians in 1996 and compared these survey results to data from a 1991 survey (Burdi & Baker, 1999). These researchers found that 18% of California physicians in 1996 were “dissatisfied with their main practice situation,” up from 14% dissatisfied in 1991.

FIGURE 34

Satisfaction with Being a Physician, California Generalists and Specialists, 1998*



* Includes only physicians in urban communities.

** Includes physicians in obstetrics-gynecology, family practice, general practice, general internal medicine and general pediatrics.
Source: Bindman *et al.*, 1998a.

Several studies have investigated the degree to which declining physician satisfaction may be attributable to managed care. Most of these studies suggest that working in regions dominated by managed care has an adverse influence on physician satisfaction. For example, a national physician survey conducted in 1995 by Harvard University and Louis Harris and Associates, using a somewhat different question, found that 27% of physicians in high-penetration managed care states (35% or higher) were “dissatisfied with their current practice” compared with only 13% in low-penetration managed care states (11% or lower) (Donelan *et al.*, 1997). This same study found that physicians in states with high HMO penetration were more likely to believe that the overall health care system “got worse” during the prior year.

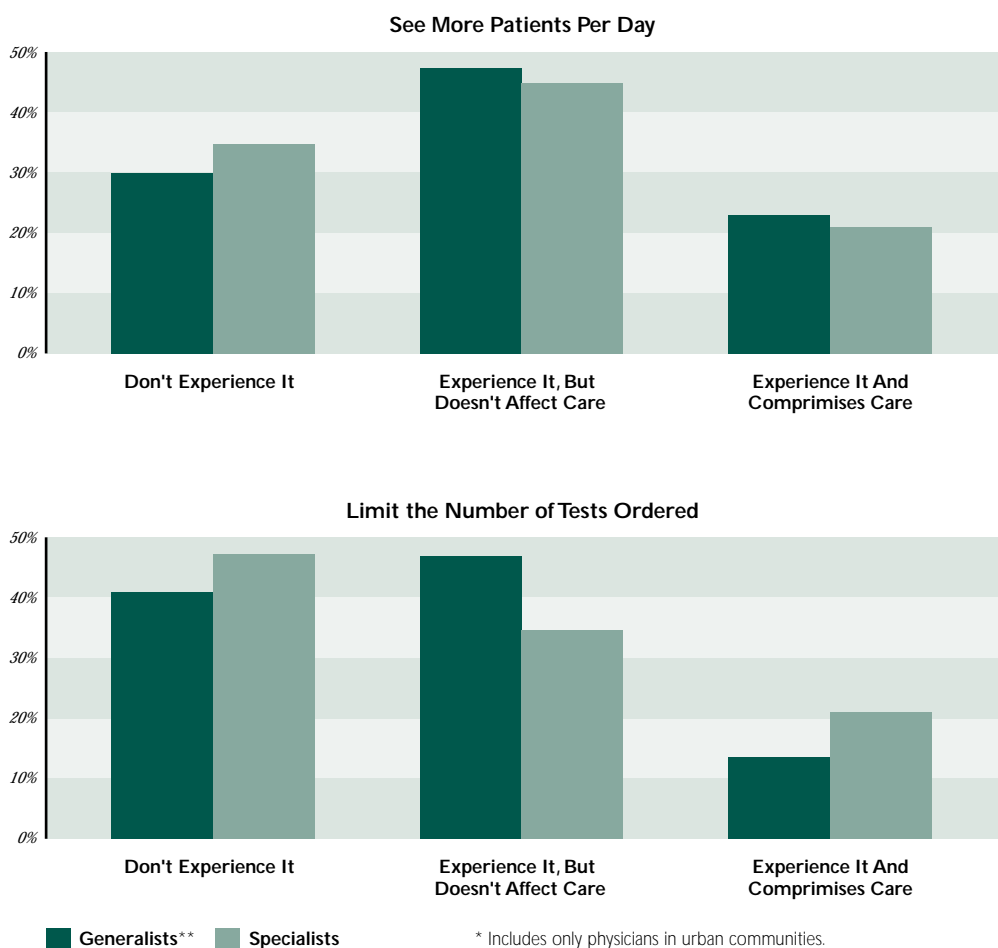
Practice Pressures and Clinical Autonomy

More detailed questions from the 1998 UCSF California physician survey provide insight into the types of practice experiences that fuel physician dissatisfaction. The survey asked physicians whether they felt pressure to practice in a certain way, and whether this pressure compromised patient care. As indicated in Figure 35, a majority of physicians reported pressure to see more patients per day and to limit test ordering. A substantial minority indicated that they believed that these pressures compromised patient care. In contrast, most physicians reported not feeling a need to limit discussion with patients about treatment options.

Discussions of clinical autonomy lie at the center of many investigations into job satisfaction among doctors; an absolute consensus in professional literature is that for physicians a sense of professional autonomy and job satisfaction are virtually inextricable. This conclusion is confirmed by at least a dozen sources (Borowsky *et al.*, 1997; Chesanow, 1997; Hadley & Mitchell, 1997; Hadley *et al.*, 1999; Kerr *et al.*, 1997; Kerr *et al.*, 2000; Mayer, 1999; McMurray

