CENTER FOR HEALTH WORKFORCE STUDIES

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Facilitating Racial and Ethnic Diversity in the Health Workforce

Executive Summary

The University of Washington Health Workforce Research Center on Allied Health (UW HWRC) received a rapid response request from the National Center for Health Workforce Analysis to summarize the state of the evidence on efforts to recruit and retain a racially and ethnically diverse health workforce. The findings presented in this brief are based on a search of the peer-review and grey literature from 2010 to 2015. To set the stage for the findings, the UW HWRC compared the current racial and ethnic mix of the health workforce to the mix ten years prior using the American Community Survey.

The key findings are:

- The health workforce is more diverse than the U.S. population, and has increased in racial and ethnic diversity over the last decade.
- The trends in racial and ethnic diversity varies considerably by occupation, although minorities tend to be more highly represented among the lower skilled occupations.
- While various programs exist to increase racial and ethnic diversity of the health professions, the evidence on the effectiveness of such programs and interventions is minimal in the peer-review literature from the last five years.
- The majority of published articles are descriptive and present program models or theories on how to design programs to increase racial and ethnic diversity in the health professions.
- The fields of medicine and dentistry are most represented among the literature.
- The peer-reviewed and grey literature primarily focus on evaluating and assessing the following program outcomes: increasing interest in health professions, increasing interest in and applications to professional schools, and increasing enrollment. The focus is less on graduation and career trajectories.
- Promising practices supported by evidence in the literature to increase racial and ethnic diversity across various levels of educational settings include: targeted recruitment and revised admissions policies, curriculum changes, summer enrichment programs, and comprehensive programs that integrate multiple intervention such as financial support, academic support, and social support.
- More and better evaluation is needed to assess the extent to which programs and interventions contribute to long-term goals of diversifying the workforce.

Introduction

Racial and ethnic diversity among health professionals has been shown to promote better access and healthcare for underserved populations, as well as better meet the health needs of an increasingly diverse population (Grumbach and Mendoza, 2008; Health Resources and Services Administration, 2006; Smedley, Butler and Bristow, 2004). Racial and ethnic minorities defined as Hispanic, African Americans, American Indians, Alaska Natives, Native Hawaiians, and other Pacific Islanders, per federal definitions, remain underrepresented in the health professions despite efforts to increase the diversity of the healthcare workforce (AHRQ, 2013; Brown et al, 2005; Sullivan Commission, 2004). Several barriers to achieving a more diverse health workforce have been documented including financial barriers, academic preparation, unwelcoming campus climate, and lack of social and emotional support (Sullivan Commission, 2004). Substantial resources from a wide range of sources have been dedicated to help alleviate these barriers and to more effectively recruit and retain a racially and ethnically diverse health professions workforce.

The University of Washington Health Workforce Research Center on Allied Health (UW HWRC) housed in the UW Center for Health Workforce Studies (CHWS) received a rapid response request from the National Center for Health Workforce Analysis (NCHWA) to summarize the state of evidence about "what works" in recruiting and retaining underrepresented minorities in healthcare professional programs. To set the stage for the discussion, UW HWRC was also asked to discuss how the racial and ethnic diversity of the health workforce has changed over time. As such, this brief presents summary statistics of the racial and ethnic mix of the health workforce in 2004 and 2013, a ten year period, using the American Community Survey.

Setting the Stage: Racial and Ethnic Mix of the Health Workforce

Generally, tracking and assessing the racial and ethnic mix of the health workforce is done on an ad hoc basis with reports produced by either academics or state/federal agencies. For the national perspective, the primary source of national data on the racial and ethnic mix of the health workforce is the American Community Survey (ACS), which is an annual nationally representative household survey conducted by the U.S. Census Bureau. Data on the diversity of the pipeline of workers are available through the Integrated Postsecondary Education Data System (IPEDS) for those in occupations requiring at least a post-secondary award; however, data are not available for those with less than a post-secondary award. While state and federally funded health workforce training programs are required to collect diversity-related data, the data suffer from high non-response rates by the individual participants in the training programs.

Two reports recently summarized the current race and ethnic mix of the health workforce. First, NCHWA in 2015 used ACS data pooled from 2010 to 2012 to summarize the diversity within each health occupation. The report showed that the racial and ethnic mix of the health workforce varied considerably by occupation, with a higher share of minorities among the assistant, aide and other healthcare support occupations (U.S. Department of Health and Human Services, 2015). Second, a Joint Center report by Frogner and Spetz in 2013 also used ACS data pooled from 2009 to 2011 to identify

occupations by health industry with the highest shares of minorities, and then attempted to project the future racial and ethnic mix of the health workforce. The report also noted a predominance of minorities in lower skilled occupations, including direct and indirect care jobs. Given projections of significant job growth among lower skilled occupations combined with the predominance of minorities in these occupations, the overall health workforce may be increasingly racially and ethnically diverse. The report cautions, however, that the projections should not necessarily be taken as targets and that further work is needed to assess whether these are good quality jobs that allow for upward mobility.

