

Pipeline Programs in the Health Professions, Part 1: Preserving Diversity and Reducing Health Disparities

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Background: Racial and ethnic minorities are underrepresented in the health professions. Affirmative action and educational pipeline programs play a vital role in increasing the diversity of health professions, addressing educational opportunity gaps, and reducing health disparities. Part 1 of this 2-part series discusses the need for educational pipeline programs to assist underrepresented minorities (URMs) in entering the health professions and the importance of these programs in developing a cadre of diverse providers to reduce health care inequality.

Methods: Part 1 presents an overview of diversity in the medical and health care workforce, educational enrichment programs, key components of successful pipeline programs, and notable pipeline examples for underrepresented students at the University of Nebraska Medical Center. Recommendations for improving and developing pipeline programs are also included. Part 2 reviews affirmative action case law and legislation along with recommendations for maintaining and reviewing diversity pipeline programs in light of recent anti-affirmative action challenges.

Conclusion: Pipeline programs are an important strategy for addressing the shortage of URMs in the health professions. Anti-affirmative action initiatives threaten the existence of these student preparation programs and the ability of our nation to produce physicians of color and other health care providers who are more likely to serve in underrepresented communities and work to reduce related health disparities. Programs at universities and academic medical centers must develop innovative partnerships with underserved communities, adopt strategies that demonstrate a strong commitment to increasing racial and ethnic minorities in the health professions, and develop viable funding mechanisms to support diversity enrichment programs.

Keywords: health disparities ■ children/adolescents ■ minorities ■ education

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BACKGROUND

Affirmative action is one of the most misunderstood and highly controversial phrases in academe, and its role in enhancing the health professional pipeline continues as an emotionally charged debate among academic medicine, the courts, policy makers, and the American public.¹⁻⁵ Today, emerging demographic shifts and widening economic and social divides further shape this debate.

Nevertheless, despite contention over affirmative action programs and the true need for cultural competence training, research still demonstrates that racial and ethnic minority health providers are more likely to serve medically underserved communities and underrepresented minority (URM) patients than their white counterparts.⁶⁻¹⁰ URM dentists and psychologists are also more likely than their nonwhite peers to work in urban and other areas with a higher proportion of racial and ethnic minorities.¹ Consequently, increasing the number of minority health practitioners in these underserved communities must play a major role in reducing health disparities and addressing issues of health care access for at-risk populations.^{1,11}

All health care professionals, regardless of race and ethnicity, have an important obligation in the care and treatment of URMs. However, URM patients have a higher likelihood of selecting health care providers of their own racial or ethnic background.^{1,6} In other words, URMs have a distinguishably different pattern of health care utilization

in comparison to whites.¹¹ URM medical providers play a crucial role in the removal of barriers to health care utilization for all persons in addressing some of the most difficult challenges that plague our health care system.

Hence, academic medicine, P-16 educators, the US government, and health-related organizations must do more to address educational disparities for URM students who wish to enter the medical professions. Since African Americans and Hispanics are among the fastest growing portions of the US population but are still the most underrepresented racial and ethnic groups in medicine, this is a particularly pressing issue. African Americans, American Indians, and Hispanics make up approximately 25% of the US population but only 6% of practicing physicians.¹²

The disproportionately small number of URMs in medical schools further demonstrates these disparities and “opportunity gaps.” For the purposes of discussion, we define opportunity gaps as disparities in individual educational outcomes assumed to be caused by disproportionate opportunities due to race, ethnicity, gender, socioeconomic status, lack of social capital, or breach of civil political, civil, or human rights laws.

Although the number of URM students matriculating at US medical schools is increasing, 2007 data from the Association of American Medical Colleges (AAMC) showed stark differences. For example, AAMC data revealed that only 7.2% of matriculants were Hispanic/Latino, 6.4% were African American, and 0.3% were American Indian/Alaska Native, in contrast to 59.9% who were white.¹¹

Overall, high school completion rates for students aged 18 to 24 remained level from 1987 through 2006, at approximately 82%.¹³ However, substantial completion gaps persist among racial and ethnic minorities in contrast to whites. For instance, Hispanics had the lowest high school graduation rate at 68%, and the 76% graduation rate of African Americans remained unchanged during this 20-year time period.¹³

The highest completion rates for high school students were Asian Americans at 91% and whites at 87%. This provides further evidence of the differences in educational outcomes that exist among racial and ethnic minority groups compared to their white counterparts.¹³

Pipeline, preprofessional, and enrichment programs aimed at diversifying the health professions are crucial to the economic well-being, improved postsecondary academic readiness, and go to the heart of our democratic values as a nation. Consequently, issues of increasing the numbers of URM students in health profession educational programs impact more than the politics of the affirmative action debate.

Part 1 of this article provides an overview of the changing demographics, the “opportunity gap,” and types of disparities that exist among racial and ethnic minorities in the United States. The status of diversity in

the medical profession and health care workforce is also discussed in terms of implications for future health care needs. Trends in minority student US medical school enrollment are also analyzed, and a brief discussion of diversity in other health care professions such as dentistry and nursing are provided.

Additionally, part 1 provides a thematic review of the literature while focusing on key components of successful diversity pipeline programs and examples. A discussion of noteworthy enrichment and pipeline programs at the University of Nebraska Medical Center (UNMC), aimed at increasing the number of URM students in the health professions, is also included. Furthermore, strategies for developing and improving diversity pipeline programs are presented.

While the focus of this manuscript is primarily on P-16 programs, academic readiness programs for pre-school through university students for careers in medicine, there is a brief discussion of pipeline challenges in fields such as nursing and dentistry. Much of the guidance and discourse regarding strategies to strengthen minority student preparation in medicine is transferable to pipeline programming for other health fields. Therefore, although not specifically focused on other health care pipeline programs, this information should assist educators, policy makers, and health care professionals who may wish to develop or implement similar diversity enrichment programs preparing URM students for careers in other health professions.

Finally, part 2 of this series will merge the theoretical concepts of educational equal opportunity and affirmative action law as a means of maintaining and preserving these diversity pipeline programs. For the purposes of this discussion, affirmative action is defined as programs, policies, laws, and strategic plans designed to increase the number of historically underrepresented and disadvantaged groups who have traditionally been the target of unlawful societal discrimination in areas including education, employment, and the political process. Additionally, for purposes of discussion, URM students are defined as racial and ethnic minorities, including African Americans, Hispanic Americans/Latinos, Native Americans/American Indians, Alaska Natives, Hawaiian Natives, and natives of the US Pacific Islands who are typically underrepresented in the fields of medicine, dentistry, nursing, biomedicine, and pharmacy.

THE OPPORTUNITY GAP

As previously noted, an opportunity gap persists as the growing number of ethnic and racial minorities in the United States seek to pursue educational equity, integrate successfully into the health professions, and access quality health care benefits. Fast-paced demographic shifts make these issues of access and equality more imperative.¹⁴

Based on race/ethnicity population data in 2008, one-third of the US populations are currently minorities.