FIGURE 35

Physician Pressures on Care, California 1998 (continued on next page)*

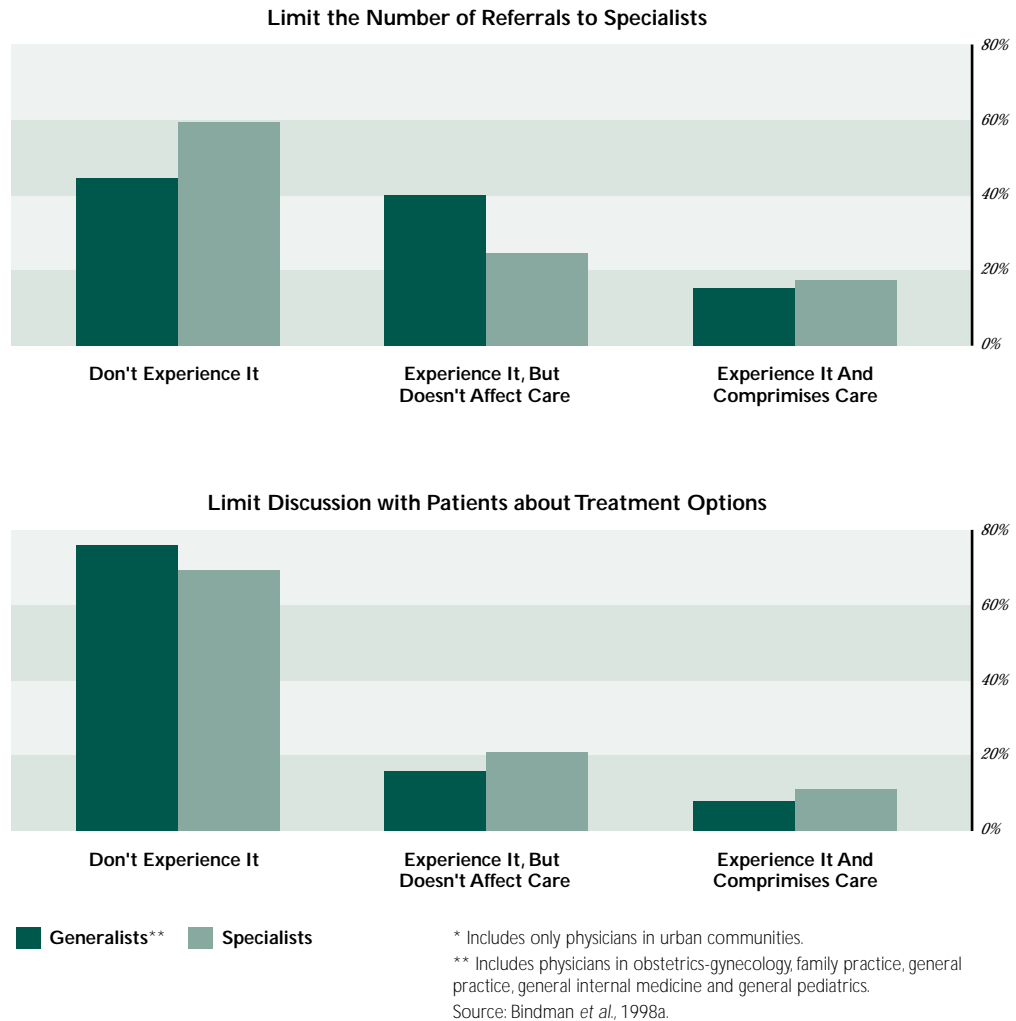


* Includes only physicians in urban communities.

** Includes physicians in obstetrics-gynecology, family practice, general practice, general internal medicine and general pediatrics.

FIGURE 35

Physician Pressures on Care, California 1998 (continued from previous page)*



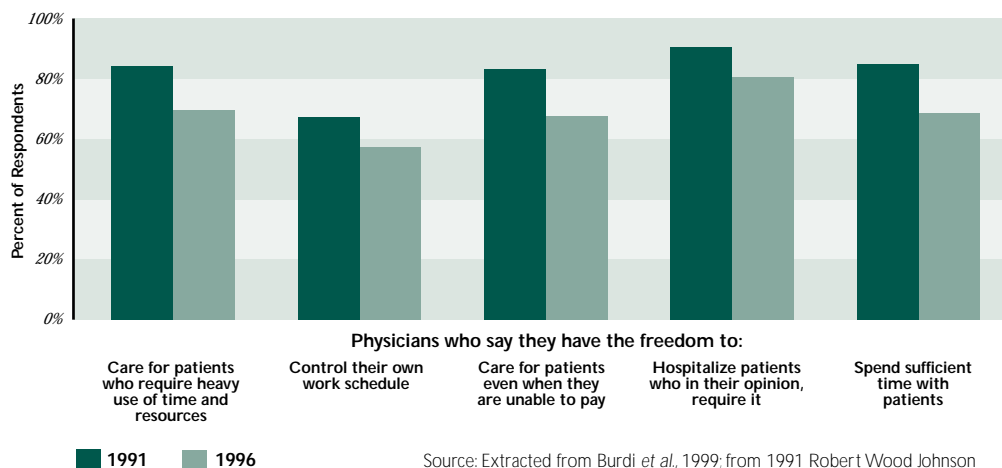
et al., 2000; Simon *et al.*, 1999), all of which list autonomy as either the most significant, or among the most significant predictors of satisfaction among physicians. A recent study found autonomy to be especially important for women in medicine (McMurray *et al.*, 2000).

The Stanford physician survey highlights the types of deterioration in perceived autonomy that some California physicians are experiencing. In analyses comparing young California physicians in 1991 and 1996, this study found substantial decreases in a wide variety of categories of clinical autonomy (Burdi & Baker, 1999). (Figure 36).

In addition to autonomy, other factors have been found to influence physician satisfaction although there is limited information about specific predictors of physician job satisfaction among managed care physicians. A study (McMurray *et al.*, 1997) combining results from a physician survey with focus group data found:

FIGURE 36

*Perceived Autonomy
Among Young
Physicians in 1991
and 1996*



Source: Extracted from Burdi *et al.*, 1999; from 1991 Robert Wood Johnson Foundation Survey of Young Physicians and 1996 Survey of California Physicians.

- Key components of physician satisfaction were the relationships with patients and colleagues and “day-to-day” activities with which the doctors are concerned
- Female physicians stated a proper balance of work and non-work responsibilities was important to their satisfaction with their practices
- Physicians from racial and ethnic minority groups and inner-city physicians cited a “sense of mission” as an important variable in determining practice satisfaction

Satisfaction among Physician Subgroups

Some research has focused on differences in satisfaction between subgroups of physicians. Studies to date on differences between satisfaction rates of primary care practitioners compared to those of specialists have been inconclusive. Although the 1998 UCSF survey found slightly higher rates of satisfaction among primary care physicians than specialists (Figure 34) and a Wisconsin survey found primary care physicians to be significantly more satisfied than subspecialists across most dimensions of satisfaction (Schulz *et al.*, 1997), other studies have found the opposite. For example, a national survey of young (under age 45) physicians found that primary care physicians were more likely than specialists to be less than very satisfied with their practice (Hadley & Mitchell, 1997). In more detailed analysis of the “loss of autonomy” factor, the Stanford physician survey found some notable differences between primary care and specialist physicians.

In the case of freedom to spend sufficient time with patients, the loss of autonomy was felt more acutely by primary care physicians. The decline in freedom to hospitalize patients was much more severe among specialists (Burdi & Baker, 1999).

One national survey of young physicians under age 46 concluded that female and minority physicians were less satisfied with their practices than white male physicians (Baker, 1996). A more recent national study provided some insight into these issues. This study found that female physicians had greater satisfaction than their male counterparts with respect to their relationships with colleagues and patients, and with their chosen specialty. However, female physicians were less satisfied with many aspects of their practice, such as lack of autonomy, pay, relationships with community, and resources (e.g., supplies, exam rooms, staff) (McMurray *et al.*, 2000). A recent survey of minority primary care physicians found lower satisfaction rates for Asian physicians but no significant differences in satisfaction rates among Latino, African American and white physicians (Mackenzie *et al.*, 1999).