In this brief, we also draw from the ACS to examine how the racial and ethnic mix of the health workforce changed over a decade from 2004 to 2013. We use single year 1% samples of the ACS IPUMS-USA database which has harmonized data for consistency across these sample years (IPUMS-USA, University of Minnesota, www.ipums.org). We focus on a selected set of 41 health occupations from the ACS using the 2000 Standard Occupational Classification (SOC) system. We found that in 2013 the health workforce is more racially diverse than the U.S. population with 70.9% of the health workforce being White Non-Hispanic compared to 75.3% in the U.S. population. The health workforce has a higher share of African American Non-Hispanics (18.2% v. 14.8%) and Asian/Pacific Islanders Non-Hispanics (8.1% v. 6.2%) compared to the U.S. population, and a lower share of all other races, most notably White Non-Hispanics (70.9% v. 75.3%). The health workforce has a considerably lower share of Hispanics (10.9% v. 17.1%) compared to the U.S. population. Over the last decade, the health workforce became increasingly diverse. The share of African American Non-Hispanics saw the largest gain in share of the health workforce (16.9% in 2004 to 18.2% in 2013), which is a larger increase than compared to the U.S. population trends (14.0% in 2004 to 14.8% in 2013. Hispanics gained representation in the health workforce (8.5% in 2004 to 10.9% in 2013) though at a slightly slower rate compared to the U.S. population (14.2% in 2004 to 17.1% in 2014). One macro trend to consider is that the racial and ethnic mix of the U.S. population generally reflects the trend in the racial and ethnic mix of the overall labor force, with a slight underrepresentation of Hispanics in part due to the slightly younger age skew of this demographic.

As noted in earlier reports, the racial and ethnic mix varies considerably by occupation. In Table 1, the five least racially diverse health occupations are Veterinarians (93.8% White Non-Hispanics), Speech-Language Pathologists (92.8%), Chiropractors (92.4%), Audiologists (91.9%), and Occupational Therapists (89.7%). The five most racially diverse health occupations are Nursing, Psychiatric, and Home Health Aides (53.9% White Non-Hispanics), Personal and Home Care Aides (57.6%), Miscellaneous Health Technologists and Technicians (65.0%), Licensed Practical Nurses and Licensed Vocational Nurses (66.2%), and Social Workers (67.0%). Compared to 2004, African Americans gained the largest share among Therapists, All Other (5.2 percentage points) by 2013 and lost the largest share among Radiation Therapists (7.9 percentage points). Asian/Pacific Islanders gained the most ground among Pharmacists (6.9 percentage points) and lost ground among Health Diagnosing and Treating Practitioners, All Other (23.1 percentage points).

In Table 2, we show the five occupations in which Hispanics are least represented: Veterinarians (2.1% Hispanic), Physical Therapists (2.8%), Occupational Therapists Assistants and Aides (3.5%), Dietitians and Nutritionists (3.5%), and Therapists, All Other (3.6%). The five occupations in which they are most

represented are Dental Assistants (20.7% Hispanic), Medical Assistants and Other Healthcare Support Occupations (20.3%), Personal and Home Care Aides (18.6%), Medical, Dental, and Ophthalmic Laboratory Technicians (14.1%), and Opticians, Dispensing (14.1%). Hispanics gained the most ground among Physician Assistants (8.3 percentage points) compared to 2004, and lost the largest share among Radiation Therapists (13.4 percentage points). To provide annual rates of change in race and ethnic participation in each occupation over this 10-year period we ran separate regression models of each racial and ethnic group for each occupation. The group participation (e.g. percent Black of Social workers) is the outcome for a particular racial and ethnic category as a function of time conditional on occupation. With this approach we were able to identify the five fastest and slowest growing occupations within each racial and ethnic category, which provides a slightly different perspective than looking at the absolute change in the share that each racial and ethnic group represents in each occupation. The results in Table 3 can be interpreted as, for example, an average annual increase of 0.496% per year (or average annual rate of change) in the percent of White Non-Hispanics in Occupational Therapist Assistants and Aides. Alternatively, White Non-Hispanics saw an average annual decrease of 0.942% per year in their representation among Massage Therapists. Much like we saw with earlier tables, no trend exists in the increase or decrease in occupation across racial and ethnic groups.

The ACS has some limitations to consider. First, individual year tracking of the health workforce is limited by small sample sizes when breaking down occupations by detailed minority categories. Thus tracking annual changes of the health workforce produces unstable estimates, hence the reason why other reports use a three-year pooled sample. Second, geographic detail is limited to protect respondents such that one-year and three-year samples may result in larger margins of sampling error in rural areas or a lack of detail for these areas. Third, tracking occupations over time is challenging given the restrictions on how occupations are coded and the change in occupation titles over time though this problem is not unique to the ACS. Similarly, ACS is not able to track emerging occupations. Nonetheless, ACS is the largest and most reliable dataset available to look at the entire health workforce.

Facilitating Racial and Ethnic Diversity in Health Education Programs: What Works?

