Breaking Barriers for Underrepresented Minorities in the Health Professions

by Christopher Toretsky, Sunita Mutha, and Janet Coffman
Healthforce Center at UCSF

July 2018

Contents

Acknowledgment

Funding for this project was provided by The California Wellness Foundation.

Executive Summary

California is one of the most racially and ethnically diverse states in the United States. In fact, racial and ethnic minorities are now the majority in California, with the proportion of Latinos now surpassing Whites.[1] However, non-White groups – namely, Latinos, African-Americans, and American Indians – are underrepresented in health professions that require an undergraduate or graduate degree. This issue brief summarizes known barriers to increasing the numbers of underrepresented minorities (URMs) in health professions, presents a framework for recruitment, retention, and successes of URM health professions trainees, and provides examples of strategies for increasing the number of URM health professions trainees in California. The barriers to entering the health professions include:

- The cost of education
- Lack of academic preparation; admissions requirements, especially for doctoral degree programs
- Lack of concordant mentors
- Stereotype threat
- Limited exposure to health careers
- Poor advising.

An adaptation of the Initiative to Maximize Student Development framework is presented as a way to organize strategies for successful recruitment, retention, and advancement of URMs in health professions. The framework's three categories are:

1) Forming institutional partnerships,
2) Providing tailored student support / academic success, and
3) Engaging faculty / institutional change

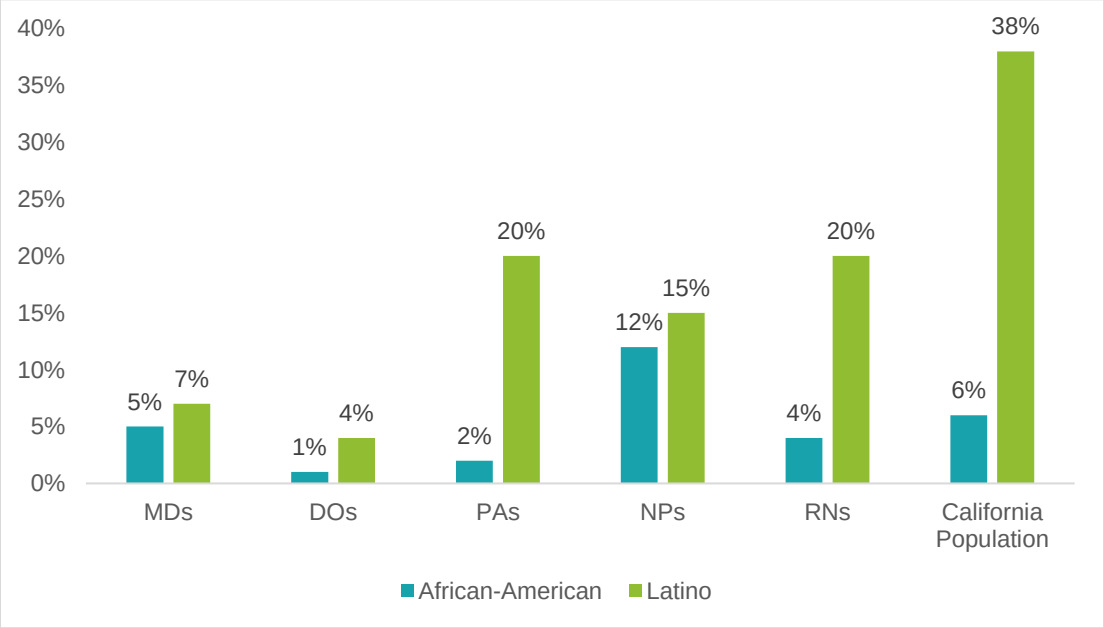
We use this framework to organize the multitude of strategies uncovered through literature review and interviews. Examples of specific and detailed strategies for overcoming the barriers are summarized in Table 1 on page 13.

Implementing strategies that encompass all elements of the framework is critical to increasing the numbers of URMs in the health professions. Institutional partnerships are essential to provide young URMs with the knowledge and confidence to pursue health professions education. Tailored academic, financial, and psychosocial support enable students to maximize their potential. Institutional change is perhaps the most difficult part of the framework to implement, but it is also the most important. Health professions schools need leaders who are willing to invest institutional resources to increase racial/ethnic diversity and to guide faculty in implementing holistic procedures for reviewing applications for admission and creating a climate of inclusion.

Introduction

California is one of the most racially and ethnically diverse states in the United States. In fact, racial and ethnic minorities are now the majority in California, with the proportion of Latinos now on par with Whites.[1] However, non-White groups – namely, Latinos, African-Americans, and American Indians – are underrepresented in most health professions that require an undergraduate or graduate degree. As the data displayed in Figure1 indicate, Latinos account for 38% of Californians, but only 7% of medical school graduates and only 20% of graduates of registered nursing (RN) education programs. Underrepresented minorities (URMs) play critical roles in the health care field because they may often speak patients' languages and relate to them on both cultural and socio-economic levels. Prior research has shown that patient-physician concordance of race, language, and social characteristics strengthen the patient-physician relationship through higher levels of trust and satisfaction during the patient's office visit.[2,3,4]

Figure 1. Graduates of MD, DO, PA, NP, and RN Training Programs by Race/Ethnicity, California, 2015



Source: Association of American Medical Colleges, American Association of Colleges of Osteopathic Medicine, Integrated Post-secondary Education Data System, American Association of Colleges of Nursing, California Board of Registered Nursing.

Due to the large chasm between the racial/ethnic mix of health care professionals and the racial/ethnic mix of people who need health care services, California needs to implement changes within the health care education pipeline that would help mitigate this gap. Barriers to increasing the number of URMs in health professions need to be recognized and comprehensive strategies must be implemented to address them. Thus, the purpose of this policy brief is threefold:

1) Summarize the literature on barriers to increasing the numbers of URMs in health professions that require undergraduate or graduate degrees;

2) Present a comprehensive framework for recruitment, retention, and success of URM health professions trainees, and

3) Explore strategies for increasing the number of URM health professions trainees that could be implemented more widely in California.

This policy brief specifically looks at strategies for increasing the number of URM health professionals that can be implemented at the Associate, Bachelor's, Master's, and Doctoral degree programs. Post-baccalaureate and other "bridging" programs were also considered. While work at the K-12 level to increase the number of URMs who pursue higher education in health professions is important, it is beyond the scope of this policy brief.

Methods

Literature reviews and key informant interviews were utilized to address these three topics. The literature review focused on barriers to and facilitators of increasing the number of URMs in health professions. Key informant interviews were conducted telephonically and included both thought leaders in health professions diversity and leaders of institutions or programs aimed at increasing the number of URM health professionals. Interviews lasted approximately one hour and were recorded and transcribed for accuracy. In total, we interviewed 12 stakeholders who represented 11 unique programs in California, Massachusetts, and Washington, D.C.