The tone of much of the recent literature on physician satisfaction imparts a sense that younger physicians have higher rates of satisfaction with managed care than older physicians (e.g., Baker *et al.*, 1994; Hadley *et al.*, 1999; Burdi & Baker, 1999). It has been proposed that changes in medical education (Hadley *et al.*, 1999) and changing expectations about practice life may explain this difference. However, studies confirm that the factors that determine satisfaction, such as autonomy and income, vary little among doctors (e.g., Baker *et al.*, 1994; Schulz *et al.*, 1997; Kerr *et al.*, 2000).

The cultures and attitudes within U.S. medical schools toward managed care appear to be overwhelmingly negative. A recent survey (Simon *et al.*, 1999) found medical school faculty, administrators, and students to hold poor opinions of managed systems of care. In addition to logistic and ethical concerns about care delivery, complaints about perceived reductions in research time, teaching time and incomes were cited as influencing their attitudes about non-fee-for-service care. Another study suggested, however, that physician satisfaction was higher among those with some exposure to managed care during their education (Hadley *et al.*, 1999).

CARING FOR UNDERSERVED CALIFORNIANS

The significant number of medically underserved Californians includes those without health insurance and those enrolled in Medi-Cal, the state’s Medicaid program. In 1999, one in five Californians were uninsured (U.S. Census Bureau, 1999b). About 5 million people (15% of the total population) were enrolled in Medi-Cal (Medi-Cal Policy Institute, 1999; Medi-Cal Policy Institute, 2000).

It appears that only a minority of California physicians are providing the majority of care to MediCal and uninsured patients. (Figures 37, 38). Over 40% of California physicians do not participate in the Medi-Cal program. At the other end of the spectrum are the 20 – 25% physicians with relatively heavy Medi-Cal case loads (defined as Medi-Cal patients constituting 10% or more of these physicians’ practices);

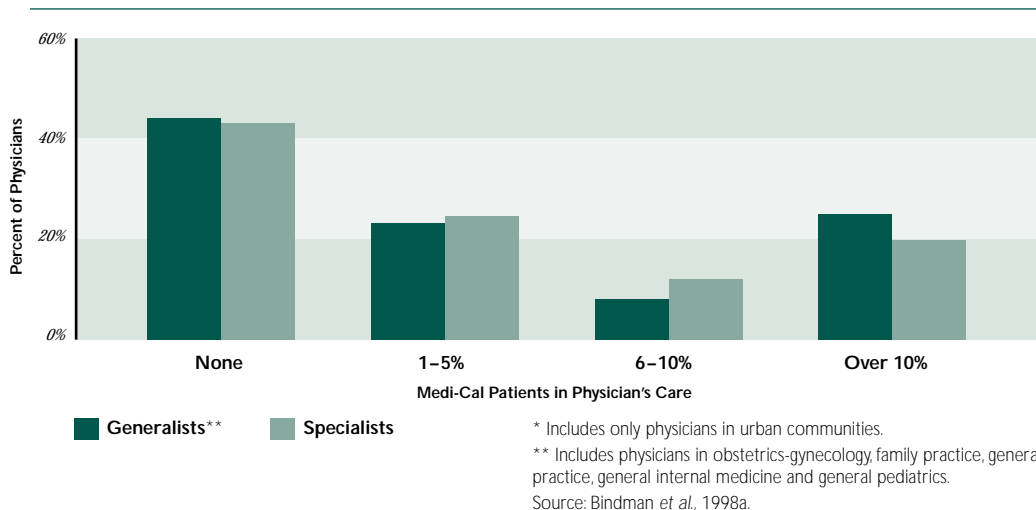


FIGURE 37
*Percent of Patients with Medi-Cal Insurance: California Generalists and Specialists, 1998**

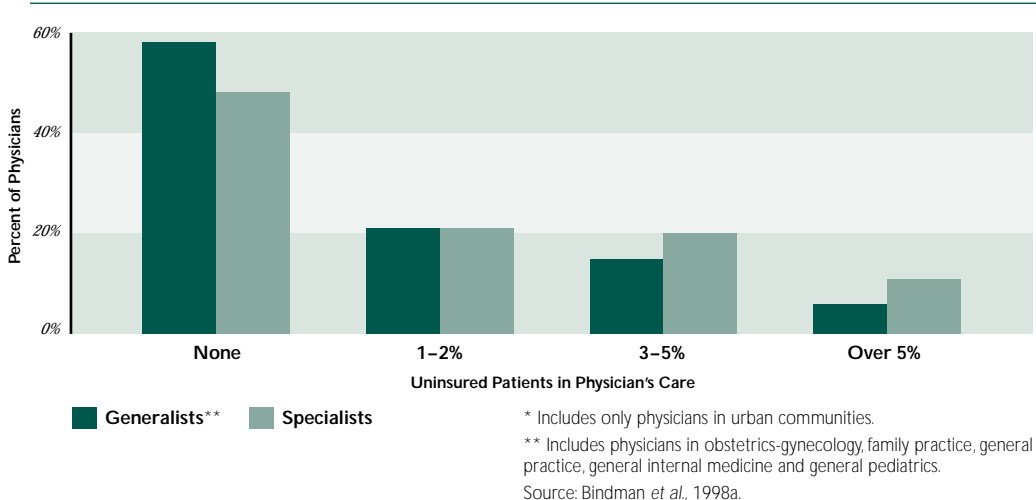


FIGURE 38
*Percent of Patients Uninsured: California Generalists and Specialists, 1998**

many of these physicians in fact have even larger proportions of Medi-Cal patients in their practices. Primary care and specialist physicians have similar patterns of Medi-Cal patient representation in their case loads.

Even more physicians do not have uninsured patients in their practices. Specialists appear to have a greater proportion of uninsured patients in their practices than do generalists. Two factors may explain this finding: The higher incomes of specialists may allow them to accept non-paying patients without compromising their income to the same degree as generalists, and generalists (particularly family physicians and pediatricians) care for children who are less likely to be uninsured than adults.

Some of the recent media reports of possible shortages of specialists in some regions of California (Fernandez, 2000) may in fact have as much to do with problems of lack of physician participation in Medi-Cal as with a lack of sheer numbers of physicians in these areas. In rural regions that have a supply of specialists that may be just within the “adequate” range based on COGME standards, the decision of a few specialists in these regions not to accept Medi-Cal patients may present Medi-Cal patients with few options for specialty care within a convenient distance. Evaluations of problems of access to care in different regions in California need to carefully distinguish the degree to which inadequate physician supply per se is the limiting factor as opposed to problems of health insurance coverage—either due to lack of insurance entirely or to coverage by plans such as Medi-Cal that do not always allow access to “mainstream” medical care.

