

The Growing Challenge Of Providing Oral Health Care Services To All Americans

The current practice model of dentistry, which serves insured patients and those who can pay out of pocket, must be changed to include the rest of the population.

by **Elizabeth Mertz and Edward O'Neil**

PROLOGUE: Frustrations over the difficulty of improving health care in the United States often reflect a sense that the system's overwhelming complexity is our worst enemy. In the following overview of the state of the nation's oral health, it is apparent that even in a relatively simple subdomain of the health enterprise, our cherished preference for harnessing private institutions to the pursuit of public goals brings success only at the price of endless tensions and trade-offs.

Elizabeth Mertz and Edward O'Neil find that better preventive care and patient habits have helped improve oral health "for many parts of the population." At the same time, the number of dental hygienists in the workforce has grown steadily and is expected to increase by 37 percent between 2000 and 2010. But the U.S. dentist-to-population ratio declined during the 1990s, and the amount of time that dentists spend with patients every week has also been declining—partly a result of the increasing use of hygienists.

This apparent signal of market equilibrium is misleading. The authors find "abundant evidence that a sizable segment of the population does not have access" to private care, while the dental safety net is "poorly defined and underdeveloped." Dentists' participation in Medicaid is not robust; community health centers and public health facilities have scant dental capabilities; and Medicare offers no dental coverage. "Radical steps" will be needed to correct "a growing disconnect between the dominant pattern of practice...and the oral health needs of the nation," the authors write, including new practice settings for dental care, integration of oral and primary health care, and expanded scope of practice for hygienists and other allied professions.

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ABSTRACT: By many measures, the practice of dentistry has improved for the dentist over the past decade. Hours of work are down, and compensation is increasing. However, there is a growing disconnect between the dominant pattern of practice of the profession and the oral health needs of the nation. To address these needs, the profession will need to take some radical steps toward redefinition, or the responsibility for many of these needs and special populations may shift to other providers and other institutions.

DENTAL DISEASE HAS BEEN WIDESPREAD, recognizing few barriers of class, ethnicity, or economic status. By the middle of the twentieth century the acute manifestations of caries and advanced periodontitis left large numbers of persons with no options except extensive removal of teeth, restoration of the remaining teeth, and either fixed or removable prostheses. As the profession emerged from the Second World War, it was equipped with the skills for extracting teeth and manufacturing a vast array of mechanical structures fabricated from a variety of materials.

The 1950s witnessed the rise of a much more focused approach to science in all of health care. Through this movement the profession began to understand the systemic causes of infection and disease, which led to more scientific evaluation of existing treatments and new evidence-based approaches to prevention and therapy. Key among the preventive developments was the recognition of the efficacy of fluoride in preventing the onset of disease and the application of fluoride through water supplies as a population health strategy. Also contributing to prevention was the widespread information sharing among dentists, dental hygienists, and educators about the causes of infection and the corresponding change in patterns of self-care and treatment in large parts of the population. New restorative techniques, coupled with the middle-class cultural expectation of the annual dental check-up and the disposable income to pay for these preventive and therapeutic services, led to improved oral health for many parts of the population.¹

Although these improvements in oral health are a great success story for the dental profession, science, and the public, patterns of current and incipient oral disease and disability lie outside much of the traditional focus of practice and policy. Emerging concerns for the nation's oral health include access to care for low-income and underserved minority groups, oral diseases related to tobacco use, chronic facial pain, craniofacial birth defects and trauma, and the emergent health needs of an aging population that will need services in new locations and in new forms.² To assess how these epidemiological, social, and economic challenges will confront dentistry, we begin with an assessment of the current dental professional workforce and contrast it, where possible, to the physician workforce.

The Oral Health Care Workforce

There are approximately 150,000 clinically active dentists in the United States.³ The number of dentists has been increasing for the past twenty years, but the growth has leveled off in comparison with the growth in the U.S. population, re-

sulting in a decreasing dentist-to-population ratio (Exhibit 1).