Results

Barriers to Increasing the Number of Underrepresented Minorities in the Health Professions

Financial Cost of Health Professions Education

One prominent barrier identified during the literature review and interviews is the monetary cost of entering the health professions, regardless of the URM's program or pathway. Financial challenges are even more pronounced for URMs than other racial/ethnic groups as they are more likely to have lower socio-economic status. According to the latest Census Bureau data, the 2016 median income for non-Latino White households was $65,041, whereas Black and Latino households had median incomes of $39,490 and $47,675, respectively.[5] According to the Sullivan's Commission's report on minorities in the health professions, the federal government's Advisory Committee on Student Financial Assistance estimates that 48 percent of academically qualified low-income students do not attend four-year colleges because of financial barriers.[6]

URM students, similar to other health professional students, must often rely on student loans to finance their education. However, the amount of debt among URM students in medicine is especially large. In 2015, 35.8% of White matriculants to U.S. medical schools had premedical school debt (i.e., debt related to their undergraduate education) compared to 46.2%, 46.3%, and 62.1% for American Indians, Latinos, and African-Americans, respectively.[7] The median amount of debt for all medical students was $190,000 in 2016.[8]

One major driver of the overall cost of education, and consequently debt, is the length of education. For example, students aspiring to become physicians spend their undergraduate years (usually four) taking pre-med courses, followed by four years of medical school, and another three to seven years in residency training (with additional time for fellowship).[9] Thought leaders have concluded that medical training can be reduced by roughly 30% without compromising physician competence of quality of care.[10] In addition to debt burden, prolonged training also has an impact on opportunity cost because of the delay in beginning employment and entering the workforce.

Lack of Academic Preparation

Lack of academic preparation is a persistent challenge for URMs at both undergraduate and graduate levels. Most health professions, such as nursing, medicine, and dentistry require students to complete a suite of classes at the undergraduate level in the fields of math and sciences to be eligible to enroll in an undergraduate major or a graduate level program (i.e., "gateway courses"). URMs often receive lower grades in these courses because they are not as well prepared as their classmates.[11] Their schools have fewer resources to recruit and retain strong teachers and operate science laboratories. Several interviewees indicated that URMs from rural areas face even greater challenges than URMs from urban areas because science classes in rural schools are often not as rigorous. These gateway courses have also been shown to cause students to lose interest in careers in medicine.[12,13] Specifically, organic chemistry is one course cited several times in the literature and during the interviews as being problematic for URM students. At many universities, these courses enroll large numbers of students and course instructors do not provide much support for struggling students. URM students also may not know about or use academic support services that are available to them.

Many California high school students have also not taken college preparatory courses (known as the a-g courses) that are required for students to be admitted to California State University or the University of California.[14] Only 45% of the students in the graduating class of 2016 completed these courses. Success in the a-g math sequence is an important indicator of a student's readiness to take the college-level math courses (e.g., calculus) that are required by health profession schools. African-American and Latino students have higher attrition rates in the a-g math sequence in part due to non-academic factors such as school placement policies and course counseling.[14]

Completing prerequisites is particularly challenging for URMs who enroll in community colleges. One of the more salient recommendations by the Sullivan Commission is that "community colleges represent a valuable resource for recruiting minority students to four-year colleges and ultimately to nursing, medical, and dental schools (pg. 77).[6] But, URMs pursuing a health profession degree who first start at a community college before transferring to a four-year college face two significant barriers: lack of articulation agreements between schools (i.e., the student has to repeat courses) and lack of "bridging programs" that provide academic and psycho-social support for transfer students. California is no exception. Only 4% of students enrolled in the California community colleges system were able to transfer to a four-year university within two years of enrollment, only 25% transferred within four years of enrollment, and only 38% within six years of enrollment.[15] California ranks last in access to four-year universities.[15] However, the state has made incredible progress in rectifying the issue by passing the Student Transfer Achievement Reform (STAR) Act (Senate Bill 1440), and its later expansion through Senate Bill 440. Senate Bill 1440 requires community colleges to establish Associate Degree for Transfer programs and requires California State University campuses to accept students who obtain an Associate Degree for Transfer with junior standing and SB 440 expanded the range of subjects in which Associate Degrees for Transfer must be offered. According to the Campaign for College Opportunity, the number of community college students earning Associate Degrees for Transfer has nearly doubled every year since Senate Bill 1440 became law. In addition, Latinos are better represented in this program than they are in the general California State University transfer population.[15]

Admission Requirements

Admission requirements are a major challenge for URMs interested in medicine, dentistry, and other professions that require a doctoral degree. The University of California Regents' decision to prohibit consideration of race/ethnicity in admissions and the subsequent enactment of Proposition 209, which amended California's constitution to prohibit consideration of race/ethnicity in admissions to all public educational institutions, were associated with substantial reductions in the numbers of URMs admitted to health professions schools. Although the number of URMs admitted to health professions schools has since rebounded, many schools still place great emphasis on high GPAs and scores on admissions tests (e.g., Medical College Admission Test (MCAT) and

Dental Admissions Test (DAT)). URMs who are not well-prepared for college often have lower GPAs in prerequisite courses and many cannot afford to pay for admission test preparation courses that their peers take to maximize their scores. Moreover, interviewees expressed that some URM applicants also struggle with requirements to write essays and complete interviews, which can make it difficult for them to convey their interests and abilities to admissions committees.

Even if URMs do achieve a high GPA and score well on their admissions tests, often times they are unable to enroll in their preferred major or program because the major/program is "impacted" (i.e., the number of students eligible to enroll exceeds the number of students the major or program can accommodate). These impacted majors and programs often make students wait up to 1-2 years before enrolling, even after completion of prerequisite courses. Understandably, some students do not want to wait this long and will choose another field that allows them to continue their education without delays. This has been an issue for nursing programs[16] and respiratory therapy programs, to name just a couple.

Lack of Mentors Concordant with Student's Race/Ethnicity

Another key barrier for URMs is lack of mentors who are racially or ethnically concordant. This has been observed among students in several health professions: dentistry,[6] including dental hygiene,[16] nursing,[6,17-18] maternal and child health;[19] and medicine.[6] Previous research has shown the importance of peer mentorships for all university students;[20] however, peer mentoring is especially critical to providing a welcoming and inclusive atmosphere for URMs. URM students also need faculty mentors, but often lack them because there are few minority faculty in health professions schools.[21] An interviewee stressed the importance of this: "One thing medical school is good at is beating you up…if you have mentors that look like you, it's a sign of hope and is very powerful."

Lack of racially/ethnically concordant mentors may also make it difficult for students to seek advice on how to balance academic demands with activism. Some URM pre-health and health professions students are active in Black Lives Matter and other social movements because they feel it is important to advocate on behalf of their communities. They may feel conflicted about taking time away from activism to study for classes and standardized tests.