* CONCLUSION

The data and information contained in this report, drawn from a variety of sources and covering a number of topics, provide a comprehensive sketch of the physician workforce in California at the turn of the 21st century. On some issues the data presented clarify or counter anecdotal information about physicians in the state. For other issues, the data are relatively new and may provoke questions and dialogue rather than provide answers. While some time trends are noted where possible, much of the information should be considered baseline in nature. Ongoing and further research on many of the topics covered in this report is encouraged as necessary to better understand the physician workforce and to make informed policy decisions concerning physicians' education, training and practice arrangements. As part of these efforts to gather and disseminate longitudinal information, the California Workforce Initiative will be conducting a survey of physicians in the state during 2001. For more information, please contact the CWI Program Office.

* APPENDIX A:
PRIMARY DATA SOURCES *and* METHODS

Association of American Medical Colleges (AAMC). (2000). *Selected datafile, October 23, 2000*. Washington DC: AAMC.

Jolly, P., & Hudley, D. M. (Eds.). (1997). *AAMC Data Book: Statistical Information Related to Medical Education* (January 1997 ed.). Washington DC: AAMC.

Two types of data sources from the Association of American Medical Colleges (AAMC) were used in this study. First was the AAMC Data Book (Jolly & Hudley, eds., 1997), a printed record of data series regarding medical training and education. Compiled over eight decades, this book contains information about medical education in the U.S. including demographics, institutions, finances. Second were data downloads specifically compiled for this study by the AAMC research staff in Washington DC. The AAMC staff provided our research team with up-to-date (academic year 2000 – 01) information about characteristics of current students in medical training.

American Medical Association. (2000). *Selected datafile for CA Physicians: Excerpted from AMA Masterfile 2000 Survey data*. Medical Marketing Service, Inc. [July 24, 2000].

American Medical Association. (1997). *Selected datafile for CA Physicians: Excerpted from AMA Masterfile 1996 Survey data*. Medical Marketing Service, Inc.

American Medical Association. (1994). *Selected datafile for CA Physicians: Excerpted from AMA Masterfile 1993 Survey data*. Medical Marketing Service, Inc.

The American Medical Association (AMA) Physician Masterfile includes current and historical data on all physicians meeting U.S. credentialing requirements. The Masterfile data are derived from many sources including: undergraduate medical education data from 125 LCME-accredited medical schools; 7,900 ACGME-accredited graduate medical education programs and 1,600 teaching institutions; 811,000 physicians; and 20,000 medical group practices. The AMA monitors and updates the database used to compile the Masterfile on a continual basis. Therefore, data downloaded on a specific date may differ slightly from data obtained on a different date of the same survey

year. The Masterfile obtained by this research team excluded inactive physicians in CA (physicians working less than 20 hours per week, retired physicians, physicians working outside medical fields, etc.), and was sorted as noted in the text to evaluate characteristics of physicians in the state having patient care as their primary occupation.

American Medical Association. (1998). *Selected data from the Graduate Medical Education Database*. Chicago IL: AMA.

The American Medical Association, Division of Graduate Medical Education maintains a database updated continually describing the characteristics of the accredited and combined specialty programs in the United States (and approved programs abroad). The 1998 California data used for this study included 667 accredited programs. Data were obtained from 651 of these (97.6%). The selected data included information about all active residents in graduate medical education programs in California for the 1998–1999 academic year, including students who graduated from foreign medical schools before moving to California for further training. Analysis and presentation of these data reflects the entire database of residents unless otherwise noted in the text.

Bindman, A., Grumbach, K., Osmond, D., Vranizan, K., Jaffe, D., Fernandez, A., Goiten, L. (1998a). *UCSF California Physician Survey* (unpublished data; previously published articles using these data listed below). San Francisco: Primary Care Research Center.

This survey of California generalists and specialists was conducted using self-administered questionnaires. The survey sampled physicians practicing in the 13 largest urban counties in California (Alameda, Contra Costa, Fresno, Los Angeles, Orange, Riverside, San Bernardino, San Diego, Sacramento, San Francisco, Solano, San Mateo and Santa Clara). The study counties contain 80% of the states physicians and general population. Physicians selected from the 1997 AMA Masterfile for participation were active, non-federal, and non-trainee direct patient-care physicians in these counties.

Specialists were sampled who listed their primary specialty as cardiology, endocrinology, gastroenterology, general surgery, neurology, ophthalmology, or orthopedics. These specialties were chosen to provide a broad spectrum (procedure and non-procedure oriented) of both surgical and medical office-based subspecialties.

Specialist physicians were selected using a probability sample stratified by county and by physician race/ethnicity with an oversampling of non-white physicians. Completed questionnaires were obtained from 978 of the 1,492 eligible specialist physicians (66%).

Primary care physicians were surveyed in 1998 as part of a related research project. The primary care physicians were initially selected and surveyed in 1996. Details of the sample are given in a previous report (Bindman *et al.*, 1998b). Similar to the specialist survey, primary care physicians were drawn using a probability sample stratified by the 13 counties and by physician race/ethnicity with an oversampling of non-White physicians. Primary care physicians were sampled who listed their primary specialty as family practice, general practice, general internal medicine, general pediatrics or obstetrics/gynecology. In the original 1996 sample, completed responses were obtained from 947 of 1,336 eligible primary care physicians (71%). Between 1996 and 1998, 71 primary care physicians became ineligible due to death, retirement, or moving out of the study area. In the 1998 survey wave, completed questionnaires were obtained from 713 of the 876 eligible primary care physicians (81%).

All survey data published in this report are weighted to be representative of the population of physicians in the sampled specialties practicing in the 13 study counties.

Related published articles using these data:

Bindman, A., Grumbach, K., Vranizan, K., Jaffe, D., & Osmond, D. (1998b). Selection and exclusion of primary care physicians by managed care organizations. *Journal of the American Medical Association*, 279(9), 675-679.

Fernandez, A., Grumbach, K., Goitein, L., Vranizan, K., Osmond, D., Bindman, A. (2000). Friend or Foe: How primary care physicians perceive hospitalists. *Archives of Internal Medicine*, 160, 2902-2908.

Grumbach, K., Osmond, D., Vranizan, K., Jaffe, D., Bindman, A. (1998b). Primary care physicians' experience of financial incentives in managed-care systems. *New England Journal of Medicine*, 339(21), 1516-1521.

Pasko, T., Seidman, B., Birkhead, S., & American Medical Association. (2000). *Physician Characteristics and Distribution in the U.S.: 2000–2001 Edition*. Chicago IL: American Medical Association.