In 2009 the U.S. Department of Health and Human Services, Health Resources and Services Administration (HRSA) along with the Office of Public Health and Science (OPHS) conducted a study to the explore evidence for pipeline programs. The report concluded that while more rigorous evaluation is needed, “high quality studies suggest that pipeline program interventions can exert a meaningful, positive effect on student outcomes” (p. 37).They noted that summer enrichment programs and academic support programs are promising interventions to improve academic performance and increase interest and enrollment in health profession programs. In this section, we summarize the state of the evidence from the peer-review and grey literature over the past five years on the effectiveness of pipeline programs that seek to recruit and retain minorities into the health workforce.

Specifically, we were guided by two questions:

1. What efforts or models have been used to recruit and retain racial and ethnic groups underrepresented in health professional programs?
2. What evidence exists regarding the effectiveness of efforts and models designed to enhance racial and ethnic diversity in the health workforce?

The review consisted of literature searches on the PubMed and the Educational Resources Information Center (ERIC) online databases, using the following key words: assessment; evaluation; health care; health professions; health workforce; minority health; pipeline programs; racial and ethnic diversity; underrepresented minorities. A search for grey literature was conducted via internet search engines, organization websites, and the Grey Literature Report. A reference librarian was consulted to ensure searches were systematic and comprehensive. Articles and reports were selected for review if they met the following criteria: (1) published between 2010 and 2015, (2) the intervention (program, effort, change) was specifically designed to target and increase racial and ethnic diversity in health professions, and (3) must have a focus on evaluating a program/intervention or provide some outcome data as to how effective the program was at meeting its intended goals and contributing to the diversity of the health professions.

Overview of Findings

Similar to the HRSA and OPHS 2009 study, we found that many published articles are mostly descriptive in nature, focusing on components of the program and theory underlying the program with little emphasis on evaluating or demonstrating the effectiveness of the program. When data were provided, most focused on reporting participant demographics, or general enrollment and graduation rates of racial and ethnic minorities at their institution. A majority of the evaluated programs were at the undergraduate level with the intent to create a pathway of support and encouragement for students to pursue health professions.

In this review, the professions with the most recent evaluation studies include medicine and dentistry. The emphasis on dental schools, however, could be explained by the Robert Wood Johnson Foundation (RWJF) and California Endowment's initiative, "Pipeline, Profession, and Practice: Community-Based Dental Education" (Dental Pipeline Program). The initiative focused on increasing underrepresented minorities in dental schools and outlined a comprehensive evaluation plan for grantees. The Dental Pipeline Program was in place from 2001-2010. Many reports after 2010 highlight the success of their programs and may have sparked additional interest in diversity in dentistry.

There is a significant body of literature focusing on approaches to recruit and retain racially and ethnically diverse students at the undergraduate level, with an increasing focus on the Science, Technology, Engineering, and Math (STEM) fields. Such efforts include: financial support, academic support such as supplemental instruction and academic enrichment programs, transition programs such as summer bridge, social support such as student organizations and clubs, building a more inclusive campus climate, recruiting a more diverse faculty, mentoring programs, targeted recruitment, collaborative school partnerships, and holistic admissions programs.

With regards to the specific request by NCHWA, a small body of literature exists on evaluating the efforts to recruit and retain racially and ethnically diverse students at the graduate and professional levels, particularly in the health professions (e.g., medicine, dentistry, pharmacy, physician assistant, and behavioral health). The efforts discussed in the literature at the graduate and professional level are similar to those at the undergraduate level including efforts such as mentoring, financial assistance, holistic admissions, targeting recruitment, and career development opportunities. In Table 4, we briefly summarize the evidence for each of the programs that have been identified as an approach to recruiting and retaining a racially and ethnically diverse health workforce. For about half of the programs, we found at least one or two studies in the last five years that provided empirical evidence, but for the other half there was limited or no evidence in the peer-review or publicly available grey literature. We provide a few examples of the most promising programs below. An important aspect of promising programs is that many are multifaceted, ***comprehensive programs*** that employ a combination of interventions such as financial supports, social supports, mentoring, and intensive training opportunities.

Research and evaluation suggest that ***targeting recruitment and restructuring admissions policies*** to be more holistic and comprehensive are promising practices to increase the number of racially and ethnically diverse students who apply and are admitted to health profession schools. An evaluation of the RWJF's Dental Pipeline Program used a quasi-experimental design to compare outcomes from the Pipeline schools with those from non-Pipeline schools. The study found that strategic outreach to underrepresented populations and changing admissions procedures were commonly used approaches among participating schools, which resulted in an increase in applications from and enrollment of underrepresented minority students at all fifteen participating institutions (Brunson, 2010; RWJF, 2009 & 2013). Institutional level case studies of holistic admissions models also support the idea that restructuring admissions to be more holistic was useful in recruiting and admitting more racial and ethnic minorities (Brunson, 2010; Lacy, 2012).