Minorities, as defined by the US Census Bureau, are all individuals except for non-Hispanic single-race whites.¹⁵

By 2050, the US Census Bureau projections indicate that a majority of the US population, 54%, will be from URM groups.¹⁵ Specifically, projections state that by 2050 the minority population will be 235.7 million out of a total US population of 439 million (Figure 1). Overall, the working population, aged 18 to 64, is expected to decline from 63% in 2008 to 57% in 2050. However, the working-age population of minorities is expected to increase by 34% between 2008 and 2050.¹⁵ In short, projections suggest that the minority working-age population is expected to be more than 50% in 2039 and approximately 55% in 2050.¹⁵

These growing gaps in educational equality are more disturbing when coupled with the fact that people of color in the United States are more likely to live in poverty than their white counterparts. According to the Urban Institute and Kaiser Commission on Medicaid and the Uninsured, families of color are more likely to have an income that is 200% of the federal poverty level compared to white families.¹⁶ In 2005, this was equivalent to an income of \$39,342 for a family of 4.^{16,17} More than half of American Indians/Alaska Natives, African Americans, and Hispanics/Latinos are poor in contrast to 26% of whites and 33% of Asians/Pacific Islanders. In terms of the elderly, 70% of Hispanics, two-thirds of African Americans, and half of Asians and Pacific Islanders and

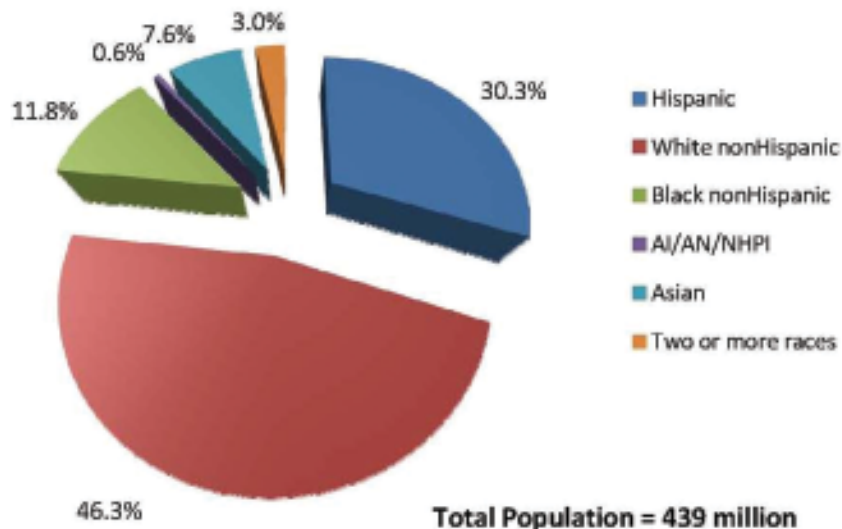
American Indians are poor or living near the poverty level, compared to elderly 38% of whites (Figure 2).¹⁶

According to the Luxembourg Income Study (LIS), which looks at longitudinal data of income in developed countries, at least 20% of children in the United States live in poverty.¹⁴ The LIS looks at longitudinal data of income in more than 30 developed countries. Among the world's wealthiest nations participating in the LIS, the United States has the worst record in terms of reducing poverty for children. Only 4 other developed nations have child poverty rates above 10%—Australia, Canada, Ireland, and Israel.¹⁴

Childhood poverty rates must be placed into context in terms of the growing number of minority children in the United States. For example, the US Census Bureau projects that by 2050, the proportion of URM children in America will increase by 44% from 2008, thereby constituting 62% of America's population.¹⁵ Therefore, child poverty rates in the United States are of particular interest as we think about health care reform and preparing underrepresented groups to enter the health professions.

Social determinants of health are intricately linked to health status. Among them are quality of housing, level of employment, income level, education, poverty, racism, crime rates, political equality, social services, and forms of economic development.¹⁸ Furthermore, race and gender power structures affect the ability of URMs to operate at different levels within our political, judi-

Figure 1. Projected Population Distribution by Race and Hispanic Origin for the United States: 2050



Source: Population Division, U.S. Census Bureau, Table 4 available at <http://www.census.gov/population/www/projections/tablesandcharts.html>
 Release Date: August 14, 2008

Derived from Table 6: Percent of the Projected Population by Race and Hispanic Origin for the United States: 2010-2050 (NP 2008-T6)

Source: US Census Bureau, Population Division

cial, educational, employment, and other systems.¹⁹⁻²¹ As noted by researchers, race and gender power structures vastly impact health conditions due to their influence on hierarchies, institutionalized racism, residential segregation, internalized racism, and racial stereotypes.¹⁹⁻²¹

Social justice advocates point to an interlinkage between social inequalities and fairness as a framework for evaluating inequalities. These proponents of social justice also point out that the social justice framework does not provide a formula for the equitable distribution of health resources or goods.²² The historical inequitable distribution of goods and social services is evidenced in welfare, the New Deal policies, veterans' benefits, and Social Security. These programs were often crafted or administered so as to deny benefits to the poor, migrant workers, farmers, and particularly minorities.^{23,24} While social justice is a valuable tool, such as a reliance on societal fairness, it demonstrably is not enough.²⁵

Additionally, limited access to quality health care in underresourced communities and health disparities among URMs, including the elderly, have prompted recent calls for health care reform in the United States.²⁶ These reform efforts are an attempt to cover the growing number of underinsured and uninsured. Many of the underinsured and uninsured include people of color and the elderly. Racial and ethnic minorities make up more than 50% of the nonelderly uninsured (Figure 2).¹⁶

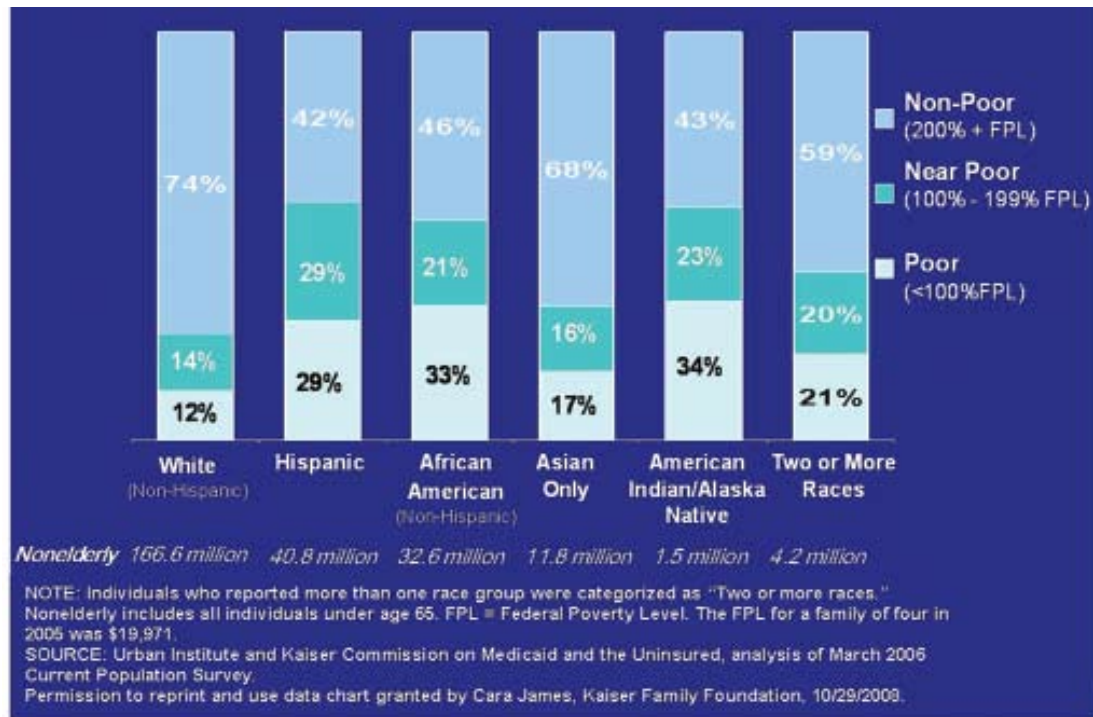
Nationally, Hispanics have the largest number of uninsured individuals and are the least likely to have