Each year, the American Medical Association issues the Physician Characteristics and Distribution (PCD) report of compiled data on numerous aspects of the physician workforce and physician practice in the United States and specified territories and possessions. Based on data gathered for the 1998–99 AMA Masterfile, the published data book contains detailed data tables for physician characteristics, professional activities by specialty and geographic region, analyses of primary care specialty trends and characteristics, overall physician trends, and ratios and projections for physician supply across the United States, and in some cases for individual states.

State of California Department of Finance. (2000). *Historical City/County Population Estimates, 1991 – 2000 with 1990 Census Counts*. Sacramento CA: State of California, Department of Finance; Available: www.dof.ca.gov/HTML/DEMOGRAP/HistE-4.htm.

This data report was compiled by staff of the Demographic Research Unit of the CA Department of Finance. The report provides provisional population estimates for the state, counties, and cities for January 1, 2000 and revised estimates for January 1, 1991 through January 1 1999. It also includes 1990 decennial census counts. The estimates benchmark used was April 1, 1990, where city and county population estimates were independently adjusted so that adjusted county data were compiled to estimate state population. Changes in industry and military activities in California during this time were included in the estimation of population changes. Births, deaths, and other vital statistics information were tracked through numerous methods, including traceable changes in tax filing, immigration status, enrollment in public assistance programs, etc. Data from state and county offices, the U.S. Department of the Census, and other federal agencies were used by the Demographic Research Unit as well. Individual counts in the estimations may not sum to totals due to rounding; populations were rounded up or down systematically depending on the ranges being evaluated for the different presentations of data.

* APPENDIX B:
PHYSICIAN SPECIALTIES *by* CATEGORY

Facility-based Specialties

Anatomic Pathology
Anatomic and Clinical Pathology
Anesthesiology
Blood Banking/Transfusion
Chemical Pathology
Clinical Pathology
Critical Care (Anesthesiology)
Cytopathology
Dermatopathology
Diagnostic Radiology
Forensic Pathology
Hematology (Pathology)
Immunopathology
Medical Microbiology
Neuropathology
Neuroradiology
Nuclear Radiology
Pain Management (Anesthesiology)
Pediatric Pathology
Pediatric Radiology
Radiology
Selective Pathology
Vascular & Intervention Radiology

Generalist Specialties

Family Practice
General Practice
Internal Medicine
Pediatrics
Sports Medicine (Family Practice)
Geriatric Medicine (Family Practice)
Internal Medicine (Pediatrics)

General Surgery

Abdominal Surgery
General Surgery

Medical Subspecialties

Adolescent Medicine
Allergy
Allergy & Immunology
Cardiovascular Disease
Clinical & Lab Immunology
Clinical Cardiac Electrophysiology
Clinical Genetics
Critical Care Medicine
Diabetes
Endocrinology, Metabolism
Gastroenterology
Geriatric Medicine (Internal Medicine)
Hematology (Internal Medicine)
Hematology - Oncology
Hepatology
Immunology
Infectious Disease
Medical Genetics
Medical Oncology
Neonatal/Perinatal Medicine
Nephrology
Nutrition
Pediatric Allergy
Pediatric Cardiology
Pediatric Critical Care Medicine
Pediatric Endocrinology
Pediatric Gastroenterology
Pediatric Hematology/Oncology

(continued on next page)

Pediatric Nephrology

Pediatric Pulmonology

Pediatric Rheumatology

Pulmonary Disease

Rheumatology

Obstetrics/Gynecology

Gynecological Oncology

Gynecology

Maternal and Fetal Medicine

Obstetrics

Obstetrics/Gynecology

Reproductive Endocrinology

Other Specialties

Addiction Medicine

Aerospace Medicine

Child Neurology

Clinical Pharmacology

Dermatology

Emergency Medicine

General Preventive Medicine

Legal Medicine

Neurology

Nuclear Medicine

Occupational Medicine

Pain Medicine

Pediatric Emergency Medicine

Physical Medicine & Rehabilitation

Public Health & Preventive Medicine

Radiation Oncology

Sports Medicine (Emergency Medicine)

Psychiatric Specialties

Addiction Psychology

Child & Adolescent Psychiatry

Geriatric Psychiatry

Psychiatry - General

Psychoanalysis

Surgical Subspecialties

Adult Reconstruction Orthopedics

Cardiovascular Surgery

Colon and Rectal Surgery

Facial Plastic Surgery

General Vascular Surgery

Hand Surgery (Orthopaedic Surgery)

Hand Surgery (Plastic Surgery)

Hand Surgery (Surgery)

Head and Neck Surgery

Musculoskeletal Oncology

Neurological Surgery

Ophthalmology

Orthopaedic Surgery

Orthopaedic Surgery of the Spine

Orthopaedic Trauma

Otolaryngology

Otology

Pediatric Ophthalmology

Pediatric Orthopedics

Pediatric Otolaryngology

Pediatric Surgery (Neurology)

Pediatric Surgery (Surgery)

Pediatric Urology

Plastic Surgery

Sports Medicine (Orthopedic Surgery)

Surgical Critical Care (Surgery)

Thoracic Surgery

Traumatic Surgery

Urology

★ APPENDIX C:
CALIFORNIA ACTIVE, PATIENT-CARE PHYSICIANS BY
SPECIALTY CHOICE *and* RACE/ETHNICITY, 2000*

	Generalists	OB, GYN Specialties	Medical Subspecialties	Facility-based Specialties	General Surgery Specialties	Surgical Specialties	Psychiatric Specialties	Other Specialties	Unspecified Specialties	Totals
Asian/Pacific Islander	3,958	564	1,183	1,273	267	747	405	431	24	8,852
Black, Non-Hispanic	458	157	114	179	49	160	90	81	3	1,291
Native American/AK Native	16	3	1	5	3	2	2	2	0	34
White, Non-Hispanic	9,452	1,966	3,601	5,248	1,058	5,022	2,764	2,016	32	31,159
Hispanic										
Mexican American	80	5	3	13	3	2	6	2	0	114
Other Hispanic	816	151	176	185	76	141	117	59	1	1,722
Puerto Rican	2	1	0	2	0	0	0	0	0	5
Other	566	67	219	178	44	139	88	73	4	1,378
Unknown	135	7	7	10	5	16	0	8	5	193
No Data	7,654	1,138	1,908	3,704	784	2,247	1,398	1,048	469	20,350
Total	23,137	4,059	7,212	10,797	2,289	8,476	4,870	3,720	538	65,098

*n=65,098: Active patient care physicians with Major Professional Activity of office-based (including locum tenens) and hospital staff; excludes residents, federal physicians, non-classified MPA, "other" MPA, inactive physicians and physicians with MPA in non-patient care activities.