■ **Dentist-to-population ratio.** From 1950 to 1970 the dentist-to-population ratio hovered at 50 per 100,000.⁴ With increasing demand for dental services and growing state and federal investment in education, there was a sharp rise in the ratio through 1990 when it peaked at close to 60 dentists per 100,000 population. In the late 1970s and 1980s there was a growing perception of oversupply in practitioners by many dental professionals, in both practice and education.⁵ Partly in response to this, applications to dental schools declined sharply during the period. A number of schools closed during this period, and others reduced class sizes. The size of the entering dental class reached an all-time high in 1978 at 6,301, but by 1989 it had fallen by just over a third to 3,979.⁶ This dramatic decline had an almost immediate impact, as dentist-to-population ratios began to fall in the decade of the 1990s. By 2020 this ratio is projected to drop back to 52.7, which translates into one dentist for every 1,898 people.⁷

In contrast, the physician-to-population ratio has been increasing for the past forty years and now stands at 286 per 100,000, about one physician for every 349

EXHIBIT 1
Dentist Workforce, Dentist-To-Population Ratio, Dental School Enrollment, And Number Of Dental Schools, 1975–1996

Year	Professionally active dentists	Private-practice dentists	Resident population (thousands)	Dentist-to-population ratio	First-year dental school enrollment	Number of dental schools
1975	107,100	97,000	215,465	49.71	5,763	59
1976	110,300	100,100	217,563	50.70	5,935	59
1977	113,600	103,400	219,760	51.69	5,954	59
1978	117,000	106,700	222,095	52.68	6,301	60
1979	119,400	109,000	224,567	53.17	6,132	60
1980	121,900	111,300	227,225	53.65	6,030	60
1981	124,400	113,800	229,466	54.21	5,855	60
1982	127,000	116,200	231,664	54.82	5,498	60
1983	129,100	118,200	233,792	55.22	5,274	60
1984	131,300	120,200	235,825	55.68	5,047	60
1985	133,500	122,200	237,924	56.11	4,843	60
1986	135,700	124,300	240,133	56.51	4,554	59
1987	138,000	126,400	242,289	56.96	4,370	59
1988	141,100	129,200	244,499	57.71	4,196	58
1989	144,300	132,100	246,819	58.46	3,979	58
1990	147,500	135,100	249,440	59.13	4,001	56
1991	150,800	138,100	252,124	59.81	4,047	55
1992	151,100	138,700	255,002	59.25	4,072	55
1993	151,400	139,300	257,753	58.74	4,100	54
1994	152,000	140,800	260,292	58.40	4,121	54
1995	153,300	141,400	262,761	58.34	4,237	54
1996	154,900	142,100	265,179	58.41	4,255	54

SOURCES: Health Resources and Services Administration, *Health Workforce Personnel Factbook*, Table 301; R.W. Valachovic et al., "Trends in Dentistry and Dental Education: 2001," *Journal of Dental Education* 65, no. 6 (2001): 539–561; and U.S. Bureau of the Census, *Statistical Abstract of the US: 1998*, 118th ed. (Washington: U.S. Bureau of the Census, 1998).

people.⁸ Between 1960 and 1998 the physician population grew by 198.6 percent, while the total population increased only 56.3 percent. Both the physician and dentist ratios vary greatly by region and state.

■ **Age and sex distribution.** The dentist workforce is aging, and a good portion will reach retirement age in the next decade. As shown in Exhibit 2, there are fewer young dentists in practice and fewer dentists working past age sixty-five in comparison to physicians. Just 12.5 percent (19,089) of dentists and 38 percent (4,300) of the entering dental students were women in 1996.⁹ In the same year, women were 21 percent (157,387) of the physician population, 35 percent (34,100) of residents/fellows, and close to 43 percent (6,918) of the entering medical school class.¹⁰