There is also promising evidence that ***summer enrichment programs*** are useful in facilitating entry to health professional schools. The Robert Wood Johnson Foundation's (RWJF) Summer Medical and Dental Education Program (SMDEP) was designed to increase the number of students from underrepresented backgrounds who become physicians and dentists. Mathematica Policy Research produced an evaluation of the RWJF SMDEP in 2015 using mixed methods including a quasi-experimental design to assess the impact of the program on student recruitment, education outcomes, career trajectories, and institutional culture, and to identify key components of success. The evaluation found that more than half of participants applied to medical or dental school and over a third matriculated. Additionally, SMDEP participants were more likely than non-participants to apply to and matriculate in medical or dental school (Mathematica Policy Research, 2015).

Curriculum change and enhanced program offerings are also promising practices that have increased the level of interest in health professions and application to health professional schools. Bailey and colleagues (2012) studied the impact of offering a program that trains physicians to work in underserved communities on applications from underrepresented minority students and found underrepresented minority students were more likely than non-underrepresented minority students to indicate interest in

that specific program. The Dental Pipeline Program also focused heavily on changing curriculum to be more community-based in the hopes of recruiting a more diverse student population. Vela and colleagues (2010) conducted a survey to assess impact of a health disparities course in the medical school curriculum on recruitment of underrepresented minority students at the University of Chicago. They found that underrepresented minority students were more likely than non-underrepresented minority students to report that the existence of the course influenced their decision to attend that specific school.

Limitations

The literature review was met by a few limitations. First, some evaluation and assessment studies may be internal and not published and thus would not be identified through searches. Second, assessment and evaluation efforts that result in negative or null findings may not be made public or found in peer reviewed journals and therefore also would not be identified in this search.

In this review, the majority of published research articles included single institution or system case studies with no comparison groups that mostly describe the outcomes of the programs. Given this limitation, most of the studies could not attribute change to a particular intervention. While descriptive data are helpful to understand the functioning and operation of a program, these types of analysis are not as strong in their ability to show the overall impact of the program on long-term goals and outcomes. We found almost no studies that included an experimental design. We only found a few studies with some type of quasi experimental design that used a pre-post measure or non-participant comparison group. The lack of rigorous assessments and evaluations may be due to lack of time, lack of financial resources, difficultly of collecting and storing data, difficulty of obtaining control groups, and resistance of programs to be evaluated.

Conclusion

In this report we found that the health workforce is more diverse than the U.S. population, and has increased in diversity over the last decade. The role that specific programs play in facilitating a racial and ethnic diversity in the healthcare professions is unclear. We found minimal published or grey literature demonstrating the long-term success of these programs on the change in the representation of racial and ethnic minorities in the healthcare professions. While there have been several efforts to increase the racial and ethnic diversity of the healthcare workforce over the years, racial and ethnic minorities remain underrepresented in much of the healthcare workforce, especially in high-skilled occupations. Some efforts have been found to be effective at increasing the interest, application, and enrollment of racial and ethnic minorities into health profession schools such as medicine or dentistry, yet there is still a missing link in the pipeline between entry, persistence, graduation, and pursuit of a career. There are a variety of programs designed to support racial and ethnic minorities in professional schools including mentoring programs, professional development, academic and social supports, and financial supports, yet evidence regarding the longer term effectiveness of such programs on retaining and graduating students and facilitating a career in medicine, dentistry, pharmacy, and other health professions is lacking.

Our review indicates there is a growing need for more and better assessment and evaluation. While there are a few studies that do employ more thorough, rigorous evaluation methods - for example, the RWJF SMDEP evaluation by Mathematica, Campbell et al's evaluation of the USSTRIDE program, and Keith and Hollar's evaluation of the Medical Education Development program at University of North Carolina - there is still ample opportunity for additional research to demonstrate the impact of such programs on recruitment and retention of racially and ethnically diverse students. Qualitative and quantitative evaluation studies that are rigorous in demonstrating the impact of a program or intervention on an intended outcome are important to the increasing focus on accountability and evidence informed decision-making in both higher education and the healthcare. Additionally, evaluation and assessment must go beyond reporting and monitoring participation as a measure of performance; evaluation should focus on the goals of the program and assess the extent to which such programs and efforts are meeting their intended goals, contributing to the overall development of students into professions, and enhancing the diversity of the health workforce at all levels.

There are several areas in need of further exploration including: pipeline or pathway efforts to diversify the behavioral health workforce and the allied health professions in general; the impact of increasing faculty diversity as an intervention to improve recruitment and retention of diverse students; and additional non-practitioner based outcomes such a faculty or research careers. It is also important to note that programs need to be tailored to specific populations and contexts. For example, a specific program might be "effective" at one institution but not at another. More exploration of the contextual factors that impact program outcomes is also needed. Finally, the retention of racial and ethnic minorities once they are in the profession is another area in need of exploration which may help explain why they are still underrepresented – even if one successfully graduates and obtains a job as a physician or dentist, will they stay?