** See Appendix B for list of specialty categories.

Source: AMA Masterfile, 2000



APPENDIX D:
GROUPING *of* CALIFORNIA COUNTIES BY REGION

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

* APPENDIX E:
 CALIFORNIA ACTIVE PATIENT-CARE PHYSICIANS*
and RATIOS TO POPULATION, BY REGION,** 2000

	Population	Number of Generalists***	Ratio of Generalists : 100,000 Population	Number of Specialists****	Ratio of Specialists : 100,000 Population	Number of Patient Care Physicians	Ratio of Patient Care Physicians: 100,000 Population
Bay Area	7,133,200	5,929	83	11,014	154	16,943	238
Central Coast	1,865,000	1,224	66	2,181	117	3,405	183
Central Valley/Sierra	1,135,090	637	56	881	78	1,518	134
Inland Empire	3,241,300	1,566	48	2,558	79	4,124	127
Los Angeles	9,884,300	6,537	66	12,571	127	19,108	193
North Counties	893,300	609	68	856	96	1,465	164
North Valley/Sierra	1,992,540	1,356	68	2,377	119	3,733	187
Orange	2,828,400	2,032	72	3,693	131	5,725	202
San Diego	3,056,800	1,859	61	3,682	120	5,541	181
South Valley/Sierra	2,306,450	1,141	49	1,628	71	2,769	120
Missing Data	-	247	-	520	-	767	-
Totals	34,336,380	23,137	67	41,961	122	65,098	190

* n=65,098; Active patient care physicians with Major Professional Activity of office-based (including locum tenens) and hospital staff; excludes residents, federal physicians, non-classified MPA, "other" MPA, inactive physicians and physicians with MPA in non-patient care activities.

** See Appendix D for list of counties within each geographic region.

*** Family practice, general practice, internal medicine and pediatrics (AMA codes FP, IM, PD, GP, FSM, FPG, MPD).

**** Non-generalists, including unspecified specialty designations.

Sources: AMA Masterfile, 2000; CA Department of Finance, May 2000.



APPENDIX F:
 CALIFORNIA ACTIVE PATIENT-CARE PHYSICIANS
 (TOTALS,* GENERALISTS,** SPECIALISTS,**) *and*
 RATIOS TO 100,000 POPULATION, BY COUNTY, 2000

	Population 2000	Number of Patient Care Physicians	Ratio of Patient Care Physicians: 100,000 Population	Number of Primary Care Physicians	Ratio of Primary Care Physicians: 100,000 Population	Number of Specialists	Ratio of Specialists : 100,000 Population
Alameda	1,454,300	2,973	204	1,143	79	1,830	126
Alpine	1,190	0	0	0	0	0	0
Amador	34,400	50	145	28	81	22	64
Butte	204,000	364	178	129	63	235	115
Calaveras	38,500	28	73	16	42	12	31
Coluas	18,750	14	75	9	48	5	27
Contra Costa	930,000	1,931	208	683	73	1,248	134
Del Norte	28,000	44	157	22	79	22	79
El Dorado	152,900	204	133	83	54	121	79
Fresno	805,000	1,193	148	468	58	725	90
Glenn	27,100	10	37	5	18	5	18
Humboldt	127,600	263	206	102	80	161	126
Imperial	145,300	100	69	32	22	68	47
Inyo	18,200	34	187	17	93	17	93
Kern	658,900	778	118	307	47	471	71
Kings	131,200	95	72	50	38	45	34
Lake	55,700	62	111	33	59	29	52
Lassen	33,950	25	74	15	44	10	29
Los Angeles	9,884,300	19,108	193	6,537	66	12,571	127
Madera	117,100	95	81	44	38	51	44
Marin	249,700	904	362	265	106	639	256
Mariposa	16,150	9	56	5	31	4	25
Mendocino	87,600	173	197	79	90	94	107
Merced	210,100	200	95	98	47	102	49
Modoc	9,800	5	51	3	31	2	20
Mono	10,900	22	202	6	55	16	147
Monterey	399,300	618	155	221	55	397	99
Napa	127,000	320	252	108	85	212	167
Nevada	91,100	180	198	68	75	112	123
Orange	2,828,400	5,725	202	2,032	72	3,693	131
Placer	234,400	493	210	221	94	272	116
Plumas	20,350	26	128	17	84	9	44
Riverside	1,522,900	1,828	120	700	46	1,128	74
Sacramento	1,209,500	2,304	190	751	62	1,553	128
San Benito	49,800	38	76	20	40	18	36
San Bernardino	1,689,300	2,240	133	843	50	1,397	83
San Diego	2,911,500	5,441	187	1,827	63	3,614	124
San Francisco	801,400	3,278	409	1,063	133	2,215	276
San Joaquin	566,600	730	129	302	53	428	76
San Luis Obispo	245,200	527	215	179	73	348	142
San Mateo	730,000	2,426	332	666	91	1,760	241
Santa Barbara	414,200	890	215	305	74	585	141

continued on next page

	Population 2000	Number of Patient Care Physicians	Ratio of Patient Care Physicians: 100,000 Population	Number of Primary Care Physicians	Ratio of Primary Care Physicians: 100,000 Population	Number of Specialists	Ratio of Specialists : 100,000 Population
Santa Clara	1,736,700	3,027	174	1,171	67	1,856	107
Santa Cruz	255,000	516	202	195	76	321	126
Shasta	167,000	351	210	121	72	230	138
Sierra	3,140	2	64	1	32	1	32
Siskiyou	44,200	65	147	37	84	28	63
Solano	399,000	583	146	241	60	342	86
Sonoma	450,100	985	219	394	88	591	131
Stanislaus	441,400	612	139	251	57	361	82
Sutter	77,900	133	171	61	78	72	92
Tehama	56,200	55	98	30	53	25	44
Trinity	13,050	8	61	7	54	1	8
Tulare	368,000	399	108	169	46	230	63
Tuolumne	53,000	98	185	40	75	58	109
Ventura	756,500	1,332	176	499	66	833	110
Yolo	162,900	333	204	133	82	200	123
Yuba	60,700	84	138	38	63	46	76
Missing Data	-	767	-	247	-	520	-
Total State	34,336,380	65,098	190	23,137	67	41,961	122

* n=65,098: Active patient care physicians with Major Professional Activity of office-based (including locum tenens) and hospital staff; excludes residents, federal physicians, non-classified MPA, "other" MPA, inactive physicians and physicians with MPA in non-patient care activities.

** Family practice, general practice, internal medicine and pediatrics (AMA codes FP, IM, PD, GP, FSM, FPG, MPD).

*** Non-generalists, including unspecified specialty designations.

Sources: AMA Masterfile, 2000; CA Department of Finance, May 2000.