■ **Racial/ethnic composition.** The racial/ethnic distribution of the dentist workforce is among the least diverse of health professions. Approximately 13 percent of dentists are nonwhite, compared with 22 percent of physicians and 29 percent of the population (Exhibit 3).¹¹ Blacks, Hispanics, and Native Americans are generally considered to be underrepresented minorities in the health professions. Dentistry contains 6.8 percent underrepresented minorities, compared with 8.5 percent of physicians and 24.8 percent of the population.¹² First-year dental students in 1999 were 34 percent nonwhite; however, just 10.2 percent of this entering class were underrepresented minorities.¹³ In medicine, 36 percent of first-year students in 1998 were nonwhite, and 14 percent were underrepresented minorities.¹⁴

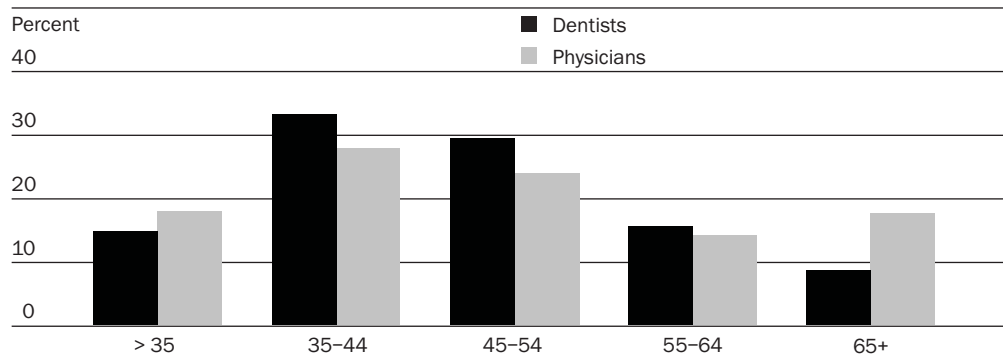
■ **Workforce size.** The dentist workforce is much smaller than the physician workforce. It is growing at a slower rate in comparison to the population, and it tends to be more middle-aged (40–55), more male, and less ethnically diverse.

Practice Characteristics

The vast majority of dentists, more than 80 percent, are in general practice. The remainder are subspecialists, including orthodontists (5.8 percent), oral and

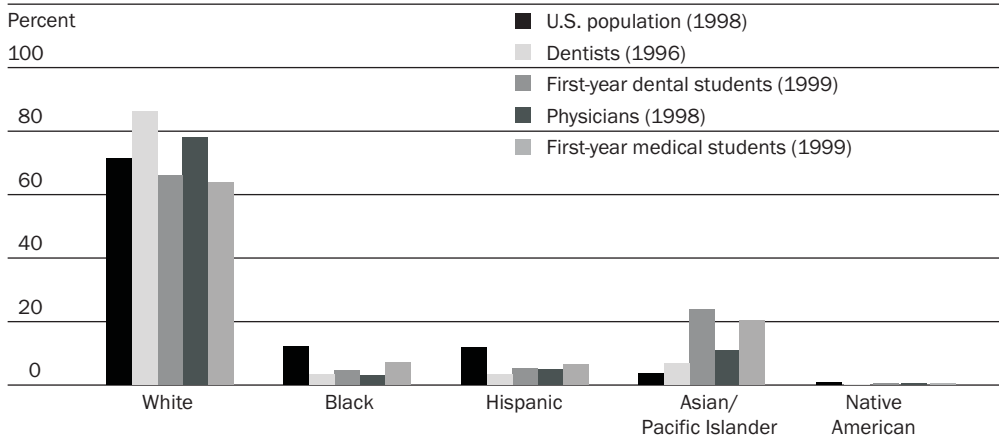
EXHIBIT 2

Age Distribution Of Dentists (1996) And Physicians (1998) In The United States



SOURCES: American Dental Association, Survey Center, *Distribution of Dentists in the United States by Region and State, 1996* (Chicago: ADA, 1998); and American Medical Association, *Physician Characteristics and Distribution in the U.S., 2000 Edition* (Chicago: AMA Press, 2000).

