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 URM 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 underserved 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 academia, and its role in enhancing the health professional pipeline continues as an emotionally charged debate among academic medicine, the courts, policymakers, and the American public.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{1,6} In other words, URMs have a distinguishably different pattern of health care utilization...
in comparison to whites.\textsuperscript{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.\textsuperscript{12}

The disproportionately small 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.\textsuperscript{11}

Overall, high school completion rates for students aged 18 to 24 remained level from 1987 through 2006, at approximately 82\%.\textsuperscript{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.\textsuperscript{11}

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.\textsuperscript{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 preschool 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.\textsuperscript{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.\textsuperscript{15} By 2050, the US Census Bureau projections indicate that a majority of the US population, 54\%, will be from URM groups.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{16} In 2005, this was equivalent to an income of $39,342 for a family of 4.\textsuperscript{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).\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{18} Furthermore, race and gender power structures affect the ability of URMs to operate at different levels within our political, judi-

\begin{figure}
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\includegraphics[width=\textwidth]{Figure1.png}
\caption{Projected Population Distribution by Race and Hispanic Origin for the United States: 2050}
\end{figure}

\textsuperscript{Source: US Census Bureau, Population Division}
cial, educational, employment, and other systems. 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.

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. 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.

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. 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).

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

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. 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.

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-
son to their white peers (Tables 1 and 2). 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. 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. 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.

Workforce data from 2007 reveal that of 973,524 nonfederal 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.

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. 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.

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. 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. During the same period, whites and Asians/Pacific Islanders constituted 71.1% of all first-time dental school enrollees.

**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. Based on 2002 data, in which there were 16,488 new matriculants in allopathic medical schools, a 30% increase equated to approximately 4,946 new matriculants per year, or 21,434 new matriculants by 2015.

Despite research that points to the benefit of diversity in medical education such as improving cross-cultural, intellectual, and interpersonal benefits for all students, URMs continue to be disproportionately represented in medical schools in contrast to whites. 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.

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%. African Americans accounted for 6.9% of graduates in 2002 and 6.7% in 2007. Similarly, American Indians, who were fewer than 1% of graduates in 2001, remained static in 2007. 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.

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 5,205 in 2002 to 6,393 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 2,443 to 2,777, an increase of 14%, while the number of African Americans increased from 2,614 to 3,133, 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 2,317 in 2002 to 2,505 in 2007. This increase was largely accounted for by an increase in the number of
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.

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

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

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).\textsuperscript{56} Based on the MM EP evaluation, the SMDEP now focuses on rising sophomores and juniors.\textsuperscript{57,58} 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.\textsuperscript{59} Although the SMDEP structure is similar to the MM EP, 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.\textsuperscript{50}

In summary, since 1989, 16,575 students have participated in summer health-related career pipeline programs.\textsuperscript{41} According to 2008 AAMC data, 14,615 students participated in MM EP and SMEP.\textsuperscript{52} Of these participants, 61% or 8903, applied to medical school, and 64% or 5635 of participating students were accepted. The actual number of MM EP and SMEP students matriculating to medical schools was 98%.\textsuperscript{31} 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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{51} However, high school level math and science proficiency is considered an essential foundation for successful completion of university-level science and mathematics courses.\textsuperscript{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.\textsuperscript{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.\textsuperscript{52}

As a direct result of Project 3000 by 2000, the Health Professions Partnership Initiative (HPPI) was implemented in 1996.\textsuperscript{54} The HPPI was a collaboration between

<table>
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<th>Table 2. Race and Hispanic Origin of Matriculants to U.S. Medical Schools, 2002-2008</th>
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Note: Race data are presented only for those individuals selecting one category.
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.\textsuperscript{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.\textsuperscript{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 URM students to excel academically and advance through the pipeline, and developing internships for students.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{54,61}

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.\textsuperscript{52} 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.\textsuperscript{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-PATH 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. 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.

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.

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 POSTBACCALLAUREATE 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. 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. 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. 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 URM. 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. 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 enrollment 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.\(^4\)\(^8\)\(^9\)

- 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.\(^7\)\(^9\) 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.\(^6\)\(^0\)

- Academic preparation programs must start early, be intensive, and persist throughout schooling.\(^5\)\(^0\)
- 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.\(^6\)\(^0\)
- 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.\(^6\)\(^0\)
- 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.”\(^7\)\(^5\) 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.\(^7\)\(^1\)

- 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”\(^7\)\(^2\) and ExploreHealthCareers.org\(^7\)\(^3\) 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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