Stereotype Threat

URMs also face what psychologists call "stereotype threat." In short, URMs who attend university do so with an added burden of possibly being viewed by professors and peers through the lens of negative stereotypes about their capabilities, and the fear of living up (performing down) to that stereotype. For example, an African-American student taking a test under stereotype threat might continuously reread questions and recheck answers, in effect trying "too hard" to test perfectly and quell myths that he/she does not belong in that exam room. But, this over-thinking during the test for fear of confirming the stereotype paradoxically does just that.[22] Stereotype threat is a multi-dimensional barrier found at all degree levels and manifests in many forms throughout the educational continuum, including performance on standardized entrance exams and classroom exercises, and in university social settings. A member of the Sullivan Commission, Dr. Geraldine Bednash, former Executive Director at the American Association of Colleges of Nursing, went so far as to articulate the concern that talented Native Americans are guided only to two-year college programs because of "diminished expectations" that are "societal and maybe even cultural."[6]

Limited Exposure to Health Care Careers

Several interviewees cited lack of exposure to health care careers as an important barrier to increasing the number of URMs in the health professions; as one interviewee put it, "You can't be what you can't see." Many

URMs come from socially and economically disadvantaged backgrounds and may not have any health professionals in their families or their families' social networks. Some are the first persons in their families to go to college. They may only come in contact with health professionals when they or other members of their families need care and the health professionals they encounter may be of other race/ethnicities. URMs may not explore health care fields other than medicine or nursing because they are unaware of these career opportunities.

URMs from socially and economically disadvantaged backgrounds may also have difficulty accessing internships that can be critical to obtaining admission to health professions education programs, particularly at the graduate level. They may not be aware of the importance of completing clinical, public health, or research internships. Even if URMs are aware, they may not know how to find internships. URMs may also have difficulty completing internships unless they are paid because they need to earn income to pay for their education and, in some cases, support their families.

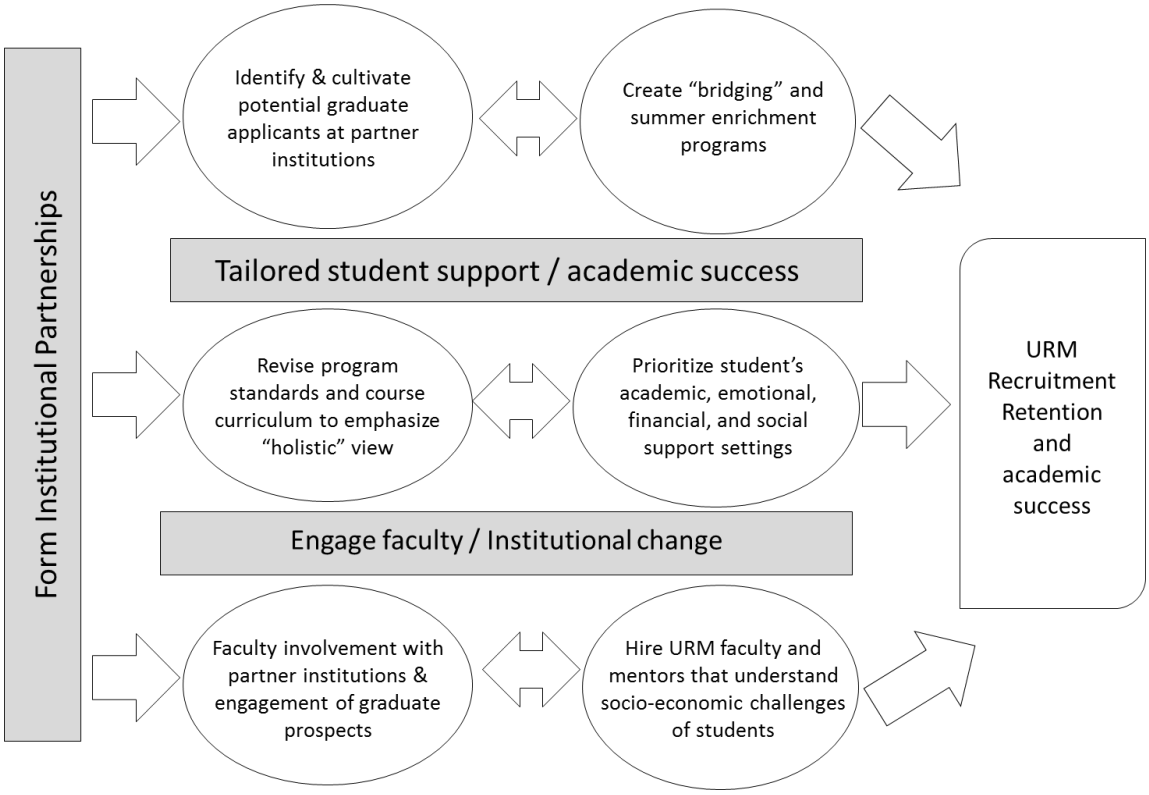
Poor Advising

Lack of exposure to health careers outside the classroom may make URMs more dependent on advisors at their universities. Resources for advising are often limited and career centers at colleges often do not have expertise in health care careers. Students who are able to meet with advisors may receive poor advice. Some advisors may discourage students who receive poor grades in introductory science courses from pursuing admission to medical or dental school instead of helping them improve their performance. One interviewee also noted that some universities could do a better job of helping students prepare applications for professional school and advocating for their admission.

A Framework to Successfully Recruit and Retain URMs in Health Professions

Several studies have looked at the mechanisms that help recruit and retain URMs in health professions education. While most of the research to date looks at medical[23-28] and dental schools,[29-34] other health professions have been studied such as nursing,[18] maternal and child health,[19] pharmacy,[35] and public health.[36] Moreover, there is a substantial body of literature looking at recruitment and retention strategies for URMs in science, technology, engineering, and math (STEM) subjects. One framework for conceptualizing these strategies was developed by Brown University's Initiative to Maximize Student Development (IMSD) for students pursuing a PhD in one of 19 graduate programs across the university.[37] Since similar ideas emerged in the health professions literature, we have adapted the IMSD schematic[38] (see Figure 2 below) to describe a framework for developing programs that successfully recruit, retain, and further the advancement of URMs in health professions education.

Figure 2. Framework for URM Recruitment, Retention, and Academic Success in the Health Professions



Form Institutional Partnerships

The framework in Figure 2 encompasses three broad categories of goals. The first category, forming institutional partnerships, is the cornerstone of the framework. The framework contains two other categories of goals – tailored student support / academic success and engage faculty / institutional change. The framework also contains corresponding practices (described within the ovals).