employer coverage.¹⁶ The 2006 Commonwealth Fund Health Care Quality Survey found that 43% of Hispanics had no regular doctor or source of care, compared to 15% of whites and 16% of Asian Americans.²⁷ Therefore, with inadequate health care coverage, many Latinos often seek assistance in hospital emergency rooms. This clearly provides only a temporary solution and does not allow for access to preventive or follow-up care.²⁸ Additionally, African Americans and Latinos, who are insured, are twice as likely as whites to rely upon emergency rooms and urgent care facilities as a routine source of care rather than utilizing a private physician or other more prevention-focused health provider.²⁹

The first wave of baby boomers will reach their 65th birthdays in 2011. Therefore, increases in the number of elderly and in the URM population will place demands on the health care system that it is currently unprepared to meet.³⁰ Concerted measures to increase the racial and ethnic diversity of the health care workforce are an important part of the equation in reducing health disparities that continue to plague America's health care system.³¹

In the midst of opportunity gaps and affirmative action debates, the importance of diversity and the need to increase the number of health care practitioners who serve underserved and minority communities remain. The opportunity gap is further demonstrated by the stagnant number of physicians of color in the United States and the low number of minority students applying to and matriculating at American medical schools in compari-

Figure 2. Poverty Status of the Nonelderly Population by Race/Ethnicity, 2005^a



^a Reprinted with permission from the Kaiser Family Foundation.

son to their white peers (Tables 1 and 2).^{1,12,32} Thus, we must endeavor to develop new and innovative approaches to prepare students, particularly students of color, from underresourced communities, to enter the medical and health care fields.

WORKFORCE DISPARITIES IN THE HEALTH PROFESSIONS

Racial and ethnic diversity in the health professions plays an essential role not only in providing quality services and access to care for underrepresented populations but also in meeting the needs of a rapidly changing health care system for all Americans.^{1,32} Diversity among health care providers and in the health professions training is connected to improved patient satisfaction, better practitioner and patient communication, and better educational training experiences for all students.^{1,32,33} Issues of cultural competence and patients' values, beliefs, religion, language, communication styles, and perspectives play into the ability of health care providers to provide quality services.^{26,28,34}

Workforce data from 2007 reveal that of 973 524 non-federal physicians in the United States and its territories, only 2% were African American, 3% Hispanic, 8% Asian, and fewer than 1% American Indian. In contrast, 44% were white. As a point of definition, "nonfederal physicians" are allopathic (MD) and osteopathic physicians (DO) who are not employed by the federal government; they account for 98% of the physician workforce.³⁵

With the recent influx of migrant and immigrant workers in rural meatpacking and agricultural areas, the lack of health providers in rural areas must also be a priority in addressing health disparities and receiving sound health care.³⁶ According to the 2005 *National Health Care Disparities Report*, 20% of Americans live in rural locations, and only 9% of physicians practice in these areas.³⁷

The need to expand the number of nurses and other health care providers to reach health care demands is also imperative. Although the percentage of minority nurses in the total nursing population rose from 7% in 1990 to 12% in 2000, the percent of nurses from racial/ethnic minority groups is far less than the proportion of URMs in the general US population.³⁸ Similarly, approximately 6.8% of practicing dentists are URMs, and in 2004 only 11.6% of first-year enrollees in US dental schools were African American, American Indian, or Hispanic.^{39,40} During the same period, whites and Asians/Pacific Islanders constituted 71.1% of all first-time dental school enrollees.^{39,41}

THE STATUS OF DIVERSITY IN US MEDICAL SCHOOLS

In a 2006 statement, the AAMC called for a 30% increase in enrollment at existing medical schools over the next decade, the establishment of new medical schools, and the advancement of programs to further

enrollment expansion and increase the graduation rates of racial and ethnic minorities in medical education.⁴² Based on 2002 data, in which there were 16 488 new matriculants in allopathic medical schools, a 30% increase equated to approximately 4946 new matriculants per year, or 21 434 new matriculants by 2015.⁴²

Despite research that points to the benefit of diversity in medical education such as improving cross-cultural, intellectual, and interpersonal benefits for all students,^{12,43,44} URMs continue to be disproportionately represented in medical schools in contrast to whites.^{1,11,32} Data from the AAMC show that URMs continue to be underrepresented in medical schools. Data from 2002 to 2007 show that there has actually been a decline in the proportion of URMs graduating, even though the actual number of URMs graduating had increased due to increases in medical school class size and the number of medical schools.⁴⁵

In 2002 Hispanics, including those graduating from medical schools in Puerto Rico, comprised 6.1% of graduates, and in 2007 this figure increased to only 6.8%.⁴⁵ African Americans accounted for 6.9% of graduates in 2002 and 6.7% in 2007.⁴⁵ Similarly, American Indians, who were fewer than 1% of graduates in 2001, remained static in 2007.⁴⁵ These figures are disturbing in light of the AAMC's call for an increase in the number of medical school enrollees by 30% in order to serve a rapidly expanding population and geographic maldistribution of physicians in underserved, rural, and urban areas.¹³

Nevertheless, tribal organizations, health organizations, educational funding agencies, and the American government must continue to develop creative approaches to reduce the disparities in terms of the number of American Indians entering medical schools.

MEDICAL SCHOOL APPLICANTS

During the period of 2002-2007, the overall applicant pool to US medical schools increased from 33 625 applicants to 42 315 applicants, an increase of nearly 26% (Table 1). Despite an increase in actual numbers from 5205 in 2002 to 6393 in 2007, the percentage of applicants who were URMs remained flat at 15%. Of the URM groups, Hispanics experienced an increase in the numbers from 2443 to 2777, an increase of 14%, while the number of African Americans increased from 2614 to 3133, a nearly 20% increase. (Table 1)

MEDICAL SCHOOL MATRICULANTS

Due to the expansion in medical school class size and additional new medical schools, the number of new entrants to US medical schools grew from 16 488 in 2002 to 17 759 in 2007 (Table 2). The number of URM matriculants increased from 2317 in 2002 to 2505 in 2007. This increase was largely accounted for by an increase in the number of

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Hispanics from 1130 to 1277. However, the actual percentage of URM matriculants remained flat at 14%.