EXHIBIT 3
Variations In The Racial/Ethnic Representation In Dentistry And Medicine,
1996–1999



SOURCES: American Dental Association, Survey Center, *The 1999 Survey of Dental Practice* (Chicago: ADA, 1998); American Medical Association, *Physician Characteristics and Distribution in the U.S., 2000 Edition* (Chicago: AMA, 2000); Association of American Medical Colleges, “FACTS—Applicants, Matriculants, and Graduates,” 24 October 2002, www.aamc.org/data/facts/famg72001a.htm (9 May 2002); R.W. Valachovic et al., “Trends in Dentistry and Dental Education: 2001,” *Journal of Dental Education* 65, no. 6 (2001): 539–556; and U.S. Bureau of the Census, resident population estimates.

maxillofacial surgeons (4.1 percent), periodontists (3.1 percent), pediatric dentists (2.4 percent), endodontists (2.2 percent), public health dentists (0.8 percent), and oral and maxillofacial pathologists (0.2 percent).¹⁵ This contrasts to the distribution in medicine, where approximately one-third practice the general medicine specialties of family medicine, internal medicine, or general pediatrics.¹⁶

■ **Hours worked per week.** Private dental practitioners spent an average of 36.5 hours per week in their offices in 1998. Of these, an average of 33.3 hours were spent treating patients; this figure was 33.4 hours for generalists and 33.0 for specialists.¹⁷ By contrast, physicians in 1999 spent an average of 51.6 hours per week treating patients and an additional 4.7 in other professional activities.¹⁸

■ **Full time versus part time.** The majority of dentists work full time; however, there has been a trend toward increased part-time work. The number of part-time dentists has increased at a greater rate than the number of full-time practitioners. In 1982 only 14.2 percent of dentists worked part time, compared with 23.8 percent in 1995.¹⁹ In conjunction with this trend, the average number of hours spent in the office for both full- and part-time practitioners has fallen, although the average number of hours spent treating patients has increased slightly. Therefore, although there has been an increase in overall numbers of dentists in the past few decades, the American Dental Association (ADA) found only “modest gains in the total number of office hours and the total number of treatment hours available to address the dental care needs of all Americans.”²⁰

■ **Solo versus group practice.** Of all dentists in private practice in 1998, 66.3 percent were solo practitioners working in an incorporated or unincorporated prac-

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tice.²¹ Generalist dentists (67.3 percent) were somewhat more likely to work in a solo practice than specialists were (61.5 percent). Women made up a larger percentage of non-solo practice dentists (13.9 percent) than solo practitioners (7.6 percent).²² An estimated 92 percent of dentists owned their own practices; 76.5 percent were sole proprietors. Most dentists worked in only one office (90.0 percent), while 3.2 percent worked in three or more offices. In contrast, in 1999 only a quarter (25.5 percent) of physicians in active practice were in solo self-employed practice.²³

■ **Income.** Independent dentists’ median net income from all dental sources in 1998 was \$135,000—\$125,520 for general dentists and \$192,000 for specialists.²⁴ The median net income, after expenses and before taxes, for physicians in 1998 was \$164,000; however, the medians across subspecialties ranged from \$120,000 for pediatrics to \$205,000 for orthopedic surgeons.²⁵

■ **Patients’ characteristics.** Of patients in private dental practices in 1998, 21.5 percent were under age fourteen, 58.4 percent were ages fifteen to sixty-four, and 20.2 percent were age sixty-five or older. Almost 56 percent of patients were female.²⁶ It is interesting to note the high percentage of patients older than age sixty-five, as this age category represents only 12.7 percent of the U.S. population. Given that Medicare does not cover dental care and that Medicaid dental benefits are not available in all states even for the elderly who have coverage, this may account for a large portion of out-of-pocket payments.²⁷

On average, 63.7 percent of patients were covered by private insurance in 1998, 5.7 percent were covered by public insurance, and 30.6 percent were uninsured.²⁸ In 1998, \$53.8 billion in private funds was spent on dental services, nearly half of which took the form of out-of-pocket payments.²⁹

■ **Summary of comparisons.** Overall, the practice of dentistry has become a more lucrative and less time-consuming profession over the past decade. In comparison to physicians, dentists work more independently, have a higher rate of solo practice, and have greatly increased their earnings, in some cases surpassing the net income of physicians. Dentistry has remained a “cottage industry,” which has fought incorporation into larger systems of managed care and capitated payments that have permeated medical groups.