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Table 1: Racial Distribution of Non-Hispanics in Selected Health Occupations in 2013 and Change from 2004

	WHITE		AFRICAN-AMERICAN		ASIAN/PACIFIC ISLANDER		AMERICAN INDIAN/ALASKAN NATIVE		MIXED RACE	
	2013	CHANGE FROM 2004	2013	CHANGE FROM 2004	2013	CHANGE FROM 2004	2013	CHANGE FROM 2004	2013	CHANGE FROM 2004
VETERINARIANS	93.8	0.4	1.6	-1.3	3.5	-0.1	0.0	0.0	1.1	1.1
SPEECH-LANGUAGE PATHOLOGISTS	92.8	-0.8	3.6	0.8	2.0	0.3	0.3	0.3	1.3	-0.5
CHIROPRACTORS	92.4	3.1	1.2	-2.2	3.8	-3.6	0.4	0.4	2.3	2.3
AUDIOLOGISTS	91.9	-2.7	1.8	-0.9	4.4	4.4	0.4	0.4	1.5	-1.3
OCCUPATIONAL THERAPISTS	89.7	2.0	3.9	-1.4	5.6	0.2	0.0	-0.6	0.7	-0.3
DENTAL HYGIENISTS	88.6	-6.4	4.9	3.0	4.9	2.8	0.0	-0.4	1.6	1.0
EMERGENCY MEDICAL TECHNICIANS AND PARAMEDICS	88.5	-2.3	5.7	1.7	3.0	1.4	0.5	-1.8	2.3	1.0
PSYCHOLOGISTS	88.2	-2.2	5.3	-0.8	4.1	2.2	0.1	-0.1	2.4	1.0
OCCUPATIONAL THERAPIST ASSISTANTS AND AIDES	88.1	8.4	9.0	1.0	2.3	-10.0	0.3	0.3	0.3	0.3
OPTICIANS, DISPENSING	85.8	-3.8	7.4	0.5	4.7	2.5	1.1	1.1	1.0	-0.4
OPTOMETRISTS	84.6	-2.5	1.5	-0.3	11.7	0.8	1.0	1.0	1.2	0.9
PHYSICAL THERAPIST ASSISTANTS AND AIDES	84.3	-0.1	8.0	-2.9	5.1	0.7	0.8	0.5	1.9	1.9
RADIATION THERAPISTS	83.1	8.1	10.3	-7.9	4.2	-2.7	0.0	0.0	2.4	2.4
PODIATRISTS	82.8	-6.3	6.8	0.4	9.4	4.8	0.0	0.0	1.0	1.0
PHYSICAL THERAPISTS	82.4	-1.2	3.8	-1.5	11.7	2.2	0.1	-0.1	1.9	0.6
OTHER HEALTHCARE PRACTITIONERS AND TECHNICAL OCCUPATIONS	81.4	-0.8	11.1	-2.9	4.2	2.6	0.5	0.3	2.8	0.8

	WHITE		AFRICAN-AMERICAN		ASIAN/PACIFIC ISLANDER		AMERICAN INDIAN/ALASKAN NATIVE		MIXED RACE	
	2013	CHANGE FROM 2004	2013	CHANGE FROM 2004	2013	CHANGE FROM 2004	2013	CHANGE FROM 2004	2013	CHANGE FROM 2004
DIAGNOSTIC RELATED TECHNOLOGISTS AND TECHNICIANS	81.0	-5.2	11.0	3.5	5.7	0.8	0.4	-0.5	2.0	1.4
RECREATIONAL THERAPISTS	80.8	2.3	16.2	-3.5	2.9	2.9	0.0	-0.9	0.0	-0.9
DENTAL ASSISTANTS	79.9	-1.4	9.0	-2.2	7.2	2.2	0.8	-1.0	3.1	2.5
PHYSICIAN ASSISTANTS	79.5	1.2	9.1	-5.6	8.5	2.8	1.0	0.9	1.9	0.7
MASSAGE THERAPISTS	79.5	-9.4	7.8	2.5	8.7	5.1	1.0	0.7	3.0	1.1
MEDICAL AND HEALTH SERVICES MANAGERS	78.0	-3.5	14.2	2.9	6.0	1.4	0.3	-0.5	1.6	-0.4
REGISTERED NURSES	77.7	-4.7	11.1	2.3	9.1	1.7	0.4	0.0	1.7	0.8
DENTISTS	77.6	-5.9	3.7	-0.9	16.9	6.2	0.1	-0.5	1.7	1.2
THERAPISTS, ALL OTHER	77.4	-9.0	13.3	5.2	6.8	2.9	0.4	-0.1	2.0	1.0
MEDICAL, DENTAL, AND OPHTHALMIC LABORATORY TECHNICIANS	76.0	-3.6	7.6	-2.6	12.7	4.8	0.7	0.7	3.0	0.7
RESPIRATORY THERAPISTS	75.6	-4.8	13.8	1.8	8.8	3.8	0.2	-0.2	1.6	-0.6
DIETITIANS AND NUTRITIONISTS	75.6	3.2	16.1	-1.1	6.2	-1.8	0.4	-1.5	1.8	1.2
HEALTH DIAGNOSING AND TREATING PRACTITIONERS, ALL OTHER	74.7	20.4	2.5	2.5	21.4	-23.1	0.2	-0.4	1.2	0.7
HEALTH DIAGNOSING AND TREATING PRACTITIONER SUPPORT TECHNICIANS	74.2	-4.6	14.6	2.4	8.4	2.3	0.5	-0.5	2.3	0.4
PHARMACISTS	72.4	-8.5	6.8	0.8	18.7	6.9	0.1	0.0	2.0	0.8