In reviewing the status of URMs in medical schools, it is also essential to consider the institutions where most URM students matriculate. Having a critical mass of URM students is an important element for success. Not surprisingly, the 3 historically black colleges and universities' (HBCUs) medical schools had the largest number of African American matriculants in 2007 and accounted for 17% of African American matriculants: Howard University College of Medicine (92 students), Meharry Medical College (79 students), and Morehouse School of Medicine (39 students).¹¹ The 3 US medical schools in Puerto Rico matriculated 61% of all Puerto Rican and 17% of all Hispanic matriculants in 2007: University of Puerto Rico School of Medicine (103 students), Universidad Central del Caribe School of Medicine (62 students), and Ponce School of Medicine (57 students).¹¹ In addition, the medical schools with the largest number of American Indians and Alaska Native matriculants were University of Oklahoma College of Medicine (19 students), University of Minnesota Medical School Duluth (8 students), and University of North Dakota School of Medicine and Health Sciences (5 students).¹¹

There is a need for more concerted efforts to increase URM representation in the health professions, and affirmative action programs have provided a much-needed avenue for progress.⁴⁶ It is important to note that many of the URM matriculants are trained at historically black institutions or predominantly minority-serving institutions.¹¹ Thus, we must look closely at the role of affirmative action law and policy in broadening the pipeline for URM students at all medical schools and academic health centers.

THEMATIC REVIEW OF THE LITERATURE— DIVERSITY PIPELINE AND ENRICHMENT PROGRAMS

Pipeline programs are designed to increase the representation of African American, Latino, American Indian, and other underserved groups in the health professions. For the purposes of this discussion, we will use the terms pipeline programs, enrichment programs, and preprofessional programs interchangeably. While individuals in many racial and ethnic groups are considered URMs, we understand that URMs may differ based on context, geographical location, profession, and culture.

One of the most notable preprofessional programs for URMs, The Robert Wood Johnson Foundation Minority Medical Education Program (MMEP), was launched in 1989 as a 6-week summer educational experience to help minority students (African American, Mexican American, mainland Puerto Rican, and Native American) gain admission to medical schools.⁴⁶ Based upon information from a study commissioned by the foundation, the MMEP included enriched academics, advising, test preparation, and clinical exposure. Unlike other programs in existence at the time, the program was not intended to be remedial, but rather to focus on those students who, with some additional academic assistance, would be most likely to gain acceptance to medical school.⁴⁷ It should be noted that the MMEP name was changed to the Summer Medical Education Program (SMEP) in order to reflect a broader targeted population.

The evaluation of the MMEP showed an increased probability of medical school acceptance among its undergraduate participants, especially those students participating in MMEP after the freshman or sophomore year in college.^{47,48} Institutions with preadmission programs were more likely to have a positive change in the number of URMs enrolled.^{47,49}

Table 1. Race and Hispanic Origin of Applicants to US Medical Schools, 2002-2008

	2002	2003	2004	2005	2006	2007	2008
Non-Hispanic							
African American	2614	2741	2802	2810	2929	3133	3,024
American Indian or Alaska Native	112	85	107	95	147	151	131
Native Hawaiian	36	23	39	42	113	110	112
Asian	5951	6153	6735	7296	7546	8390	8279
White	19 458	20 236	21 045	21 755	22 690	24 136	23 813
Other	527	608	110	50	85	77	84
Multiple race	1235	1329	1104	1134	925	1004	991
Unknown	270	167	221	276	419	505	909
Hispanic	2443	2490	2546	2710	2777	2999	3086
Non-US citizen or permanent resident	979	959	1026	1205	1477	1810	1802
	33 625	34 791	35 735	37 373	39 108	42 315	42 231

Note: Race data are presented only for those individuals selecting 1 category.

Source: Association of American Medical Colleges Data Warehouse: Race and Hispanic Origin of Applicants 2002-2008. Reprinted with permission from the Association of American Medical Colleges. Unpublished data table, Office of Management and Budget Directive 15 Display: Race & Hispanic Origin of Applicants 2002-2008.

In 2003 Robert Wood Johnson Foundation modified this initiative to include dentistry and the program was renamed the Summer Medical and Dental Education Program (SMDEP).⁵⁰ Based on the MMEP evaluation, the SMDEP now focuses on rising sophomores and juniors.^{47,50} Additionally, the target audience was broadened to focus on racial and ethnic minorities underrepresented in medicine as defined by each program site or students from economically or educationally disadvantaged backgrounds. There are 12 SMDEP sites, with oversight and technical assistance for SMDEP provided by the National Program Office in conjunction with the AAMC and the American Dental Education Association.⁵⁰ Although the SMDEP structure is similar to the MMEP, there is now more focus on core academics (pre-calculus, biological, chemistry, and physics), writing, and critical thinking, with less focus on clinical shadowing or test preparation for either the Medical College Admission Test (MCAT) or Dental Admission Test.⁵⁰

In summary, since 1989, 16 575 students have participated in summer health-related career pipeline programs.⁴¹ According to 2008 AAMC data, 14 615 students participated in MMEP and SMEP.⁵¹ Of these participants, 61% or 8903, applied to medical school, and 64% or 5635 of participating students were accepted. The actual number of MMEP and SMEP students matriculating to medical schools was 98%.⁵¹ Recently, the SMDEP National Program Office launched a new tracking database in order to assist in gathering additional data on SMDEP scholars in 2008.

In 1991 the AAMC launched Project 3000 by 2000, a national initiative with a goal of increasing the number of minority medical students to 3000 by the year 2000.⁵² This effort recognized that endeavors to increase URM medical school enrollments between the mid-1970s and 1990 yielded little gain. Furthermore, since it required schools to identify a project point person and provided

them with detailed data on their specific applicant pool, Project 3000 by 2000 was unique at the time. Underpinning 3000 by 2000 was a recognition that traditional pipeline programs and URM recruitment would be insufficient to achieve the goal of parity.

Likewise, an analysis of educational data in 2000 demonstrated that a major contributing factor to the lack of URMs matriculating in medical school, as well as other health professions, was that URM students were less likely to graduate from high school with the rigorous science and mathematics academic background needed to succeed in prehealth professions courses such as biology, calculus, physics, and chemistry.⁵³ For example, fewer than 3% of 312 000 African American 17-year-olds were proficient in science and math as measured by the National Assessment of Education Progress.⁵³ However, high school level math and science proficiency is considered an essential foundation for successful completion of university-level science and mathematics courses.⁵³ Referring to Project 3000 by 2000, Dr Jordan J. Cohen, President of AAMC, noted in September 2000 that

*Despite the hard work of medical schools across the country, no more than 1700 individuals from racial/ethnic groups underrepresented in the physician workforce will be among some 16 100 new medical students receiving their symbolic 'white coats' this month.*⁵²

Among the reasons suggested by Dr Cohen for the lack of progress were court decisions and voter-sponsored initiatives in key states thwarting highly successful affirmative action programs.⁵²

As a direct result of Project 3000 by 2000, the Health Professions Partnership Initiative (HPPI) was implemented in 1996.⁵⁴ The HPPI was a collaboration between

Table 2. Race and Hispanic Origin of Matriculants to U.S. Medical Schools, 2002-2008

	2002	2003	2004	2005	2006	2007	2008
Non-Hispanic							
African American	1126	1060	1086	1068	1156	1139	1144
American Indian or Alaska Native	49	35	48	33	68	61	58
Native Hawaiian	12	5	11	18	34	28	28
Asian	3031	3064	3094	3313	3245	3535	3578
White	9974	10124	10343	10295	10551	10632	10632
Other	214	207	38	19	23	20	29
Multiple race	562	627	498	535	452	449	440
Unknown	180	116	134	190	266	292	421
Hispanic	1130	1091	1175	1269	1286	1277	1416
Non-US citizen or permanent resident	210	212	221	263	280	326	290
	16 488	16 541	16 648	17 003	17 361	17 759	18 036

Note: Race data are presented only for those individuals selecting one category.