The Allied Dental Health Workforce

■ **Hygienists.** Dental hygienists are licensed health care professionals who provide preventive, educational, and therapeutic services for the control of oral diseases and the promotion of oral health. All registered dental hygienists (RDHs) graduate from a minimum two-year college program that includes classroom studies and supervised clinical experience. Dental hygienists also must pass a national written

exam and a state clinical exam to earn the RDH license. Most dental hygienists practice as independent contractors, and many work part time or for more than one practice. The Bureau of Labor Statistics (BLS) estimated that more than 90,000 hygienists practiced in the United States in 2000, with a mean salary of \$48,150.³⁰

■ **Assistants.** Dental assistants work chairside with the dentist, in the business office, and in the dental laboratory. Many states do not require formal training or licensure for dental assistants. However, there are many certified dental assistant training programs, mostly at the community college level, as well as expanded practice dental assistant certifications in many states. The BLS estimates that there were 175,160 dental assistants employed in the United States in 2000, with an average salary of \$24,130.³¹

■ **Laboratory technicians.** Dental laboratory technicians are responsible for filling prescriptions from dentists for bridges, dentures, crowns, and other dental prosthetics. According to the BLS, dental technicians held about 43,000 jobs in 2000, mostly in small dental laboratories. The average salary for a dental technician was \$26,915.³² Formal training for this profession is available primarily through community and vocational programs; however, most dental technicians learn their trade “on the job.” In 2000 there were thirty accredited programs in the United States, although in most states certification is not mandatory.³³

■ **Job growth.** The rate of growth in new jobs in health care occupations is projected to be 28.8 percent between 2000 and 2010. However, among the five health occupations with the lowest rate of growth are dentists (5.7 percent) and dental laboratory technicians (6.3 percent). In contrast, the number of hygienist jobs will grow by 37.1 percent.³⁴

Approximately 62 percent of solo dentists employed at least one part-time or full-time dental hygienist in 1998, compared with 54 percent in 1986.³⁵ Dentists in nonsolo practice tended to employ more hygienists; only 16 percent employed no hygienist. Also, 93.4 percent of all solo general practice dentists employed at least one dental assistant. All nonsolo practices had at least one dental assistant, and more than half employed three or more.³⁶

The projected growth in hygiene positions may indicate a trend for dentists to use more auxiliary staff for preventive and basic restorative care so they can concentrate on more specialized, highly reimbursable procedures. However, although the use of auxiliary staff has increased, these workers are more likely to be employed in group settings or practices, which are still relatively uncommon in dentistry. An increasing number of states are exploring expanded practice rights for dental hygienists, usually for the purpose of providing preventive care for underserved populations. This is allowable by law in only a few states, and independent hygiene practice is still relatively rare.

Dental Services In the Public Health Sector

There is abundant evidence that a sizable segment of the population does not

have access to dental care through the traditional private practice model.³⁷ Yet there is a poorly defined and underdeveloped dental “safety net.” The result is that a growing number of people, many of them children, are unable to get regular dental care through the dental public health system or any other way.