* REFERENCES

Ainsworth, B. (2000, July 8). Feinstein sees state health care catastrophe, proposes solutions. *San Diego Union-Tribune*, A-5.

Association of American Medical Colleges (AAMC). (2000). Selected datafile, October 23, 2000. Washington DC: AAMC.

American Medical Association. (1994). Selected datafile for CA Physicians: Excerpted from AMA Masterfile Survey data. Medical Marketing Service, Inc.

American Medical Association. (1997). Selected datafile for CA Physicians: Excerpted from AMA Masterfile Survey data. Medical Marketing Service, Inc.

American Medical Association. (1998). Selected data from the Graduate Medical Education Database. Chicago IL: AMA.

American Medical Association. (July 24, 2000). Selected datafile for CA Physicians: Excerpted from AMA Masterfile Survey data. Medical Marketing Service, Inc.

Baker, L., Cantor, J., Miles, E., & Sandy, L. (1994). What makes young HMO physicians satisfied? *HMO Practice*, 8(2), 53 – 57.

Baker, L. (1996). Differences in earnings between male and female physicians. *New England Journal of Medicine*, 334(15), 960 – 964.

Bartlett, B. (2000). U. S. spending on prescription drugs. Washington DC: National Center for Policy Analysis.

Bindman, A., Grumbach, K., Osmond, D., Vranizan, K., Jaffe, D., Fernandez, A., & Goitein, L. (1998a). UCSF California physicians survey (unpublished data; previously published articles using these data listed in Appendix A). San Francisco: Primary Care Research Center.

Bindman, A., Grumbach, K., Vranizan, K., Jaffe, D., & Osmond, D. (1998b). Selection and exclusion of primary care physicians by managed care organizations. *Journal of the American Medical Association*, 279(9), 675 – 679.

Borowsky, S., Davis, M., Goertz, C., & Lurie, N. (1997). Are all health plans created equal? The physician's view. *Journal of the American Medical Association*, *278*(11), 917 – 921.

Burdi, M., & Baker, L. (1999). Physicians' perceptions of autonomy and satisfaction in California. *Health Affairs*, *18*(4), 134 – 144.

Cantor, J., Miles, E., Baker, L., & Barker, D. (1996). Physician service to the underserved: Implications for affirmative action in medical education. *Inquiry*, *33*(2), 167 – 180.

Capitation Management Report (2000). Against all odds, how a large IPA succeeds at capitation: Hill Physicians makes risk contracting work. *Capitation Management Report*, *7*(10), 145 – 160.

Chesanow, N. (1997, November 24). How doctors spend their working hours. *Medical Economics*, 116 – 125, 130.

Council on Graduate Medical Education. (1996). *Eighth Report: Patient care physician supply and requirements: Testing COGME recommendations* (Eighth Report). Rockville MD: Council on Graduate Medical Education.

Council on Graduate Medical Education. (1994). *Fourth Report: Recommendations to Improve Access to Health Care Through Physician Workforce Reform* (Fourth Report). Rockville, MD: Council on Graduate Medical Education.

Council on Graduate Medical Education. (1995). *Fifth Report: Women & Medicine* (Fifth Report). Rockville, MD: Council on Graduate Medical Education.

Donelan, K., Blendon, R., Lundberg, G., Calkins, D., Newhouse, J., Leape, L., Remler, D., & Taylor, H. (1997). The new medical marketplace: Physicians' views. *Health Affairs*, *5*, 139 – 148.

Dower, C., Berkowitz, G., Grumbach, K., & Wong, C. (1999). *From affirmative action to health: A critical appraisal of the literature regarding the impact of affirmative action*. San Francisco: UCSF Center for the Health Professions; UCSF Institute for Health Policy Studies.

Escarce, J., Polsky, D., Wozniak, G., & Kletke, P. (2000). HMO growth and the geographical redistribution of generalist and specialist physicians, 1987-1997. *Health Services Research*, *35*(4), 825 – 848.

- Escarce, J., Polsky, D., Wozniak, G., Pauly, M., & Kletke, P. (1998). Health maintenance organization penetration and the practice location choices of new physicians: A study of large metropolitan areas in the United States. *Medical Care, 36(11)*, 1555 – 1566.
- Fernandez, E. (2000, December 17). A gift of health surgeons' mission of mercy eases children's suffering. *San Francisco Chronicle*, A-21.
- Grumbach, K., Coffman, J., Vranizan, K., Blick, N., & O'Neil, E. (1998a). Independent practice associations: Physician groups in California. *Health Affairs, 17(3)*, 227 – 237.
- Grumbach, K., Osmond, D., Vranizan, K., Jaffe, D., Bindman, A. (1998b). Primary care physicians' experience of financial incentives in managed-care systems. *New England Journal of Medicine, 339(21)*, 1516 – 1521.
- Grumbach, K., Mertz, E., & Coffman, J. (1999). *Underrepresented minorities and medical education in California: Recent trends in declining admissions*. San Francisco: Center for California Health Workforce Studies.
- Hadley, J., & Mitchell, J. (1997). Effects of HMO market penetration on physicians' work effort and satisfaction. *Health Affairs, 16(6)*, 99 – 111.
- Hadley J., & Mitchell, J. (1999). HMO penetration and physicians' earnings. *Medical Care, 37(11)*, 1116 – 1127.
- Hadley, J., Mitchell, J., Sulmasy, D., & Bloche, M. (1999). Perceived financial incentives, HMO market penetration, and physicians' practice styles and satisfaction. *Health Services Research, 34(1)*, 307 – 321.
- Heimoff, S. (1999) Up-Hill climb: IPA must step carefully for continued success. *Modern Physician Magazine*. September, 1999
- InterStudy. (2000). The InterStudy Competitive Edge 10.2, Part II: *HMO Industry Report*. St. Paul, MN: InterStudy Publications.
- Jaklevic, M. (1999). An IPA success story: Hill Physicians Medical Group bucks a downward trend in California by embracing managed care. *Modern Health Care*. September 13, 1999
- Jolly, P., & Hudley, D. (Eds.). (1997). *AAMC data book: Statistical information related to medical education* (January 1997 ed.). Washington DC: AAMC.