Source: AAMC Data Warehouse: Race and Hispanic Origin of Matriculants 2002-2008.

Reprinted with permission from the Association of American Medical Colleges.

the AAMC, the Robert Wood Johnson Foundation, and the W.K. Kellogg Foundation. HPPI challenges US health professions schools to link with neighboring colleges and K-12 school districts to improve curricular and educational programs in order to prepare and attract more underrepresented students into health careers.⁵⁴ HPPI grants were awarded to 26 institutions over 9 years and facilitated the development of 26 programs in which health professions institutions partnered with undergraduate institutions and K-12 educational programs.³¹

HPPI activities included establishing and enhancing existing high school health professions academies or magnet programs, actively involving the families of URM middle and high school students, coordinating educational pipeline programs to enable more URMs to excel academically and advance through the pipeline, and developing internships for students.⁵⁴ Additionally, HPPI partnerships concentrated on helping students understand the wide range of public and clinical health career options available and partnerships to strengthen the math and science skills of both teachers and students through seminars and enrichment programs.⁵⁴

The most successful diversity pipeline components have focused on academic enrichment (especially in science and mathematics), admissions preparation, mentoring, financial support, psychosocial support, and professional opportunities.⁵⁵⁻⁵⁹ Partnerships between health professional schools, public school systems, and community-based organizations play an essential role in increasing the number of URM students entering health professions schools.^{60,61}

In light of recent threats to affirmative action in Nebraska and other states, the next section highlights a few of the University of Nebraska Medical Center's diversity pipeline programs that have been crucial in providing academic enrichment and pathways for entry into the health professions. These programs also provide URM students exposure to a variety of health career options.

UNIVERSITY OF NEBRASKA MEDICAL CENTER PIPELINE PROGRAMS

UNMC has several programs designed to develop and increase the pipeline of URMs and disadvantaged students interested in health-related careers. All programs focus on providing rich structured experiences for talented students interested in pursuing health care professional careers and improving academic readiness for rigorous science and math coursework. Additionally, URM students participate in clinical shadowing programs with physicians, researchers, and other health care providers to promote their interest in entering medicine and to promote mentoring experiences.

UNMC is one of the sites for the SMDEP. As previously noted, SMDEP is a 6-week residential program for approximately 80 college students who have completed their freshman or sophomore year. In addition to the

required core academics, UNMC SMDEP scholars take mini-courses in medical humanities and public health. Large-group didactic lectures, supplemented with small-group discussions, are lead by UNMC medical students. Medical scholars spend one-half day a week in an anatomy course and shadowing opportunities, while dental scholars spend a full day at the UNMC College of Dentistry, where they participate in classes and receive hands-on experiences in the dental lab. Of the 240 SMDEP scholars completing the program at UNMC, 11 have been accepted to the UNMC College of Dentistry and are in the process of matriculating. Also, 5 UNMC SMDEP scholars have been accepted to the UNMC College of Medicine, and 4 of the 5 SMDEP scholars have matriculated (UNMC SMDEP National Program Office Site Visit Manual. Unpublished, 2008).

The Nebraska University Pre-Admissions to the Health Sciences (NU-PATHS) is a collaborative program developed by the 4 University of Nebraska campuses. NU-PATHS identifies academically talented underrepresented students, educationally/economically disadvantaged undergraduates, students who sincerely demonstrate an interest in reducing health disparities, and students interested in serving medically underserved communities.⁶² Additionally, NU-PATHS students receive a full tuition scholarship for their undergraduate prerequisite program at University of Nebraska System campuses, obtain career advising and mentorship from their undergraduate campus and from UNMC faculty in their professional program of choice, and participate in a pre-professional program of study. Upon successful completion of their undergraduate preprofessional program of study, NU-PATHS students are guaranteed admission to their selected professional program at UNMC.⁶²

Between 2001 and 2008, there have been 28 African American, 13 Asian, 44 Hispanic/Mexican American, 6 other, and 8 American Indian students admitted to the UNMC NU-PATHS program (McNamee M. *NU-PATHS Student Data Summary 2001-2008*. Unpublished, 2008). Of these participating students, 11 African American NU-PATHS students have matriculated or are transitioning to UNMC as a part of deferments, having completed prerequisite coursework or degree programs, and other academic requests. Since the program's inception, 1 American Indian NU-PATHS student has graduated from the UNMC College of Medicine.

However, some of the more difficult transition and matriculation issues for UNMC have been with Hispanic/Mexican American and American Indian NU-PATHS students. Strategies to address cultural issues related to living without cultural ties and family nearby, proximity to home, family expectations, and obligations related to concepts of the extended family are being addressed by UNMC in collaboration with tribal and Latino organizations. In the last 7 years of NU-PATHS existence, only 1 Hispanic and 1 American Indian student have transi-

tioned to UNMC, respectively, in the dental hygiene program and physical therapy programs, respectively. Of the 13 Asian students admitted to NU-PATHS, 6 have transitioned to UNMC, and 2 have graduated from the College of Dentistry (McNamee M. *NU-PATHS Student Data Summary 2001-2008*. Unpublished, 2008).

Similarly, the Rural Health Opportunities Program (RHOP) identifies rural residents willing to pursue health care careers in order to reduce health disparities in rural locations.⁶³ Upon successful completion of studies, selected students from postsecondary institutions throughout rural Nebraska are guaranteed admission to professional health career programs, including medicine and dentistry, at UNMC. Since RHOP originated in 1989, there have been approximately 436 RHOP participants across all UNMC academic health programs (University of Nebraska Medical Center; RHOP. Unpublished report, 2008). Seventy-seven of these RHOP scholars have graduated from the UNMC College of Medicine and 28 are currently enrolled, as of fall 2008. In the college of dentistry, there are currently 15 RHOP scholars enrolled, and 38 have graduated. Additionally, the RHOP has produced 1 American Indian dentist and 1 Hispanic female dentist (University of Nebraska Medical Center; RHOP. Unpublished report, 2008).