In successful institutional partnerships, all institutions involved share one common goal: recruiting and retaining URMs in the health professions. This mission statement needs to be clearly articulated at all partner institutions and needs to be central to all decision making. Moreover, it needs to have both top-down (e.g., at the administrator, director, and president/dean roles) and bottom-up (e.g., faculty positions) input and support. Buy-in at both levels is essential to streamline the design, implementation, and communication about joint activities. Specific practices of educational partnerships include:

- Identifying and nurturing potential applicants to professional school
- Creating "bridging" or summer enrichment programs
- Coordinating curriculum, methods for delivering curriculum, means of assessing students, and performance standards

Tailored student support / academic success

Tailored student support / academic success is the second strategy within the framework, and has the capacity to address all barriers discussed above. The extent to which these barriers are rectified is largely dependent upon the institution's or program's commitment. One of the framework's key components under this strategy is to "prioritize student's academic, emotional, financial, and social support settings." Although best practice involves addressing all four of these domains, anecdotal evidence suggests adopting even just a subset of these four types of student support services is better than not adopting any of them.

Examples of specific activities in each of these domains include:

- Academic support: Tutoring, admissions test preparation, summer enrichment programs
- Emotional support: Access to counseling services, workshops for families
- Financial support: Scholarships, paid internships, loan repayment, assistance with child-care and transportation
- Social Support: Peer, faculty, alumni, and community mentorships

Revising program standards and course curricula to take on a more holistic view of the student is beneficial for both the institution and student body. Institutions that base admission decisions primarily on a student's GPA and standardized test scores rely too heavily on quantitative metrics that often times do not fully measure how successful a student will be as a scholar or a health professional.[39,40,41] Other metrics such as an applicant's personal statement, volunteer work, and their "distance traveled" – a measure to assess where/how far an applicant has come from to get to where he/she is now – should also be considered in order to admit a more racially/ethnically, culturally, and financially diverse group of students.[42,53] This diversity ultimately leads to a more dynamic and vibrant cohort of students whose views and upbringings are multifaceted and can help provide insights to a broader spectrum of health care needs of populations. For example, students from underserved communities are more likely to serve in those communities upon graduation,[26] which can improve access to care in these historically neglected communities. There is value within the classroom as well. Since personal experiences are instrumental in how one views any situation, having a classroom comprised of students with similar backgrounds increases the likelihood of a narrow and limited discussion about any topic. A racially/ethnically and socio-economically mixed group offers a broader and more nuanced understanding of a situation, which can translate to more empathetic and compassionate health care delivery.

Engage faculty / Institutional change

As previously stated, engaging faculty to spearhead the formation of institutional partnerships is essential; it is also a requisite to implementing institutional change and serves as the third strategy of the framework. Engaging faculty to foster institutional change begins by hiring a racially/ethnically diverse faculty that understand the socio-economic challenges of URM students the institution is trying to recruit and retain. Only in so doing, can the program begin to provide students with mentors who are concordant with students' race/ethnicity and mitigate stereotype threat.

The extent to which barriers to enrollment of URMs are reduced largely depends on the institution's (and faculty's) willingness and ability to expand faculty members' job responsibilities to encompass mentoring underrepresented students and to hire staff to support them in carrying out this work. Faculty mentors help inspire and motivate students by introducing them to various health careers and research areas that the students may not have known existed or were available to them. A racially/ethnically diverse faculty can also demystify the notion that URMs do not belong in health professions, which can reduce the likelihood that stereotype threat will occur.

Regularly scheduled and ongoing interactions between faculty and administrators at partner institutions are essential practices in developing and maintaining the most optimally designed curriculum for URM students.

Involving faculty and administrative leaders at all partnered institutions enables courses, and their respective curricula, to be efficiently designed and operationalized to facilitate a smooth transition of URM students from one educational institution to another. Specifically, involvement by faculty and administrative leaders considerably reduces the odds that students have to unnecessarily repeat lectures, assignments, and entire courses. Moreover, faculty and administrative leaders at all partner institutions can share and shape "best practices" as they pertain to the student's learning preferences, which provides students with the greatest chance of academic success.

Specific Strategies for Increasing the Number of URMs in Health Professions

An overview of specific strategies to increase the number of URMs in health professions is shown in the table below. The strategies are grouped according to the aforementioned framework's six key practices (indicated by the ovals). This list is not meant to be exhaustive, but rather serves to highlight some unique programs, whose features are briefly described at the end of this section. Furthermore, several programs incorporate more than the one key practice, but are only listed once for simplicity. For more details about any strategy, please consult the program's website, whose link can be found in the References section of this policy brief.

Identify and Cultivate Potential Applicants

URMs who are interested in health care careers are often from disadvantaged backgrounds and lack access to information about educational requirements and career planning that students from more affluent backgrounds obtain through their social networks. For example, URMs who begin their college careers at community colleges may not be aware of requirements for transferring to a four-year college or for admission to professional school. Health professions schools in California and other states are addressing this challenge by partnering with community colleges and four-year colleges with large numbers of URM students to enhance the knowledge and preparation of URM students interested in health care careers.

Bridges to Baccalaureate: A grant program funded by the National Institutes of Health (NIH) that aims to increase the number of community college students who obtain doctoral degrees in the biomedical sciences and participate in NIH-funded research. Partnerships are formed between community colleges and colleges and universities that grant bachelor's degrees, have strong science curricula, and have a track record of graduating students who pursue doctoral degrees in biomedical research fields. Grant funds can be used to support student, faculty, and institutional development activities. There are 12 Bridges to Baccalaureate partnerships in California that involve community colleges and either California State University or University of California campuses.[43] Although Bridges to Baccalaureate is not focused on underrepresented students per se, participating institutions in California enroll large numbers of underrepresented students, some of whom may be interested in pursuing doctoral degrees in health professions.

Center for Community College Partnerships (CCCP) at UCLA: A partnership between University of California Los Angeles (UCLA) and California community colleges that works to increase transfer rates and increase the success of underserved community college populations (first generation, low-income, and/or underrepresented racial/ethnic groups) by providing students with skills and knowledge of available transfer pathways. Part of CCCP's mission is to create strong academic support programs that improve each student's academic preparation and competitiveness for admission to UCLA, with a central aim of increasing diversity of UCLA's transfer admit pool.[44] Although CCCP does not focus exclusively on students interested in careers in health care, CCCP participants who are interested in health care are better prepared to succeed in pre-health professions classes if they transfer to UCLA.

Texas's Joint Admission Medical Program (JAMP): This is a network of participating universities in Texas. To date, partnerships between nine medical schools and 67 public and private four-year undergraduate institutions have been created. The program is directed towards increasing the number of highly qualified, economically

disadvantaged students who pursue medical education.[45] Components of the program include mentoring, scholarships, summer internships, and preparation for the MCAT. Students who meet eligibility requirements are guaranteed admission to a Texas medical school.