	WHITE		AFRICAN-AMERICAN		ASIAN/PACIFIC ISLANDER		AMERICAN INDIAN/ALASKAN NATIVE		MIXED RACE	
	2013	CHANGE FROM 2004	2013	CHANGE FROM 2004	2013	CHANGE FROM 2004	2013	CHANGE FROM 2004	2013	CHANGE FROM 2004
MEDICAL ASSISTANTS AND OTHER HEALTHCARE SUPPORT OCCUPATIONS	71.3	-3.2	19.5	1.6	6.3	0.6	0.6	0.2	2.3	0.7
COUNSELORS	71.2	-2.1	23.1	1.1	2.6	0.4	0.9	0.1	2.3	0.5
MEDICAL RECORDS AND HEALTH INFORMATION TECHNICIANS	70.7	-3.9	19.6	1.2	6.5	2.0	0.9	-0.4	2.3	1.0
PHYSICIANS AND SURGEONS	70.6	-4.5	5.8	1.1	21.4	2.5	0.1	-0.1	2.1	1.1
CLINICAL LABORATORY TECHNOLOGISTS AND TECHNICIANS	68.5	-1.9	15.8	-1.9	13.2	2.6	0.3	-0.1	2.2	1.3
SOCIAL WORKERS	67.0	-2.4	25.8	0.3	3.6	0.5	1.0	0.2	2.6	1.5
LICENSED PRACTICAL AND LICENSED VOCATIONAL NURSES	66.2	-5.3	26.6	2.7	4.7	1.8	0.7	-0.1	1.9	0.9
MISCELLANEOUS HEALTH TECHNOLOGISTS AND TECHNICIANS	65.0	-5.5	24.1	0.0	7.4	3.2	0.7	0.6	2.9	1.7
PERSONAL AND HOME CARE AIDES	57.6	-6.1	28.2	1.6	10.2	4.0	1.4	0.1	2.6	0.4
NURSING, PSYCHIATRIC, AND HOME HEALTH AIDES	53.9	-3.0	37.3	0.5	5.5	1.8	1.0	0.0	2.4	0.7

Table 2: Hispanic Distribution in Selected Health Occupations in 2013 and Change from 2004

	HISPANIC	
	2013	CHANGE FROM 2004
VETERINARIANS	2.1	0.8
PHYSICAL THERAPISTS	2.8	-6.1
OCCUPATIONAL THERAPIST ASSISTANTS AND AIDES	3.5	-1.5
DIETITIANS AND NUTRITIONISTS	3.5	-2.8
THERAPISTS, ALL OTHER	3.6	2.1
OPTOMETRISTS	3.7	-0.6
SOCIAL WORKERS	4.2	-0.6
AUDIOLOGISTS	4.6	-0.4
REGISTERED NURSES	5.0	5.0
OCCUPATIONAL THERAPISTS	5.1	0.9
RADIATION THERAPISTS	5.3	-13.4
PODIATRISTS	5.5	1.5
PHARMACISTS	6.5	0.3
RESPIRATORY THERAPISTS	6.5	2.6
MEDICAL AND HEALTH SERVICES MANAGERS	6.7	1.8
CHIROPRACTORS	7.2	3.5
RECREATIONAL THERAPISTS	7.9	0.8
HEALTH DIAGNOSING AND TREATING PRACTITIONER SUPPORT TECHNICIANS	8.0	3.1
DENTISTS	8.1	5.6
PHYSICIAN ASSISTANTS	8.3	8.3
LICENSED PRACTICAL AND LICENSED VOCATIONAL NURSES	8.7	1.5
OTHER HEALTHCARE PRACTITIONERS AND TECHNICAL OCCUPATIONS	9.6	4.7
PHYSICAL THERAPIST ASSISTANTS AND AIDES	9.7	0.1
PHYSICIANS AND SURGEONS	10.0	3.7
SPEECH-LANGUAGE PATHOLOGISTS	10.2	6.9

	HISPANIC	
	2013	CHANGE FROM 2004
DIAGNOSTIC RELATED TECHNOLOGISTS AND TECHNICIANS	10.3	-0.5
HEALTH DIAGNOSING AND TREATING PRACTITIONERS, ALL OTHER	10.5	2.1
CLINICAL LABORATORY TECHNOLOGISTS AND TECHNICIANS	10.5	4.8
MISCELLANEOUS HEALTH TECHNOLOGISTS AND TECHNICIANS	10.6	-3.8
DENTAL HYGIENISTS	10.8	1.7
MASSAGE THERAPISTS	11.1	5.6
PSYCHOLOGISTS	11.4	2.3
COUNSELORS	11.8	1.1
EMERGENCY MEDICAL TECHNICIANS AND PARAMEDICS	13.5	2.4
MEDICAL RECORDS AND HEALTH INFORMATION TECHNICIANS	13.5	2.7
NURSING, PSYCHIATRIC, AND HOME HEALTH AIDES	13.6	2.2
OPTICIANS, DISPENSING	14.1	6.1
MEDICAL, DENTAL, AND OPHTHALMIC LABORATORY TECHNICIANS	14.1	2.4
PERSONAL AND HOME CARE AIDES	18.6	1.6
MEDICAL ASSISTANTS AND OTHER HEALTHCARE SUPPORT OCCUPATIONS	20.3	6.3
DENTAL ASSISTANTS	20.7	2.5

