

Ethnic Diversity Remains Scarce in Academic Plastic and Reconstructive Surgery

Paris D. Butler, M.D., M.P.H.
L. D. Britt, M.D., M.P.H.
Michael T. Longaker, M.D.,
M.B.A.

Stanford, Calif.; and Charlottesville
and Norfolk, Va.

Background: Plastic surgery has been dedicated to advancing academic surgery in education, research, innovation, and patient care. Thus, as U.S. health care disparities persist, it would be befitting for plastic surgery to assume the lead in alleviating these disparities. As part of a multifaceted approach to ameliorate health care disparities, increasing diversity in the health care workforce will be imperative. Investigating the demographics of the U.S. plastic surgery residents and faculty can bring attention to a deficit that, if corrected, could benefit the field and improve the entire health care system.

Methods: Medical students, plastic surgery residents/fellows, and plastic surgery faculty demographic information from 1966 to 2006 was analyzed from the Association of American Medical Colleges' data files.

Results: Caucasians encompass 68.7 percent of U.S. plastic surgery residents/fellows, while Asian-, African-, and Latino-Americans encompass 20.9, 3.7, and 6.2 percent, respectively. Caucasians comprise 74.9 percent of academic plastic surgeons, while Asian-, African-, and Latino-Americans comprise 10.9, 1.4, and 3.6 percent, respectively. Caucasians constitute 82.0 percent of tenured full professors, while Asian-, African-, and Latino-Americans constitute 4.9, 1.6, and 4.9 percent, respectively. In 2004, African-Americans and Latino-Americans comprised 3.6 percent and 5.7 percent of all U.S. plastic surgeons, but only 1.5 percent and 4.9 percent of plastic academicians, respectively.

Conclusions: Over the last 40 years, plastic surgery has been ineffective in adequately increasing the number of minority residents and faculty. Expanding the number of minority academic plastic surgeons could establish a health care environment more accommodating to minority patients, increase studies highlighting minority health needs, and provide additional role models and mentors. (*Plast. Reconstr. Surg.* 123: 1618, 2009.)

Dedication to patient care, resident education, state-of-the-art techniques, and evidence-based research continue to be the sustainable competitive advantage for plastic surgeons.¹ In a time when health care disparities persist as a significant problem facing the United States, it is only appropriate that plastic surgery take the lead in establishing the means by which these disparities can be resolved.

New evidence suggests that solely improving access to health care may be insufficient in eliminating health care disparities.² It is likely that improving

access, expanding research in health care disparities, and increasing diversity in the health care workforce will all be necessary to resolve these inequalities. Particularly, we believe that enhancing diversity in the health care workforce deserves additional attention. Numerous articles point to a persistent lack of diversity in the health care workforce as an issue that is imperative to resolve to diminish health care disparities.³⁻¹⁰ From patients' heightened comfort under the care of underrepresented minority physicians,^{5,11-13} to underrepresented minority physicians' history of more readily serving underserved communities than their nonminority colleagues,^{5,6,14,15} there is

From the Department of Surgery, Stanford University; Department of Surgery, University of Virginia School of Medicine; and Department of Surgery, Eastern Virginia Medical School.

Received for publication May 19, 2008; accepted September 29, 2008.

Copyright ©2009 by the American Society of Plastic Surgeons

DOI: 10.1097/PRS.0b013e3181a07610

Disclosure: *None of the authors has any relevant financial relationships with any commercial interests as they pertain to this article.*

compelling evidence pointing to a need for improving diversity in the U.S. health care workforce. The lack of representation of underrepresented minority physicians and surgeons in the United States is troubling, yet historical, making it even more disconcerting that minimal progress in remedying this long-standing deficit has been made.

The academic medicine leadership in the United States has traditionally been void of minority representation. Academic plastic surgery has mirrored this custom as it has grossly underrepresented the demographics of its patient population. As with other surgical disciplines, plastic surgery has fielded accusations of health care disparities between Caucasians and underrepresented minorities.^{16–22} With implications of partiality in patient care to concerns over insufficient amounts of clinical and basic science research into ethnically specific conditions, medicine as a whole has inadequately provided attention to the vast community it is called to serve.^{16–27} As mentioned previously, it is suggested that a strategy to help diminish health care disparities in the United States entails establishing a health care workforce more reflective of the general U.S. population.

Determining the demographics of the U.S. plastic surgery residents and faculty could bring attention to a deficit that, if corrected, could change the face of the field and positively impact the entire health care system. We predicted that the number of underrepresented minority (namely African-American and Latino-Americans) plastic surgery residents and faculty is significantly lower than that of their Caucasian counterparts, fallaciously reflecting the changing demographics of the U.S. population. We also hypothesized that African-Americans and Latino-Americans constitute a disproportionate percentage of plastic surgeons in the United States and that this disparity is heightened in academic plastic surgery. Lastly, we speculated that the number of African-American and Latino-American plastic surgery junior faculty and tenured full professors is the lowest among all medical disciplines including general surgery as a whole.