The Virginia-Nebraska Alliance is a collaboration among UNMC, 5 HBCUS, and other postsecondary institutions in Virginia to address the need to diversify the health care workforce and increase the number of underrepresented and disadvantaged students in academic health programs. Originally, members of the Alliance included J. Sargeant Reynolds Community College, UNMC, and Virginia Commonwealth University. In 2006 the alliance welcomed the University of Richmond, the University of Virginia (UVA), and Eastern Virginia Medical School as academic partners; Virginia Tech joined the Alliance in 2008.⁶⁴

Dr Louis Sullivan, former US Secretary of Health and Human Services, serves as the president and chair of the alliance. The alliance provides URM students a multitude of educational and research opportunities in health careers. Additionally, the alliance seeks to provide faculty members with opportunities for collaborative teaching and research.⁶⁴

Of the 27 African American students participating in the alliance at UNMC in various research and pipeline programs, 3 are enrolled in the College of Medicine at Howard University, Meharry Medical College, and Virginia Commonwealth University. Two have entered PhD programs at Virginia Commonwealth University, and 1 has at Virginia Tech. Additionally, the African American student in medicine at Meharry also completed a postbaccalaureate program at another institution. One student has also been admitted to UNMC's new postbaccalaureate certificate program for fall 2008, (McNamee M. Unpublished report: Virginia-Nebraska Alliance Students, 2004-2008, 2008).

UNIVERSITY OF NEBRASKA MEDICAL CENTER'S POSTBACCALAUREATE CERTIFICATE PROGRAM

UNMC's postbaccalaureate began as a pilot program in academic year 2007-2008 and enrolled 2 students; both students were admitted to UNMC's College of Medicine for fall 2008.⁶⁵ The postbaccalaureate program is a 1-year program of graduate coursework in the sciences targeted at students from underrepresented groups, including those from rural areas and educational or economically disadvantaged backgrounds. The certificate program is designed to enhance a student's science and critical thinking in preparation to enhance potential for admission to the UNMC College of Medicine.⁶⁵ Additionally, UNMC's postbaccalaureate certificate program received full approval by the University of Nebraska Board of Regents in summer 2008.

EXPANDING THE PIPELINE—STRATEGIES FOR IMPROVEMENT

Principles of affirmative action have long been applied to not only college admissions but also the selection of URM and women for pipeline, preprofessional, and precollege programs. Additionally, these admission approaches to improving higher education access, academic readiness, and educational equal opportunity for URM have been criticized by opponents of affirmative action as discriminating against whites and debasing the quality of academia.⁶⁶⁻⁶⁸

Therefore, the passage of Nebraska's Initiative 424 on November 4, 2008, requires UNMC and other public higher education institutions in the state to develop new and innovative ways to ensure diversity without considering race, ethnicity, color, gender, or national origin as factors in the admission of students into pipeline and other academic programs. Because affirmative action is clearly under intense scrutiny, academic medical centers and universities throughout the nation must develop novel ways to strengthen and expand pipeline programs for URMs. Below are strategies that should be considered in the implementation of enrichment programs aimed at improving academic readiness for racial and ethnic minority students.

- Expand the number of academic partnerships with local public school districts to increase enrollment in pipeline programs for URM students—Sustained partnerships between local school districts, community-based organizations, and health professions schools provide curricula and experiences that make science exciting and relevant to students.⁶⁹ Early exposure to rigorous science programs will prepare students to be competitive for undergraduate and medical school.
- Increase the number of undergraduate and postbaccalaureate programs that seek to increase enrolment in medical education for traditional and

nontraditional URMs—Pipeline programs for URM college students and individuals with bachelor's degrees have been successful in preparing URMs for the rigors of medical school.^{48,69}

- Proactively recruit URMs and develop “holistic” admissions strategies in medical school admissions—The selection of well-qualified future health care professionals should be based both upon academic indicators, such as MCAT scores and grade point average, as well as nonacademic factors, including talents, interests, and ability to overcome adversity.⁷⁰ Admissions criteria should also focus on an applicant's commitment to working in underserved areas and with vulnerable populations.

In *Learning from Others*, a publication resulting from a review of the HPPI programs and a partnership, the literature review suggests several key elements to consider in creating successful partnerships:⁶⁰

- Academic preparation programs must start early, be intensive, and persist throughout schooling.⁶⁰
- Programs should work and resonate with teachers and school systems—These types of programs present greater opportunities for change and improvement than do programs focusing on individual students.⁶⁰
- Partnerships must consider the unique cultures, skills and goals of each member, and the services and resources offered should be those sought and valued by the partners, not imposed by one partner or another.⁶⁰
- Increase the level of funding for P-16 education to improve educational achievement—Increased financial support of preschool and elementary education can increase the level of academic achievement of URMs and students residing in underserved neighborhoods. Academic health centers should also join other community partnerships in working with the public school systems to ensure that URM students are academically prepared to successfully complete college and compete for admission to medical school or other health professions schools.
- Develop academic standards and institutional programs in line with the Liaison Committee on Medical Education (LCME) accreditation standards on diversity—For example, LCME's June 2008, newly Revised Standard MS-8 reads: “Each medical school must develop programs or partnerships aimed at broadening diversity among qualified applicants for medical school admission.”⁷¹ A formal system that ties accreditation to diversity provides an impetus for universities, medical schools, and other health

professions schools to actively seek out URMs and develop systematic policies and programs that support URMs in health professional careers. The LCME has promulgated additional standards on diversity that strengthen these requirements for diversity.⁷¹

- Develop a public relations campaign on diversifying the health care workforce that includes forms of social networking and technology infusion—The AAMC's “Aspiring Docs”⁷² and ExploreHealthCareers.org⁷³ are excellent models for communicating to potential URM students, high school and college advisors, and other stakeholders. Both are excellent mediums for marketing pipeline programs. Partnering with AAMC's “Aspiring Docs” is one possible example. Nevertheless, universities and academic medical centers should further develop a well-coordinated recruitment media campaign to establish partnerships with public school systems and community colleges by making a connection through a “valuing diversity” theme. The public relations campaign should educate stakeholders on the value of a diversified workforce, conduct recruitment programs within communities, and ensure that dedicated staff members regularly attend regional and national recruitment meetings and conferences in order to share best practices. Academic health centers must also infuse social networking such as blogs, Facebook, MySpace, YouTube, and other forms of messaging and communication into their campaigns.
- Hire URMs into senior-level administrative and tenured faculty positions—URMs in senior administrative and faculty positions can serve as role models for students, staff, and faculty. Administrators and faculty members must be compensated appropriately and have their work supported by university administration. Academic medical centers must also pursue the hiring of not only junior faculty but also more experienced URM tenured faculty to serve as mentors for students and experts in their respective fields. Additionally, URMs in leadership positions must be highly visible within the university and the community at large, but must not shoulder the core weight of mentoring URMs or supporting and staffing diversity pipeline programs in contrast to their white peers.
- Provide stable and consistent institutional support—Diversity pipeline programs require institutional support, including financial and properly staffed personnel, in order to be effective. Pipeline programs that are strategically planned and have a demonstrated solid commitment throughout all levels of the institutional hierarchy are more likely to be successful.

CONCLUSION

Despite a culture of anti-affirmative action activism, URM physicians and other health professionals are still needed as one solution to address the significant problem of health disparities in our nation. While answers to these taxing problems require a variety of collaborative partnerships, increasing the number of minority health care providers must play a major role in health care reform for the rapidly changing American demographics.