Table 1. Examples of Strategies for Overcoming Barriers

Form Institutional Partnerships	
Identify and Cultivate Potential Graduate Applicants at Partner Institutions	**Create "Bridging" and Summer Enrichment Programs**

• Bridges to Baccalaureate
  ○ San Francisco State University
  ○ UC Riverside
• Texas's Joint Admission Medical Program
• UCLA's Center for Community College Partnerships
	• FastStart at the UC Riverside School of Medicine
	• Summer Health Professions Education Program by Robert Wood Johnson Foundation
	• Medical Education Development Program at University of North Carolina School of Medicine
	• Bridge to Dentistry at Texas A&M Health Sciences Center College of Dentistry

Tailored Student Support / Academic Success	
Revise Program Standards and Course Curriculum to Emphasize "Holistic" View	**Prioritize Student's Academic, Emotional, Financial, and Social Support Settings**
• UC Health Programs in Medical Education (PRIME) • Charles R. Drew University of Medicine and Science • Sophie Davis Biomedical Education Program at CUNY School of Medicine • Icahn School of Medicine at Mount Sinai • Accelerated Competency-Based Education in Primary Care (ACE-PC) program at UC Davis School of Medicine • Implicit Associations Test by Project Implicit • UC Davis Distance Travelled Tool	• City University of New York Start model for remediation • Xavier University • Academic Advancement Program at UCLA • Medical Scholars Program at UC Riverside • UC San Francisco (UCSF) Fresno Medical Education Program • Medical/Dental Education Preparatory Program at Southern Illinois • University of California Post-baccalaureate Consortium • Biology Scholars Program at UC Berkeley • Tour for Diversity in Medicine • DiverseMedicine
Engage Faculty / Institutional Change	
Faculty Involvement with Partner Institutions and Engagement of Graduate Prospects	**Hire URM Faculty and Mentors that Understand Socio-economic Challenges of Students**
• Communities of Practice at UC Davis School of Medicine	• Health Career Connection • Underrepresented in Medicine mentoring program and dinners at UCSF • PROF-PATH Program at UCSF

Create "Bridging" and Summer Enrichment Programs

A number of health professions schools across the United States have established summer enrichment programs for underrepresented and disadvantaged college students. The goal of these programs is to provide undergraduates with experiences and knowledge that will enhance their ability to become physicians, dentists, and other types of health professionals that require graduate level education.

Summer Health Professions Education Program (SHPEP): Directed towards students who identify as African-American, American Indian, Alaska Native, and Latino, and who are from communities of socio-economic and educational disadvantage, SHPEP is a free summer enrichment program focused on improving access to information and resources for college students interested in the health professions. SHPEP is hosted at 13 institutions nationwide (two programs are within California: UCLA/Charles R. Drew University and Western University of Health Sciences), with funding by the Robert Wood Johnson Foundation (RWJF) and direction and technical assistance provided by the Association of American Medical Colleges (AAMC) and the American Dental Education Association (ADEA).[46] Components of SHPEP include academic enrichment in the basic sciences, learning and study skills, clinical rotations, career development, financial planning, and opportunities for inter-professional education.

In addition to SHPEP, a number of health professions schools operate their own summer enrichment programs for underrepresented and disadvantaged students interested in health professions careers.

FastStart at the UC Riverside School of Medicine: Offered exclusively to incoming first-year UC-Riverside students from disadvantaged backgrounds who want to pursue a medical or science-based career. FastStart is a five-week long program that consists of classes, workshops, and activities to help equip the students with the tools necessary for a successful start to their college experience.[47] Students who participate in FastStart may go on to participate in UC Riverside's Medical Scholars program, a comprehensive academic support program for college students who wish to become health professionals.

Medical Education Development (MED) Program at UNC School of Medicine: Established in 1974, the nine-week summer enrichment program at the University of North Carolina (UNC) offers a summer curriculum to increase the ability of advanced pre-health professions students, especially those who are disadvantaged, to compete successfully for admission to health professional schools. The curriculum encompasses courses in the basic sciences, experiences with patient simulation, preparation for medical and dental school admissions tests, and exploration of the admissions process. Participants receive housing and a stipend. Since the program's inception in 1974, of the over 3,000 attendees who decided to apply to professional schools, 92% were accepted and matriculated into medical, dental, and other allied health professional schools.[48] A previous study has shown that graduates of this program have successfully earned an MD degree despite having significantly lower MCAT scores and undergraduate GPAs.[49]

Bridge to Dentistry at Texas A&M Health Sciences Center (TAMHSC) College of Dentistry: Prepares students from underserved communities to enhance their competitiveness for admission to dental school. The program encompasses summer enrichment programs for high school and college students. Components of the summer program for college students include courses to strengthen knowledge of basic sciences, clinical rotations, hands on experiences with dental materials, exposure to problem-based learning, study skills, preparation for the dental school admission test, and admission counseling. To date, the program has graduated more than 90% of students from all ethnic and racial groups.[50]

Revise Program Standards and Course Curriculum

Health professions schools in California have implemented several different types of initiatives to revise admissions procedures and the manner in which students are educated.

Implicit Bias Training

Implicit biases held by members of admissions committees can exacerbate underrepresentation in health professions schools. Admissions committee members may hold attitudes and beliefs that lead them to discount the accomplishments of students from underrepresented backgrounds. Implicit bias training can help admissions committee members identify their biases and limit their reliance on them.

Implicit Associations Test (IAT) by Project Implicit: IAT is a test designed to shed light on implicit attitudes and beliefs that one may not know they hold. In effect, the test measures the strength of associations between concepts and evaluations or stereotypes.[51] All 140 members of the Ohio State University College of Medicine (OSUCOM) admissions committee were required to complete the test; the class that matriculated following this requirement was the most diverse in OSUCOM's history.[52]

De-emphasizing Scores on Standardized Tests Relative to Other Criteria

Traditionally, health professions schools place substantial weight on scores on standardized admissions tests when evaluating applicants. We identified several examples of medical schools that have de-emphasized scores on standardized tests relative to other criteria to increase the diversity of students.

Distance Travelled Tool by University of California, Davis: The UC Davis's admissions committee uses a tool to assess qualified applicants more holistically by going beyond the usual quantitative metrics (e.g., MCAT score and GPA) used by medical schools. The tool accounts for where or how far an applicant has come from to get to where students are now. Specifically, it accounts for the cumulative life experiences of an applicant and credits the socio-economic disadvantages accordingly. The tool has gone through validity testing and has been shown to fairly adjust an applicant's socio-economic disadvantage.[53] Use of this tool could help health professions schools better assess the potential of applicants from disadvantaged backgrounds.

Charles R. Drew University of Medicine and Science: A private, nonprofit, university committed to developing diverse health professionals. Since 2000, 70% of the graduates came from underrepresented backgrounds. The University's curriculum is based on five specific pillars – research, social justice, international exposure, experiential education, and health policy.[54] The admissions committee tries not to put undue weight on a candidate's MCAT, and instead, takes a holistic review of the application. The university considers other factors (e.g., demonstrated commitment to caring for underserved persons) to be equally important in selecting students and may choose a student from a disadvantaged background who has extensive work or volunteer experience with underserved populations over an applicant who has a higher MCAT score, but with little evidence of interest in caring for underserved populations. As one interviewee put it, "Standardized tests are part of being a health professional." From this interviewee's perspective, admissions committees should consider MCAT scores on standardized tests in addition to other factors because the scores provide some indication of an applicant's ability to pass examinations required for licensure.