The Health Resources and Services Administration (HRSA) estimates that in 1998 there were only 2,032 public health dental workers employed in federal or state agencies.³⁸ These workers are responsible for planning, developing, implementing, and evaluating programs to promote and maintain the oral health of the public. Functioning at the federal, state, and local levels, these public health workers are defined officially only by their training in dentistry or dental health. Additional public health staff may work on dental public health issues but under a different official title. The release of *Healthy People 2010* and the surgeon general’s report on oral health, which discussed the disparate burden of oral disease on the underserved, stimulated more interest in public health dental programs. However, to staff these programs with professionals willing to work in the public sector with underserved populations is an ongoing challenge.³⁹

There are relatively few public health dentists in the United States. Just 0.8 percent of professionally active dentists in 1998 were public health specialists, approximately 1,207 dentists.⁴⁰ In addition, approximately 400 dentists (in 2002) work for the Indian Health Service, and 258 are serving in the National Health Service Corps.⁴¹ While some dentists volunteer their time to help the underserved, the lack of dentists participating in Medicaid continues to be a major access barrier for many low-income populations.⁴² Community health centers (CHCs), serving 8.6 million people, including 2.8 million Medicaid beneficiaries, were only able to provide 1.2 million patients with preventive and basic dental care in 1998, less than 13 percent of the total clientele.⁴³ Dentists actively fought any Medicare dental benefit when the program was created in the late 1960s. Unless this lack of coverage changes, baby boomers soon reaching retirement age will be faced with no systematic way to finance their dental care.

RDHs, with their occupational growth and focus on preventive care, may be the oral health professionals best poised to address issues of access. However, RDHs are restricted in most states from practicing without a dentist’s supervision. The growing shortage of dentists in many areas limits hygienists’ ability to provide preventive care where it is needed most. The low priority of dental public health within public funding mechanisms has also restricted full-scale prevention activities in schools and health care facilities. While many benefit from fluoridated water, only those who can afford regular dental care receive the benefits of regular, comprehensive preventive care.

Current Crisis Of Care

The recent surgeon general’s report cataloged the advances that have been made in the technology and science of oral health care but also clearly showed that there

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are worsening disparities in the oral health status for certain population groups. Underserved groups include people who are low-income or indigent; live in rural communities; are racial or ethnic minorities, non-English speaking, children, or elderly; and are developmentally disabled or have major medical problems.⁴⁴ Each of these populations faces sizable barriers to care, and all are at a notable disadvantage with poorer health outcomes. Socioeconomic status tends to be the most important indicator for use of services and health outcomes, regardless of race and gender, while people with dental insurance have a higher likelihood of visiting a dentist than do those without.⁴⁵

In no small measure, this is attributable to the current practice model of dentistry, which is structured to serve insured patients or patients who have the disposable income to pay for services out of pocket, in areas served by dental providers. Moreover, dental education trains new providers within the current practice model, leaving little room for developing a different type of practitioner that might appropriately address unmet needs. There is limited public financing for oral health care services outside of private dental offices. The dental safety net is small compared with the medical safety net, and many safety-net providers are underfinanced, understaffed, and overburdened.⁴⁶

Practitioners operating in the traditional delivery service model are able to sustain and increase income while working shorter hours, so they have little financial incentive to modify their practice. This lack of incentive, the limited supply of dentists, and the lack of alternatives for delivery and financing of care mean that much of the population with the greatest and fastest-growing set of needs will continue to be underserved by the traditional system of private practice, fee-for-service dentistry.

Alternatives To Current Practice

A system of dental care that will begin to address the unmet health needs of a growing part of the population will likely need to move beyond the existing system of finance, practice organization, and professional utilization.⁴⁷ The standard response to the lack of dental services is to suggest increasing the number of dentists. Some increase may be warranted, and perhaps inevitable, but it may be more useful to understand this problem less as a problem of supply of practitioners and more as a poor fit between part of the current practice model, the patterns of disease, and the people needing care. Such a change will raise several critical questions, such as the following: Where do those who have the greatest oral health needs receive other health care? What physical and financial impediments could be removed to facilitate meeting current and future demand? Are there social ser-

vice or employment settings that might effectively sponsor oral health services? What motivations might bring the underserved more seamlessly into a system of care? How can expectations regarding oral health be raised within the underserved population?