METHODS

Demographic information was obtained for medical student graduates, resident physicians, and medical school faculty for 1966 to 2006 from the data files of the Association of American Medical Colleges (AAMC). The AAMC has several data warehouses that possess information regarding the medical school matriculants, resident physicians, and faculty members of all 126 U.S. allo-

pathic medical schools. Its intent in gathering this information is to provide institutions with a tool by which they can develop time-series data, create comparative data analyses, track national trends, and institute strategic planning, with the end result of supporting and adhering to accreditation activities.

The variable used was race/ethnicity as defined by the AAMC as white, Asian, black, Mexican-American, Cuban, Other Hispanic, Native and Hawaiian American, and Other. For simplicity we combined the Mexican-, Cuban-, and Other Hispanic-American groups into one Latino group. In addition, the extremely small Native and Hawaiian Americans' groups were combined with the Other group. It is recognized that there are increasing efforts to include categories that take into account multiracial individuals; however, these additional subgroups had yet to be implemented at the time these data were collected. The AAMC data books from 1992 to 2006 were used to gather the demographic information on medical school matriculants and graduates.²⁸ Additional information regarding African-American medical student matriculants dating back to 1966 was collected from the *Journal of Blacks in Higher Education*.²⁹

Resident/fellow demographic information for the year 2004 was the most current available and was retrieved from the AAMC Diversity in the Workforce: Facts and Figures 2006.³⁰ Demographic information for medical faculty was retrieved from its 2006 Faculty Roster.^{31,32} The AAMC provided additional demographic information regarding the plastic surgery faculty dating from 1966 to 2006, via written request.³²

National demographic information was collected from the 2006 U.S. population projections gathered by the U.S. Census Bureau to determine whether the medical students, plastic surgery residents/fellows, and faculty were reflective of the U.S. population.³³ To evaluate the demographics of the entire plastic surgery workforce in relation to the academic plastic surgery community, information was also collected from AAMC Diversity in the Workforce: Facts and Figures 2006.³⁰

Data were analyzed for medical students, plastic surgery residents/fellows, junior faculty, and tenured full professors in comparison to the general U.S. population using the *t* test. Statistical significance was determined if the *p* value was less than 0.001.

RESULTS

Plastic Surgery Faculty and Residents/Fellows

Data analyzed from the AAMC 2006 Faculty Roster revealed that the plastic surgery faculty dra-

matically misrepresents the overall U.S. population (Table 1).³² Caucasians constitute 74.9 percent of all plastic surgery faculty, while Asian-, African-, and Latino-Americans comprise 10.9, 1.4, and 3.6 percent, respectively. As a result, both Caucasians and Asian-Americans are overrepresented, while the African-Americans and Latino-Americans are significantly underrepresented ($*p < 0.001$).

There is a statistically significant difference in the demographics of plastic surgery residents/fellows when compared with the overall U.S. population (Table 1).³⁰ Caucasians were comparably represented (66.4 percent of population versus 68.7 percent of residents), Asian-Americans were overrepresented (4.3 percent of population versus 20.9 percent of residents), and both African-Americans and Latino-Americans were underrepresented (12.3 percent of population versus 3.7 percent of residents, and 14.8 percent of population versus 6.2 percent of residents), respectively ($*p < 0.001$). The majority of the Other group (0.5 percent of all plastic and reconstructive surgery residents/fellows) consisted of international medical graduates.

U.S. Plastic Surgery Tenured Full Professors

The current cohort of plastic surgery tenured full professors also significantly misrepresents the general U.S. population (Table 1).³² Caucasians are dramatically overrepresented as they comprise 82.0 percent of full professors. Asian-Americans are comparably represented at 4.9 percent, although this is notably lower than their percentage of overall plastic surgery faculty previously mentioned (10.9 percent). African-Americans and Latino-Americans, particularly African-Americans, are exceedingly underrepresented among full professors of plastic surgery at 1.6 percent and 4.9 percent, respectively ($*p < 0.001$).