Donald and Vera Blinken FlexMed Program at Icahn School of Medicine at Mount Sinai: The program permits college sophomores in any major to apply for early acceptance. Once accepted, a student can take any courses during the remaining two years of his/her undergraduate program and is exempt from having to take the MCAT. Students who have not taken organic chemistry and biochemistry prior to matriculation are required to participate in a Summer Enrichment Program, which provides students with a basic understanding of Cell and Molecular Biology, Biochemistry, and Organic Chemistry.[55] Research has shown that medical students enrolled in

this model performed at a level equivalent to those who had enrolled in a "traditional" premedical program.[56] Although this program does not specifically aim to increase enrollment of URMs, it offers an alternative to the traditional reliance on MCAT scores and grades in traditional pre-medical courses for selecting applicants.

Cohort Models

Many health professions schools focus recruitment efforts on students from underrepresented and disadvantaged backgrounds as well as students with a demonstrated interest in caring for underserved populations. Some schools also have "cohort" programs in which a subset of students in each class who share an interest in care for underserved populations complete specialized coursework and clinical experiences aimed at preparing them for practice in underserved communities. These students are linked to physician mentors who practice in underserved communities. These "cohort" programs also provide like-minded students, many of whom are from underrepresented or disadvantaged backgrounds, with a network of supportive peers.

University of California Programs in Medical Education (PRIME): One of the largest examples of the "cohort" model is the University of California's Programs in Medical Education (PRIME). Now offered by six UC campuses, PRIME offers specialized coursework and structured clinical experiences with underserved populations in both rural communities and urban areas. Each of the PRIME programs is tailored to the populations served by each of the school and affiliated medical centers. Students admitted to the program must share a strong commitment to working with the populations served.[57] Although PRIME admits students from all racial/ethnic backgrounds and socio-economic backgrounds, many PRIME students are underrepresented persons from disadvantaged communities.

Accelerating Education

Reducing the length of health professions education is one means for reducing the financial burden associated with health professions education. A number of medical schools offer combined BS/MD degree programs that can be completed in six or seven years instead of the traditional eight years (four years of college plus four years of medical school). These combined programs can be a good option for undergraduates who are certain they want to become a physician. A few programs, most notably the Sophie Davis Biomedical Education Program at City University of New York, focus on recruiting students from underrepresented backgrounds who plan to pursue careers in primary care.

Sophie Davis Biomedical Education Program: Sophie Davis is a combined BS/MD program with a commitment to increase the number of physicians who have been historically underrepresented in the medical profession. The program emphasizes producing primary care physicians who have a strong grounding in public health. The curriculum enables students to complete both their degrees in seven years and the MCAT is not a requirement for the admissions process.[58, 59]

Another model of accelerated education that is gaining popularity is the accelerated medical school. At least 13 medical schools in the United States and Canada have accelerated programs in which students complete medical school in three years instead of four. Some accelerated programs focus on preparing students for careers in primary care, whereas others admit students interested in multiple specialties. At least one accelerated program prioritizes admission of students from underrepresented and disadvantaged backgrounds.

Accelerated Primary Care (ACE-PC) at UC Davis School of Medicine: In partnership with Kaiser Permanente Northern California, the program allows students interested in primary care careers to complete medical school in three years. Preference for admission is given to persons who have experience in primary care or community health, speak a language other than English, are the first in their family to obtain a bachelor's degree, or graduated from a high school in a county in Northern California served by Kaiser Permanente. This program enrolls six students per year, two-thirds of whom are underrepresented minorities and/or socio-economically

disadvantaged.[60] Persons in the program's first cohort are now in their first year of residency and preliminary reports suggest that their clinical performance exceeds that of peers from traditional four-year medical schools, a finding that is consistent with the experience of other accelerated medical school programs in the US.

Prioritize Students' Academic, Emotional, Financial, and Social Support Settings

Many underrepresented students interested in careers in the health professions need additional academic, emotional, financial, and social support to achieve their goals. Many attended high schools that did not prepare them adequately for college. Many also struggle to pay for their education and, in some cases, financially support other family members. Even those who have strong preparation and sufficient financial resources may struggle emotionally and socially in college if they do not feel that they belong in college.

Remediation

Many high school graduates from underrepresented backgrounds are not adequately prepared for college and are required to complete remedial classes. Some students struggle in these courses and drop out or take much longer than average to finish college. Some colleges and universities are beginning to rethink how they serve students who need remediation.

City University of New York (CUNY) Start model of remediation: Through intensive preparation in reading, writing, and math, the goal of the program is to help students prepare for college-level coursework and reduce any remedial needs prior to students entering CUNY.[61] The teachers and curriculum focus on "thinking, not memorization" and the school provides students with counseling services as an extra layer of support.[62]

The California State University has also pledged to change its approach to remediation, but it is too early to ascertain the impact of these changes.

Comprehensive Support Services

A number of colleges and universities in California and other states provide academic, emotional, financial, and/or social support services to students from underrepresented and disadvantaged backgrounds who are interested in health care careers.

Xavier University: For students interested in a health profession, Xavier University offers a suite of support services, including: group and individual meetings with a premedical adviser; guidance in choosing courses to maximize competiveness for acceptance into health professional schools; preparation for medical school, dental school, and other admissions tests.[63] Xavier is also a small university where students receive more individual attention from faculty than they often do at larger universities.

Academic Advancement Program (AAP) at UC Los Angeles: In order to administer innovative academic programs for URMs, AAP provides services such as peer tutoring; academic, personal, and career counseling; graduate and professional school mentoring; and scholarships.[64]

Biology Scholars Program at UC Berkeley: This program is aimed at URMs, women, and students from low-income backgrounds and/or the first in their family to attend college. Over the past 20 years, these groups have made up 60%, 70%, 80% of the program's 2,080 graduates, respectively. Furthermore, the program de-emphasizes the SAT and GPA as predictors of success and instead looks for students who possess characteristics such as resilience, a passion for science, and authenticity. [65] In addition to meeting minimum academic standards, program members must also meet periodically with an advisor, complete program surveys, attend study groups, and other activities that illustrate their motto, "you get out of it what you put into it."[66] Research has shown that minority students in the program graduate with a biology degree at a significantly higher rate than minority students not in the program. Data also show that minority students in the program graduate with significantly higher GPAs than students with similar backgrounds not in the program.[67]

Medical Scholars Program at UC Riverside: The program provides support for students in professional and career development (career planning workshops, community, and service opportunities), research opportunities (eight-week full-time paid summer internships with UC Riverside faculty and part-time academic year research program), and academic support (academic coaches for science and math classes, faculty and staff mentors and advisors, and advising nights).[68]