Historic and contemporary opportunity gaps contribute to disparities in the number of minority health care professionals available and the number of URM students entering the medical and health care professions. Therefore, academicians, health care providers, policy makers, and university officials must have a basic understanding of affirmative action law in order to develop diversity programs to address educational disparities.

Part 2 of this article provides an overview of affirmative action law and related legislative efforts that impact diversity programming in the health professions. Strategies are provided in hopes of assisting academic medical centers and universities in preserving, protecting, and expanding these critical pipelines.

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REFERENCES

1. Smedley BD, Butler AS, Bristow LR, et al. *In the nation's compelling interest: ensuring diversity in the health-care workforce*. Washington, DC: National Academies Press; 2004.
2. Levi AS, Fried Y. Differences between African Americans and Whites in reactions to affirmative action programs in hiring, promotion, training, and layoffs. *J Appl Psychol*. 2008;93:1118-1129.
3. Bouville M. Is diversity good? Six possible conceptions of diversity and six possible answers. *Sci Eng Ethics*. 2008;14:51-63.
4. Crosby FJ, Iyer A, Sincharoen S. Understanding affirmative action. *Annu Rev Psychol*. 2006;57:585-611.
5. Zuriff GE. Is affirmative action fair? *Am Psychol*. 2004;59:124-125; discussion 125-126.
6. U.S. Department of Health & Human Services. Changing demographics: implications for physicians, nurses, and other health workers: U.S. Department of Health & Human Services Health Resources and Services Administration, Bureau of Health Professions, National Center for Health Workforce Analysis; Spring 2003. <ftp://ftp.hrsa.gov/bhpr/nationalcenter/changedemo.pdf>. Accessed October 30, 2008.
7. Grumbach K, Hart LG, Mertz E, et al. Who is caring for the underserved? A comparison of primary care physicians and nonphysician clinicians in California and Washington. *Ann Fam Med*. 2003;1:97-104.
8. Reede JY. A recurring theme: the need for minority physicians. *Health Aff (Millwood)*. 2003;22:91-93.
9. Weissman JS, Campbell EG, Gokhale M, et al. Residents' preferences and preparation for caring for underserved populations. *J Urban Health*. 2001;78:535-549.
10. Rabinowitz HK, Diamond JJ, Veloski JJ, et al. The impact of multiple predictors on generalist physicians' care of underserved populations. *Am*

J Public Health. 2000;90:1225-1228.

11. Association of American Medical Colleges. *Diversity in medical education: facts & figures 2008*. Washington, DC: Association of American Medical Colleges; 2008.
12. Association of American Medical Colleges. America needs a more diverse physician workforce. http://www.aamc.org/newsroom/press-rel/2006/physician_diversity_facts.pdf. Accessed October 30, 2008.
13. Ryu M. *Minorities in higher education 2008: twenty-third status report*. Washington, DC: American Council on Education; 2008.
14. Levy BS, Sidel VW. *Social injustice and public health*. Oxford, UK: Oxford University Press; 2006.
15. U.S. Census Bureau. An older and more diverse nation by midcentury. August 14, 2008. <http://www.census.gov/Press-Release/www/releases/archives/population/012496.html>. Accessed November 12, 2008.
16. James C, Thomas M, Lillie-Blanton M, et al. Key facts: race, ethnicity & medical care. Washington, DC: Henry J. Kaiser Family Foundation. January 2007. <http://www.kff.org/minorityhealth/upload/6069-02.pdf>. Accessed October 28, 2008.
17. Department of Health and Human Services, Office of the Secretary. Annual update of the HHS poverty guidelines. Notices, Vol. 70: Federal Register: February 18, 2005; 2005:8373-8375.
18. World Health Organization Commission on the Social Determinants of Health. Closing the gap in a generation: health equity through action on the social determinants of health final report. http://www.who.int/social_determinants/final_report/csdh_finalreport_2008.pdf. Accessed November 3, 2008.
19. Hofrichter R. *Health and social justice: a reader on the politics, ideology, and inequity in the distribution of disease*. 1st ed. San Francisco, CA: Jossey-Bass; 2003.
20. Raphael D, ed. *Social determinants of health: Canadian perspectives*. Toronto, Ontario: Canadian Scholars' Press Inc; 2004.
21. Fiscella K, Williams DR. Health disparities based on socioeconomic inequities: implications for urban health care. *Acad Med*. 2004;79:1139-1147.
22. Anand S, Peter F, Sen AK. *Public health, ethics, and equity*. Oxford, UK: Oxford University Press; 2004.
23. Liberman, RC, Lapinski, JS. American federalism, race and the administration of welfare. *Br J Pol Sci*. 2001; 31:303-329.
24. Valocchi, S. The racial basis of capitalism and the state, and the impact of the new deal on African Americans. *Soc Problems*. 1994; 41:347-362.
25. Katznelson I. *When affirmative action was White: an untold history of racial inequality in twentieth-century America*. 1st ed. New York, NY: W.W. Norton; 2005.
26. Smedley BD, Stith AY, Nelson AR, et al. *Unequal treatment: confronting racial and ethnic disparities in health care*. Washington, DC: National Academies Press; 2003.
27. Beal AC, Doty, MM., Hernandez, SE, et al. Closing the divide: how medical homes promote equity in health care. In: *Results from the Commonwealth Fund 2006 health care quality survey*. Boston: The Commonwealth Fund; June 2007. http://www.commonwealthfund.org/usr_doc/1035_Beal_closing_divide_medical_homes.pdf?section=4039. Accessed November 16, 2008.
28. Chong N. *The Latino patient: a cultural guide for health care providers*. Yarmouth, ME: Intercultural Press; 2002.
29. Lillie-Blanton M, Lewis CB. *Policy challenges and opportunities in closing the racial/ethnic divide in health care*. Washington, DC: The Henry J. Kaiser Family Foundation; March 2005.
30. LaVeist TA. *Minority populations and health: an introduction to health disparities in the United States*. 1st ed. San Francisco, CA: Jossey-Bass; 2005.
31. Cohen JJ. The future of the health professions pipeline: a new call to action. *Acad Med*. 2006;81:S60-S61.
32. Association of American Medical Colleges. Diversity in the physician workforce: facts & figures 2006. Washington, DC: Association of American Medical Colleges; 2006. https://services.aamc.org/Publications/showfile.cfm?file=version79.pdf&prd_id=161&prv_id=191&pdf_id=79. Accessed November 3, 2008.
33. Cooper LA, Beach MC, Johnson RL, et al. Delving below the surface. Understanding how race and ethnicity influence relationships in health care. *J Gen Intern Med*. 2006;21[suppl 1]:S21-27.