Table 3. Occupations with the Highest and Lowest Annual Rate of Change in Participation by Race and Ethnicity, 2004-2013

RACE AND ETHNICITY	DIRECTION OF CHANGE	OCCUPATION	AVERAGE ANNUAL RATE OF CHANGE
WHITE (NON-HISPANIC)	increase	Occupational Therapist Assistants and Aides	0.496
		Health Diagnosing and Treating Practitioners, All Other	0.474
		Recreational Therapists	0.252
		Dietitians and Nutritionists	0.244
		Radiation Therapists	0.172
	decrease	Therapists, All Other	-0.566
		Respiratory Therapists	-0.648
		Dentists	-0.649
		Pharmacists	-0.861
		Massage Therapists	-0.942
AFRICAN AMERICAN (NON-HISPANIC)	increase	Podiatrists	0.343
		Respiratory Therapists	0.336
		Massage Therapists	0.311
		Health Diagnosing and Treating Practitioner Support Technicians	0.247
		Therapists, All Other	0.226
	decrease	Radiation Therapists	-0.184
		Dietitians and Nutritionists	-0.229
		Physical Therapist Assistants and Aides	-0.304
		Recreational Therapists	-0.361
		Physician Assistants	-0.495
ASIAN/PACIFIC ISLANDER (NON-HISPANIC)	increase	Pharmacists	0.699
		Dentists	0.622
		Medical, Dental, and Ophthalmic Laboratory Technicians	0.564
		Massage Therapists	0.531
		Audiologists	0.375

RACE AND ETHNICITY	DIRECTION OF CHANGE	OCCUPATION	AVERAGE ANNUAL RATE OF CHANGE
	decrease	Dietitians and Nutritionists	0.006
		Veterinarians	-0.037
		Radiation Therapists	-0.206
		Occupational Therapist Assistants and Aides	-0.431
		Health Diagnosing and Treating Practitioners, All Other	-0.585
AMERICAN INDIAN, ALASKA NATIVE	increase	Optometrists	0.099
(NON-HISPANIC)		Opticians, Dispensing	0.089
		Health Diagnosing and Treating Practitioners, All Other	0.063
		Massage Therapists	0.043
		Other Healthcare Practitioners and Technical Occupations	0.041
	decrease	Medical Records and Health Information Technicians	-0.046
		Dental Assistants	-0.047
		Dentists	-0.048
		Dietitians and Nutritionists	-0.098
		Emergency Medical Technicians and Paramedics	-0.105
MIXED RACE	increase	Radiation Therapists	0.258
(NON-HISPANIC)		Physician Assistants	0.211
		Dental Assistants	0.197
		Clinical Laboratory Technologists and Technicians	0.164
		Dental Hygienists	0.151
	decrease	Recreational Therapists	0.026
		Speech-Language Pathologists	0.022
		Medical, Dental, and Ophthalmic Laboratory Technicians	-0.007
		Respiratory Therapists	-0.013
		Audiologists	-0.148

RACE AND ETHNICITY	DIRECTION OF CHANGE	OCCUPATION	AVERAGE ANNUAL RATE OF CHANGE
HISPANIC	increase	Medical Assistants and Other Healthcare Support Occupations	.786
		Dental Assistants	.729
		Audiologists	.722
		Therapists, All Other	.679
		Opticians, Dispensing	.607
	decrease	Physical Therapist Assistants and Aides	-0.027
		Occupational Therapist Assistants and Aides	-0.114
		Miscellaneous Health Technologists and Technicians	-0.172
		Radiation Therapists	-0.417
		Recreational Therapists	-0.808

Table 4: Evidence for Effectiveness of Diversity Programs[1]

Type of Program	Evidence for Effectiveness of Program Type	Example Programs
Comprehensive Programs (programs that offer a combination of interventions)	– Undergraduates in a comprehensive program that incorporates academic support, mentoring, and social supports had higher acceptance rates to medical school than non-participants (Campbell, et al, 2014)* – Undergraduates in a comprehensive training program that incorporates coursework, advising, mentoring, and practicum experiences was correlated with increase interest and confidence in future career in Maternal and Child Health career (Guerrero, et al 2015) – Dental students in a comprehensive program that incorporates advising, tutoring, psychological counseling, extended curriculum and peer support had retention rates higher than the school average (Lacy, et al, 2011) – Undergraduate students who participated in a comprehensive program that incorporated summer institute, targeted recruitment, and internships reported the program influenced their decision to pursue a career as a cancer researcher (Pasick, et al, 2012) – Participation in a comprehensive post-baccalaureate program resulted in improved DAT scores, acceptance to dental schools, and graduation rates higher than the national average for dental schools (Wides, et al, 2013).*	UCSF Interprofessional Health Post-Baccalaureate Certificate Program Undergraduate Science Students Together Reaching Instructional Diversity and Excellence (USSTRIDE) Pathways for Students into Health Professions at UCLA Bridge to Dentistry at TAMHSC-Baylor College of Dentistry Pipeline, Profession, and Practice: Community-Based Dental Education (RWJF funded) HRSA - Health Careers Opportunity Program (HCOP) HRSA - Centers of Excellence (COE) HRSA - Nursing Workforce Diversity (NWD)

[1] Asterisks (*) indicated articles or reports with more robust study designs, including quasi-experimental designs such as pre-post assessments or employ the use of non-participant comparison groups.