UC San Francisco Fresno Medical Education Program Partnership with California State University Fresno: A partnership between the UCSF Fresno Latino Center for Medical Education and Research and California State University Fresno (Fresno State) that provides educationally or economically disadvantaged Fresno State students interested in medicine, dentistry, pharmacy, or allied health an opportunity to become competitive applicants to health professional schools, and ultimately become healthcare professionals in the Central Valley and provide care to the underserved. Students enrolled in the program receive priority enrollment in math and science courses, a summer program that provides clinical and community health experiences, academic advising, mentoring, and a test preparation course for professional school (e.g., MCAT).[69]

Medical/Dental Education Preparatory Program (MEDPREP) at Southern Illinois University: The program is five semesters long and has the mission of graduating URM students from health profession schools who will serve in parts of the U.S. where shortages exist. The students work with an academic advisor to tailor their academic program and complete their standardized test preparation courses.[70] A previous study showed that compared to a national sample of physicians, 53% of program alumni chose primary care specialties (compared with 34% nationally) and were 2.7 times more likely to work in medically underserved areas.[26]

Non-traditional Mentoring Services

Several organizations are taking non-traditional approaches to mentoring undergraduates who are interested in health care careers. These initiatives are especially important for underrepresented students who attend colleges that do not provide comprehensive mentoring and support services.

Tour for Diversity in Medicine: A non-traditional model that augments what colleges offer through tours of colleges and universities across the country to engage URMs interested in health professions. These interactive sessions focus on premedical academic achievement, the medical school application process, and skills-building specific to the medical, dental, and pharmacy fields.[71] Mentors remain in contact with students after the tour.

DiverseMedicine: A technology-based platform that provides a community of support for URMs interested in the field of medicine. The program offers web-based mentoring services during the months of September through June. The mentor can help review the student's personal statement and resume, as well as provide mock interviews. Additional information is provided to students via video, podcasts, blogs, and lecture series.[72]

Post-baccalaureate Programs

A number of colleges and universities operate post-baccalaureate programs that help students improve their prospects for admission to medical, dental, and/or pharmacy school. Components of post-baccalaureate programs typically include academic courses, preparation for admissions tests, and guidance regarding completing applications and interviews. Some post-baccalaureate programs limit enrollment to students from underrepresented or disadvantaged backgrounds and some target underrepresented or disadvantaged students who were previously unsuccessful in obtaining admission to medical school.

University of California Post-baccalaureate Consortium: Located at five UC campuses, the comprehensive post-baccalaureate programs provide intensive MCAT preparation and learning skills, enrollment in upper division science courses during the academic year at a UC campus or UC Extension, and guidance throughout the medical school application process. Some programs also provide clinical and research opportunities.[73] These programs are an effective intervention to increase the number of medical school matriculants from disadvantaged and underrepresented groups.[28]

Faculty Involvement with Partner Institutions and Engagement of Graduate Prospects

Our literature review and interviews surfaced only one concrete example of faculty involvement with partner institutions and engagement with graduate prospects. Much of this engagement may be done on an informal, ad hoc basis or may be a part of other partnership initiatives, such as "bridging" programs for community colleges and enrichment programs for undergraduates.

Communities of Practice at UC Davis School of Medicine: Established through the Center for a Diverse Healthcare Workforce at UC Davis (the Center), the Communities of Practice (CoP) engages teams of faculty and staff from schools of health throughout the country. CoP are structured in three phases:

> Phase 1 – Learning and Planning: A yearlong agenda where CoP members participate in structured conversations every two months via conference call. Periodically, the members convene for an in-person learning session.
>
> Phase 2 – Implementation: Supports each member's local implementation efforts and begins dissemination work.
>
> Phase 3 – CoP Fellowship: Program completers become CoP Fellows to co-lead future CoPs and lead research, training, and dissemination efforts.[74]

In addition, the Center develops and conducts research projects aimed at ensuring a more diverse student body, faculty, and healthcare workforce. A list of recent projects can be found through The Center's website.[75]

Hire URM Faculty and Mentors that Understand Cultural and Socio-economic Challenges of Students

Faculty who participate in summer and academic year enrichment programs often serve as mentors for undergraduate pre-health professions students from disadvantaged and underrepresented backgrounds. Pre-health professions students also benefit from having mentors outside of academia. The need for mentoring continues once a student is enrolled in a graduate program in a health profession as students may need additional mentoring to cope with the academic and psychosocial challenges of professional school.

Health Career Connection: A national non-profit that connects URMs who wish to pursue healthcare and public health careers to real-world experience and networking. Key cornerstones of the program are internship opportunities, mentorships, and educational stipends.[76]

Underrepresented in Medicine mentoring program and dinners at UC San Francisco: Mentorship program between URMs and faculty physicians, whereby the physicians share institutional knowledge, provide emotional support, and meet with the mentees over dinners.[77] While faculty of all backgrounds are welcome to participate, the program especially encourages participation from faculty who are themselves from underrepresented or disadvantaged backgrounds.

PROF-PATH Program at UC San Francisco: Provides funding, classes, mentorship, community, and opportunities for training for URM students in all UCSF professional schools (School of Medicine, School of Pharmacy, School of Nursing, and School of Dentistry).[78] Qualitative program evaluation showed high satisfaction with the program; quantitative program evaluation revealed that students improved their research knowledge and self-efficacy in finding good mentors and meeting professional challenges when compared to students in a traditional UCSF research program.[79]

Conclusion and Recommendations

Our literature review and interviews identified multiple barriers to increasing the number of URMs in the health professions, including the cost of higher education, lack of exposure to health professions, poor academic preparation, difficulty obtaining access to required courses, lack of mentors, poor advising, and psychosocial challenges, such as stereotype threat. No single solution can address all of these barriers. A comprehensive, multi-faceted approach is needed. Drawing upon efforts aimed at increasing the numbers of URMs in the biological sciences, we propose a framework with three major components:

- Institutional partnerships
- Tailored support to facilitate students' academic success
- Engagement of faculty and leaders in institutional change

Implementing strategies that encompass all three elements of the framework is critical to increasing the numbers of URMs in the health professions. Institutional partnerships are essential to expose young URMs to career opportunities in health care and to ensure that they have accurate information about the preparation needed to pursue those opportunities. Tailored academic, financial, and psychosocial support enables students to maximize their potential. Institutional change is perhaps the most difficult part of the framework to implement, but it is also the most important. Too often partnerships and student support services depend on the dedication of small numbers of faculty and staff who rely on external sources of funding to carry out their work. Institutions need to invest their financial resources in these areas, implement holistic procedures for reviewing applications for admission, and create a climate in which all students feel they belong regardless of their race/ethnicity. What follows are suggested recommendations for stakeholders who are committed to increasing racial and ethnic diversity in the health professions.