■ **Alternative organizational structures.** A variety of strategies have been explored to provide some level of improved access to dental care for underserved populations.⁴⁸ On the supply side, public dental clinics, whether freestanding or integrated into larger medical clinics, represent the closest alternative to private practice. Dental vans and mobile dental services have become a popular solution for delivering services to rural communities or schools. Increasingly, school-based or -linked services organize care at easily accessible sites and emphasize preventive care and screening. Teledentistry enables dentists in remote clinics to communicate with specialists in urban centers, to provide better diagnosis and referral.⁴⁹

■ **Increased education about programs.** Alternative organizational structures of dental services are only a part of the equation. Many communities have historically underused dental services. To increase participation in oral health care, focused population-targeted programs concentrate their efforts on increasing education and awareness about services within specific population groups. Some programs go further, providing case management for their clients to ensure proper screening, treatment, and follow-up.⁵⁰ Policy responses to increasing the supply of and demand for dental services must move beyond funding the traditional models of Medicaid coverage and provider incentives to take more charity cases. A sound policy response would vastly expand the dental public health infrastructure to creatively bring those with unmet need into a system of care.

■ **Integrating oral and primary health care.** Another model of care focuses on the reintegration of oral health care into primary health care. This concept is being explored in both the dental and medical communities.⁵¹ One of the keys to improving access to care is making dental services visible, affordable, and convenient for underserved populations. Primary care medicine has more routine contact with these populations, providing opportunities for preliminary dental screening and education as well as integration of clinical services.

Any strategy to address the barriers to care will need to be a collaborative effort across health care providers, as no single profession can tackle the issue alone.⁵² For example, the monitoring of oral health could be incorporated into a chronic care model and be offered in systemic primary care carried out by family physicians.⁵³ This would be beneficial to Medicare recipients who have no dental coverage. Addition of a dental benefit to Medicare is unlikely in the current fiscal environment, and to date alternative public mechanisms to finance dental care for the elderly are not in sight. Although access to care for underserved populations is on the policy screen, the important issues associated with dental care for the elderly have yet to catch policymakers' attention.

■ **Multidisciplinary approach.** The public health system has not been competi-

tive in attracting dentists, so the use of a variety of health professionals and social workers should be considered. Multidisciplinary efforts may better reach underserved populations by combining administrative efforts and public health goals.

■ **Expanded practice for hygienists and assistants.** Expanded practice for dental hygienists and assistants is another option being explored as a way to increase access to preventive services and education.⁵⁴ Pilot studies have shown the expanded practice models to be safe and effective, and these practices have been successful in reaching underserved populations.⁵⁵ Regulatory change around scopes of practice is a slow process, and few states have implemented major changes. Expanding the roles of allied oral health practitioners could increase the contact points for oral health information and care for numerous populations.

■ **New dental school strategies.** It is unlikely that the current dental workforce will be adequate to meet the oral health needs of our communities; therefore, the pipeline for providers is an important issue that must be addressed.⁵⁶ Dental schools could recruit and support more students from underserved backgrounds, who have been shown to be more likely to work in underserved communities.⁵⁷ Education programs also should encourage all oral health providers to serve underserved communities throughout their professional careers. Similarly, an expansion of dental hygiene and dental assisting education may increase the raw supply of these practitioners, but only if this effort is combined with regulatory change that ensures full use of their skills.

■ **Program evaluation.** While experimental interventions to increase demand and alter the structure and financing of care hold promise, evidence of effectiveness is still nascent. For the most part, safety-net programs focus on meeting the enormous volume of demand for services rather than dissipating resources to evaluation. A focused effort on program evaluation, with concentration on cost-effectiveness and patient outcomes, is an important final step for alternative models to gain legitimacy and support. Alternative programs remain a small fraction of all dental services.

M EETING THE CHALLENGES of reducing disparities in oral health care will require fundamental redefinitions of how dental practice is organized, financed, and provided. In the long run, it would seem that systems of oral health care must be either directly integrated into larger systems of care or more effectively articulated with them. Financing of care must be realigned to pay for proven and effective interventions. Finally, the education of dental professionals must focus on community health and well-being, in addition to individual treatment and private practice.

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NOTES

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