- Journal of the American Medical Association. (1971). Annual medical education issue. *Journal of the American Medical Association, 218(8)*, 1217 – 1251.
- Journal of the American Medical Association. (1976). Annual medical education issue. *Journal of the American Medical Association, 236(26)*, 2962 – 2978.
- Journal of the American Medical Association. (1981). Annual medical education issue. *Journal of the American Medical Association, 246(25)*, 2913 – 2977.
- Journal of the American Medical Association. (1985). Annual medical education issue. *Journal of the American Medical Association, 254(12)*, 1585 – 1629.
- Journal of the American Medical Association. (1991). Annual medical education issue. *Journal of the American Medical Association, 266(7)*, 1007 – 1018.
- Journal of the American Medical Association. (1996). Annual medical education issue. *Journal of the American Medical Association, 276(9)*, 735 – 748.
- Journal of the American Medical Association. (1997). Annual medical education issue. *Journal of the American Medical Association, 278(9)*, 770 – 784.
- Journal of the American Medical Association. (1998). Annual medical education issue. *Journal of the American Medical Association, 280(9)*, 832 – 845.
- Journal of the American Medical Association. (1999). Annual medical education issue. *Journal of the American Medical Association, 282(9)*, 888 – 906.
- Journal of the American Medical Association. (2000). Annual medical education issue. *Journal of the American Medical Association, 284(9)*, 1149 – 1172.
- Keith, S., Bell, R., Swanson, A., & Williams, A. (1985). Effects of affirmative action in medical schools—A study of the Class of 1975. *New England Journal of Medicine, 313(24)*, 1519 – 1525.
- Kerr, E., Hays, R., Mittman, B., Siu, A., Leake, B., & Brook, R. (1997). Primary care physicians' satisfaction with quality of care in California capitated medical groups. *Journal of the American Medical Association, 278(4)*, 308 – 312.
- Kerr, E., Mittman, B., Hays, R., Zemencuk, J., Pitts, J., & Brook, R. (2000). Associations between primary care physician satisfaction and self-reported aspects of utilization management. *Health Services Research, 35(1)*, 333 – 349.

- Komaromy, M., Grumbach, K., Drake, M., Vranzian, K., Lurie, N., Keane, D., & Bindman, A. (1996). The role of Black and Hispanic physicians in providing health care for underserved populations. *New England Journal of Medicine*, *334*(20), 1305 – 1310.
- Mackenzie, E., Taylor, L., Lavizzo-Mourey, R. (1999). Experiences of ethnic minority primary care physicians with managed care: A national survey. *The American Journal of Managed Care*, *5*(10), 1251 – 1264.
- Mangan, D. (1997, September 8). One doctor's life: Working harder, making less. *Medical Economics*, 320 – 238.
- Mayer, T. (1999). Regaining control of your practice: Physician empowerment through active 'followership'. *Postgraduate Medicine*, *106*(2), 15 – 18.
- McMurray, J., Williams, E., Schwartz, M., Douglas, J., Van Kirk, J., Konrad, R., Gerrity, M., Bigby, J., Linzer, M. (1997). Physician job satisfaction: Developing a model using qualitative data. *Journal of General Internal Medicine*, *12*(11), 711 – 14.
- McMurray, J., Linzer, M., Konrad, T., Douglas, J., Shugerman, R., Nelson, K. (2000). The work lives of women physicians: Results from the Physician Work Life Study. *Journal of General Internal Medicine*, *15*, 372 – 380.
- Mechanic, D., & Rosenthal, M. (1999). Responses of HMO medical directors to trust building in managed care. *The Milbank Quarterly*, *77*(3), 283 – 303.
- Medi-Cal Policy Institute. (1999). *Medi-Cal county data book* (July ed.). Oakland CA: Medi-Cal Policy Institute.
- Medi-Cal Policy Institute. (2000). County-by-County data-statewide overview; as of 1/26/00, [website]. Medi-Cal Policy Institute.
Available: www.medi-cal.org/countydata/index.cfm
- Moy, E., & Bartman, B. (1995). Physician race and care of minority and medically indigent patients. *Journal of the American Medical Association*, *273*(19), 1515 – 1520.
- Office of Statewide Health Planning and Development (OSHPD). (2000). List of designated primary medical care Health Professional Shortage Areas (HPSAs): Designations as of June 30, 2000 . Sacramento CA: OSHPD.

Parrish, M. (2000, January 24). The California nightmare: Is this where managed care is taking us? *Medical Economics*, 48 – 64.

Pasko, T., Seidman, B., Birkhead, S., & American Medical Association. (2000). *Physician characteristics and distribution in the US: 2000–2001 edition*. Chicago IL: American Medical Association.

Robinson, J. (1999). *The corporate practice of medicine: Competition and innovation in health care*. Berkeley CA: University of California Press.

Schmittziel, J., & Grumbach, K. (1999, October 14). *Women in medicine in the United States: Progress and challenges on the road to gender parity*. Paper presented at the Fourth International Medical Workforce Conference, San Francisco CA.

Schulz, R., Scheckler, W., Moberg, D., Johnson, P. (1997). Changing nature of physician satisfaction with health maintenance organization and fee-for-service practices. *The Journal of Family Practice*, 45(4), 321 – 330.

Simon, C., Dranove, D., & White, W. (1997). The impact of managed care on the physician marketplace. *Public Health Reports*, 112(May-June), 222 – 230.

Simon, C., Dranove, D., & White, W. (1998). The effect of managed care on the incomes of primary care and specialty physicians. *Health Services Research*, 33(3), 549 – 569.

Simon, S., Pan, R., Sullivan, A., Clark-Chiarelli, N., Connelly, M., Peters, A., Singer, J., Inui, T., & Block, S. (1999). A survey of students, residents, faculty, and deans at medical schools in the United States. *New England Journal of Medicine*, 340(12), 928 – 935.

Starfield, B. (1992). *Primary care: Concept, evaluation, and policy*. New York: Oxford University Press.

State of California Department of Finance. (2000). *Historical city/county population estimates, 1991 – 2000 with 1990 Census counts*. Sacramento CA: State of California, Department of Finance. Available: www.dof.ca.gov/HTML/DEMOGRAP/HistE-4.htm

U.S. Census Bureau. (1999a). *Statistical abstract of the United States: The national data book* (CD-rom). Washington DC: U.S. Census Bureau.

U.S. Census Bureau. (1999b). *Table E: Percent of people without health insurance coverage throughout the year by state (3-year average): 1997 to 1999*. Housing and Household Economic Statistics Division, U.S. Census Bureau.

Available: www.census.gov/hhes/hlthins/lowinckid.html

University of California Office of the President. (1994). Memorandum of understanding between the University of California and the Office of Statewide Health Planning and Development, State of California Health and Welfare Agency (reprinted in *Changing directions in medical education: Second report*). Oakland CA: University of California Office of the President.

Xu, G., Fields, S., Laine, C., Veloski, J., Barzansky, B., & Martini, C. (1997). The relationship between the race/ethnicity of generalist physicians and their care for underserved populations. *American Journal of Public Health, 87*(5), 817 – 822.

Zhang, P., Thran, S., & American Medical Association (Eds.). (1999). *Physician socioeconomic statistics, 1999 – 2000 edition*. Chicago IL: American Medical Association.