Recommendations

Stakeholders committed to increasing racial and ethnic diversity in the health professions can take a number of actions to encourage educational institutions to strengthen their commitment to training underrepresented students. Philanthropic foundations and governmental agencies can provide financial resources to help institutional leaders develop and sustain initiatives to increase diversity. Advocacy organizations can raise awareness of the need to increase diversity, encourage institutions to implement policies and programs that support diversity, and advocate for adequate resources for these policies and programs. Health care employers can also contribute by providing paid internships, work-based learning programs, and other opportunities for young people from underrepresented backgrounds to learn about health professions and acquire mentors and work experience in the field.

The recommendations listed below are organized using the organizing framework on page 10. In each category, we provide examples of actions that advocates and philanthropic foundations can take to encourage institutions that train health professionals to develop comprehensive strategies for increasing racial/ethnic diversity.

Institutional Partnerships

Institutional partnerships are critical for creating a pipeline of URMs who are prepared to enter health professions education programs. The goals of these partnerships should be to increase the underrepresented student's knowledge of careers in health care and to improve their preparation for completing undergraduate degrees in health professions or pre-health fields and for graduate-level education. Educational institutions need financial resources and political support to develop and sustain successful partnerships because they face many competing demands.

Philanthropic foundations can help foster URM pipeline partnerships by providing grants to educational institutions and employers that are located close to one another to develop and sustain partnerships. These partnerships should include colleges and universities at all levels. Inclusion of community colleges is especially important because many URMs begin their college careers at community colleges. Examples of specific services that partnerships could provide include:

- Workshops, conferences, etc., to expose URM students to URM health professionals and to learn about health care careers and requirements for admission to training programs and licensure.

- Summer enrichment programs at health professions schools to enhance URM undergraduates' preparation for admissions to graduate level health professions schools and provide them with opportunities to interact with URM students and faculty at graduate level health professions schools. See page 14 of the report for examples of summer enrichment programs.

- Opportunities for URM faculty and health professions students to mentor URM undergraduates during the academic year.

- Collaboration with local employers to develop paid internship opportunities for undergraduate students and persons with bachelor's degrees to work in the health care sector as patient navigators, health coaches, or in other positions in health care organizations in which they would work directly with patients whom they share similar racial/ethnic, linguistic, and socio-economic backgrounds. Preference could be given to URM students and recent graduates from partner educational institutions to enable these individuals to obtain work experience that would make them more competitive applicants for graduate-level training programs in the health professions.

Advocates can call attention to the importance of partnerships by directly engaging health professions education institutions and by advocating for public policies that promote partnerships. Examples of public policies include:

- Allocating state budget resources to support local partnerships among public community colleges, bachelor's degree granting institutions, and health professions schools.

- Providing funds to the California Office of Statewide Health Planning and Development (OSHPD) to provide grants to health professions schools to develop summer enrichment programs and/or internships at local health care organizations and pay students' stipends.

- Increasing funding for NIH's Bridges to Baccalaureate's program to enable more colleges and universities in California and other states to participate. A description of this program can be found on page 12.

Tailored Student Support/Academic Success

Research has demonstrated that receiving comprehensive academic, emotional, financial, and social support services increases the likelihood that URM undergraduates will complete undergraduate degrees and obtain admission to graduate level education programs in the health professions. Components of these programs typically include study skills training, tutoring, academic advising, peer support, faculty mentoring and preparation for admissions tests. The peer support component of such programs is vital because it provides entering students with a cohort of peers with similar interests and backgrounds who understand the challenges they face and can offer practical advice for surmounting them. Examples of comprehensive support programs cited in this report include the Biology Scholars Program at UC-Berkeley and the Medical Scholars Program at UC-Riverside (see

pages 17 and 18). Financial support is also essential for many URM students because they come from disadvantaged backgrounds.

Post-baccalaureate programs that focus on assisting URMs and other persons from disadvantaged backgrounds have also been found to increase the number of successful URM applicants to health professions schools. Faculty and staff who operate post-baccalaureate programs work closely with participants to customize the services each of them receives so that they focus on those areas in which they have the greatest opportunity to strengthen their applications.

Philanthropic foundations can invest resources to fund comprehensive support programs and post-baccalaureate programs at additional colleges and universities in California. Ideally, these programs should be part of broader institutional partnerships among community colleges, colleges and universities that award bachelor's degrees, and graduate level health professions schools. Other investments that philanthropic foundations could pursue include:

- Providing scholarships to reduce the amount of loans that pre-health professions students and health professions students need to take out to finance their education.

- Investing in non-traditional mentoring services to assist students at colleges and universities that do not provide comprehensive academic and psycho-social support for undergraduates from underrepresented racial/ethnic groups who are interested in careers that require a professional degree.

Supporters can advocate for funding for comprehensive support programs and post-baccalaureate programs at the state and federal level. Possible approaches to securing public funding in California are:

- Including funds in the budgets for public colleges and universities to cover costs associated with comprehensive support programs.

- Providing funds to OSHPD to award grants for comprehensive academic support programs.

- Providing funds to OSHPD to award grants for non-traditional mentoring services.

Comprehensive support and post-baccalaureate programs are necessary for increasing the number of URMs in the health professions but may be insufficient unless they are accompanied by changes in admission requirements that de-emphasize scores on standardized tests relative to other criteria. As noted on page 15, Charles Drew University and UC-Davis are examples of medical schools in California that take a more holistic approach to assessing applicants by taking into account other factors, such as demonstrated interest in caring for underserved populations and socio-economic circumstances.

While admissions policies are set by health professions schools and programs, philanthropic foundations can provide funds to associations of health professions schools to develop seminars, manuals, and other types of resources to health professions schools that are interested in training their admissions committees to implement holistic review.

Institutional Change

Perhaps the most important thing that philanthropic foundations can do to stimulate institutional change with regard to increasing the number of URMs in the health professions is to ask educational institutions that apply for

grants to provide matching funds. Requiring educational institutions to provide matching funds ensures that they invest some of their own resources into initiatives aimed at increasing the number of URM health professionals.

Specific investments that foundations may wish to consider include:

- Providing grants that enable faculty who are interested in mentoring URM students to reduce the amount of time they need to spend on clinical, administrative, research, and teaching responsibilities so that they can devote more time to mentoring.

- Communities of practice that engage faculty and staff across colleges and universities to share best practices for increasing the number of URM students. In addition to providing a venue for sharing models that work, communities of practice also provide opportunities for faculty and staff who lead initiatives to network with and support one another. Examples of communities of practice include the Communities of Practice established by Center for a Diverse Healthcare Workforce at UC-Davis which are described on page 19.

Advocates can encourage health professions schools and programs to take greater responsibility for increasing the number of URM health professionals by monitoring their progress and reporting their findings publicly.

Another role that advocates can play is to mobilize URM alumni from health professions schools to mentor pre-health and health professions students from underrepresented backgrounds and sponsor internship opportunities for them. Alumni can also be mobilized to advocate for their alma maters to strengthen their efforts to recruit and retain URM students and faculty. Health professions schools may be more responsive to alumni than to other stakeholders because maintaining good relationships with alumni is important to encourage them to give their time and financial resources to the school.

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