Type of Program	Evidence for Effectiveness of Program Type	Example Programs
Targeted recruitment	– Deliberate recruitment activities help programs meet diversity goals in health profession graduate programs (Cahn, 2015) – URM specific recruiters correlated with higher URM student enrollment in PA programs (DiBaise, et al, 2015)* – Comprehensive, targeted, recruitment and admissions program led to higher than average enrollment of URM students into dental school (Lacy, et al, 2012)	Bridge to Dentistry at TAMHSC Baylor College of Dentistry
Holistic Admissions Review/Revamped Admissions Process	– Employing a more holistic admissions process Increased applications and admission offers for URM dental students (Lacy, et al, 2012; RWJF 2013; Brunson, et al, 2010)	Pipeline, Profession, and Practice: Community-Based Dental Education Bridge to Dentistry at TAMHSC-Baylor College of Dentistry
Summer Enrichment	– Summer Math and Dental Education program participants were more likely to apply to and matriculate in dental school than non-participants (Mathematica, 2015)* – Summer enrichment programs focused on preparing for the Dental admissions test (DAT) led to significant improvements in DAT scores among disadvantaged students (Johnson, et al, 2013)* – Undergraduates in an intensive summer program that incorporates academic coursework, test prep, tutoring, and social activities had higher than average medical school graduation rates (Keith & Hollar, 2012)*	Summer Medical and Dental Education Program (SMDEP; RWJF funded) Profile for Success (PFS) Program at the University of Michigan School of Dentistry (HCOP funded) Medical Education Development program at University of North Carolina
Curriculum Revision	– URM students more likely to express interest in program that prepares them to work with underserved communities (Bailey, et al, 2012)	UCSD MD-master's degree Program in Medical Education-Health Equity (PRIME-HEq)

Type of Program	Evidence for Effectiveness of Program Type	Example Programs
	– URM students more likely than non-URM students to report that the inclusion of a health disparities course in the medical school curriculum influenced their decision to attend that particular medical school (Vela, et al, 2010).*	Pipeline, Profession, and Practice: Community-Based Dental Education
Research experiences and internships	– Participating in postsecondary research opportunities may increase the likelihood of pursuing academic faculty career in medicine (Jeffe, et al., 2012)* – 97% of undergraduate students in a summer research program for native American students went on to receive a science degree and 50% continued on to graduate programs in science or medical school (Holsti, et al, 2015) – Participation in a research and mentoring program increased medical students' research skills, knowledge about career opportunities, and interest in future HIV vaccine research (Sopher, et al 2015) – Summer research programs may help undergraduates pursue graduate and profession degrees and become employed in the public health sector (Duffus, et al, 2014)	Research and Mentorship Program (RAMP; NIH Funded program) IMHOTEP at Morehouse
Career and professional development	– Medical schools with highly intensive minority faculty development programs are associated with increased URM faculty representation (Guevara, et al, 2013)*	
Mentoring	– Faculty mentoring program for psychiatry students promoted scholarship and leadership activities (Harris, et al, 2013) – Mentorship from students currently in a dental program increased undergraduate mentees' interest in pursuing oral health related careers (Inglehart, et al, 2014) – See also above section on comprehensive programs	Texas Regional Psychiatry Minority Mentor Network (TRPMMN) Program
Institutional Commitment /Leadership & Dedication of Resources	– Developing and implemental a comprehensive strategic plan for diversity increased URM enrollment and URM faculty. (Deas, et al, 2012)	Office of Recruitment, Development, and Diversity Initiatives at the UNC Eshelman School of Pharmacy

Type of Program	Evidence for Effectiveness of Program Type	Example Programs
	– The establishment of an Office of Recruitment, Development, and Diversity Initiatives in the School of Pharmacy that provided comprehensive recruitment programs helped increase the enrollment of URM students (White, et al, 2013)	
Academic support	– See above section on comprehensive programs	
Social support	– See above section on comprehensive programs	
Financial support	– Included as part of many recruitment and comprehensive programs	Pipeline, Profession, and Practice: Community-Based Dental Education HRSA - Scholarships for Disadvantaged Students (SDS) HRSA - Loans for Disadvantaged Students (LDS)
Community engagement	– No recent evaluations or assessment	Pipeline, Profession, and Practice: Community-Based Dental Education
Increasing Faculty Diversity	– No recent evaluations or assessment	

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