34. Satcher D, Parnes RJ, Woelfl NN (Eds). *Multicultural medicine and health disparities*. New York, NY: McGraw-Hill; 2006.
35. Association of American Medical Colleges. United States: distribution of nonfederal physicians by race, 2007. <http://www.statehealthfacts.org/comparetable.jsp?ind=431&cat=8>. Accessed October 29, 2008.
36. Carranza MA, Gouveia L. The integration of Hispanic/Latino immigrant workforce: final project report. <http://www.unomaha.edu/ollas/pdf/HLI-WSREPORTfinal.pdf>. Accessed November 3, 2008.
37. U.S. Department of Health and Human Services, US Agency for Healthcare Resources Administration and Quality. *2005 national healthcare disparities report*. Rockville, MD: US Department of Health and Human Services, Agency for Healthcare Research and Quality; 2005.
38. Spratley E, Johnson A, Sochalski J, et al. The registered nurse population: findings from the national sample survey of registered nurses. <ftp://ftp.hrsa.gov/bhpr/msurvey2000/msurvey00.pdf>. Accessed November 11, 2008.
39. Andersen RM, Carreon DC, Friedman JA, et al. What enhances underrepresented minority recruitment to dental schools? *J Dent Educ*. 2007;71:994-1008.
40. Weaver RG, Ramanna S, Haden NK, et al. U.S. dental school applicants and enrollees: 2003 and 2004. *J Dent Educ*. 2005;69:1064-1072.
41. U.S. Census Bureau. Summary data file for United States. Washington, DC: U.S. Government Printing Office; 2000.
42. Association of American Medical Colleges. AAMC statement on the physician workforce. Washington, D.C.: Association of American Medical Colleges; June 2006. <http://www.aamc.org/workforce/workforceposition.pdf>. Accessed November 3, 2008.
43. Saha S, Guiton G, Wimmers PF, et al. Student body racial and ethnic composition and diversity-related outcomes in US medical schools. *JAMA*. 2008;300:1135-1145.
44. Capozza K, Godstone, Susan, Jackson, Kimberly M. Literature review: diversity in the health professions. Los Angeles: California Endowment; March 2008. http://www.calendow.org/uploadedFiles/Publications/By_Topic/Culturally_Competent_Health_Systems/Workforce_Diversity/Lit%20Review%20Final3%2014%2008.pdf. Accessed November 13, 2008.
45. Association of American Medical Colleges. Table 27: total U.S. medical school graduates by race and ethnicity within sex, 2002-2007. Washington, DC: Association of American Medical Colleges; 2008.
46. Curtis JL. *Affirmative action in medicine: improving health care for everyone*. Ann Arbor, MI: University of Michigan Press; 2006.
47. Bergeisen L, Cantor JC. The minority medical education program. In: Issacs SL, Knickman JR, eds. *To improve health and health care 2000: The Robert Wood Johnson Foundation anthology*. San Francisco, CA: Jossey-Bass; 2000.
48. Cantor JC, Bergeisen L, Baker LC. Effect of an intensive educational program for minority college students and recent graduates on the probability of acceptance to medical school. *JAMA*. 1998;280:772-776.
49. Strayhorn G. Preadmissions programs and enrollment of underrepresented minority students before and during successful challenges to affirmative action. *J Natl Med Assoc*. 1999;91:350-356.
50. Summer Medical Dental Education Program, National Program Office. Summer Medical Dental Education Program. <http://www.smdep.org/history.htm>. Accessed November 16, 2008.
51. Terrell C. The Robert Wood Johnson Foundation's commitment to increasing diversity in the health professions. *Committee on underrepresented groups and the science and engineering workforce pipeline*. Washington, DC: National Academies; March 10, 2008.
52. Cohen JJ. A word from the president: reaffirming our commitment to diversity. *AAMC Reporter*. September 2000;9(12). <http://www.aamc.org/newsroom/reporter/sept2000/word.htm>. Accessed October 25, 2008.
53. Association of American Medical Colleges. Minority students in medical education: facts and figures XII. Washington, DC: Association of American Medical Colleges. 2002. <https://services.aamc.org/publications/showfile.cfm?file=version12.pdf&CFID=1934460&CFTOKEN=27e1178-d3de50c6-3715-4deb-b6b7-177b654ec649>. Accessed November 16, 2008.
54. Association of American Medical Colleges. AAMC's Project 3000 By 2000 announces new grants to prepare minorities for health professions careers: schools and programs of public health targeted for half of new grants. AAMC News Room: Press Release February 9, 1999. <http://www.aamc.org/newsroom/pressrel/1999/990209.htm>. Accessed November 5, 2008.
54. Carline JD, Patterson DG, Davis LA, et al. Enrichment programs for undergraduate college students intended to increase the representation of minorities in medicine. *Acad Med*. 1998;73:299-312.
56. Grumbach K, Coffman J, Gandra P, et al. *Strategies for improving the diversity of the health professions: The California Endowment*; 2003.
57. Cohen JJ. Finishing the bridge to diversity. *Acad Med*. 1997;72:103-109.
58. Jackson EW, McGlenn S, Rainey M, et al. MEDPREP—30 years of making a difference. *Acad Med*. 2003;78:448-453.
59. Rackley BP, Wheat JR, Moore CE, et al. The southern rural access program and Alabama's rural health leaders pipeline: a partnership to develop needed minority health care professionals. *J Rural Health*. 2003;19 (suppl):354-360.
60. Association of American Medical Colleges. *Learning from others: a literature review and how-to guide from the health professions partnership initiative*. Washington, DC: Association of American Medical Colleges; 2004.
61. Carline JD, Patterson DG. Characteristics of health professions schools, public school systems, and community-based organizations in successful partnerships to increase the numbers of underrepresented minority students entering health professions education. *Acad Med*. 2003;78:467-482.
62. University of Nebraska Medical Center, Office of Student Equity and Multicultural Affairs. NU-PATHS brochure. Omaha, NE; 2008.
63. University of Nebraska Medical Center, Rural Health Opportunities Program. http://www.unmc.edu/dept/rhen/index.cfm?L2_ID=-1&L1_ID=-1&L3_ID=10&CONREF=7. Accessed November 16, 2008.
64. The Alliance of Virginia & Nebraska. <http://www.vanealliance.com/index.php>. Accessed November 16, 2008.
65. Giles J. UNMC Looks for more physicians to work in underserved areas. *UNMC Today*. June 11, 2008. http://app1.unmc.edu/publicaffairs/today-site/sitefiles/today_full.cfm?match=4593. Accessed October 10, 2008.
66. D'Souza, D. *Illiberal education: the politics of race and sex on campus*. New York, NY: Free Press; 1991.
67. Herrnstein, RJ, Murray, C. *Bell curve: intelligence and class structure in American life*. New York, NY: Free Press; 1996.
68. Jacobs, LA. *Pursuing equal opportunities: the theory and practice of egalitarian justice*. New York, NY: Cambridge Press; 2003.
69. Grumbach K, Mendoza R. Disparities in human resources: addressing the lack of diversity in the health professions. *Health Aff (Millwood)*. 2008;27:413-422.
70. Cohen JJ. The consequences of premature abandonment of affirmative action in medical school admissions. *JAMA*. 2003;289:1143-1149.
71. Liaison Committee on Medical Education. Liaison committee on medical education accreditation standards. <http://www.lcme.org/standard.htm#latestadditions>. Accessed November 16, 2008.
72. Association of American Medical Colleges. <http://www.aspiringdocs.org/site/c.lulL9MUJtE/b.2011035/apps/lk/content3.aspx>. Accessed November 16, 2008.
73. American Dental Education Association. <http://www.explorehealthcareers.org/en/index.aspx>. Accessed November 16, 2008. ■