Academia versus Overall Workforce

The most current data collected regarding the overall U.S. plastic surgery workforce were from 2004. The demographics of the plastic surgery workforce (private practitioners and academicians) are exceedingly disproportionate to the U.S. population as a whole.³⁰ In 2004, Caucasians and Asian-Americans were overrepresented at 71.5 percent and 11.7 percent, respectively; however, African-Americans and Latino-Americans were underrepresented at 3.6 percent and 5.7 percent, respectively (Table 2). Underrepresentation of African-Americans and Latino-Americans was even

Table 1. Demographics of U.S. Medical Student Graduates, Plastic and Reconstructive Surgery Residents, and Plastic and Reconstructive Surgery Faculty Compared with Overall U.S. Population (2006)

	U.S. Population ^{33,34} (%)	U.S. Medical School Graduates ^{28,34} (%)*	U.S. Plastic and Reconstructive Surgery Residents and Fellows ³⁰ (%)**†	U.S. Plastic and Reconstructive Surgery Faculty ³² (%)*	U.S. Plastic and Reconstructive Surgery Tenured Professors ³² (%)*
Caucasian	199,744,494/299,398,484 (66.4)	10,030/15,810 (63.4)	421/613 (68.7)	158/211 (74.9)	50/61 (82.0)
Asian-American	12,881,639/299,398,484 (4.3)	3232/15,810 (20.4)	128/613 (20.9)	23/211 (10.9)	3/61 (4.9)
African-American	36,689,680/299,398,484 (12.3)	1122/15,810 (7.1)	23/613 (3.7)	3/211 (1.4)	1/61 (1.6)
Latino-American	44,321,038/299,398,484 (14.8)	1063/15,810 (6.7)	38/613 (6.2)	12/211 (3.6)	3/61 (4.9)
Other	5,987,969/299,398,484 (2.2)	363/15,810 (2.3)	3/613 (0.5)	15/211 (7.1)	4/61 (6.5)

*Statistically significant compared to overall U.S. population ($*p < 0.001$).
 †Most current data available was from 2004.

Table 2. Comparison of All U.S. Plastic and Reconstructive Surgeons versus U.S. Academic Plastic and Reconstructive Surgeons (2004)

	All U.S. Plastic and Reconstructive Surgeons ³⁰ (%)	Academic U.S. Plastic and Reconstructive Surgeons ³² (%)
Caucasian	2868/4011 (71.5)	158/202 (78.2)
Asian-American	468/4011 (11.7)	19/202 (9.4)
African-American	143/4011 (3.6)	3/202 (1.5)
Latino-American	225/4011 (5.7)	10/202 (4.9)
Other	289/4011 (7.2)	12/202 (5.9)

more apparent when evaluating the number of academic plastic surgeons in 2004.³² As previously mentioned, African-Americans and Latino-Americans comprised 3.6 percent and 5.7 percent of all U.S. plastic surgeons, respectively, but only 1.5 percent and 4.9 percent of academic plastic surgeons, respectively, in 2004.

Faculty Demographic Comparison among All Medical Disciplines

To determine whether this deficit in under-represented minorities was unique to the plastic surgery faculty or if it was evident in the other medical disciplines as well, demographic information was compared. Despite the field of surgery having the lowest percentage of African-Americans and Latino-Americans represented within their faculty, African-Americans' representation within the subspecialty of plastic surgery was even more scarce (1.4 percent) (Table 3).^{31,32,34} Latino-Americans had a comparable number of plastic tenured full professors when compared with the other disciplines, but the absolute numbers reveal that there were only three of these individuals reported in the entire country in 2006. Plastic surgery divisions/departments had the third lowest percentage of African-American tenured full professors (1.6 percent) when compared with all other disciplines. More pointedly, it was reported that there are only three African-American plastic surgery academicians and one tenured full professor in the United States in 2006, indicating that the absolute numbers should not be overlooked (Table 3).

DISCUSSION

It is projected that by the year 2030, under-represented minorities will comprise greater than 35 percent of the U.S. population. Currently, African-, Latino-, Asian-, and Native-Americans constitute 33.6 percent of this nation's citizens, generating the need for a system that ensures effective

Table 3. Percentage of African-American and Latino-American Plastic and Reconstructive Surgery Faculty versus African-American and Latino-American Faculty from Other Medical Disciplines (2006)^{31,32,34}

Ethnicity/Academic Position	Plastic and Reconstructive Surgery	Surgery*	Family Practice	Pediatrics	Anesthesiology	Internal Medicine	Obstetrics/Gynecology
African-American faculty (%)	3/211 (1.4)	415/13,901 (2.9)	254/4172 (6.1)	474/13,757 (3.4)	202/5626 (3.6)	889/28,696 (3.1)	329/4340 (7.6)
African-American tenured professors (%)	1/61 (1.6)	67/3661 (1.8)	14/553 (2.5)	34/2878 (1.2)	16/830 (1.9)	76/6457 (1.2)	26/876 (3.0)
Latino-American faculty (%)	12/211 (3.6)	508/13,901 (3.6)	232/4172 (5.6)	677/13,757 (4.9)	239/5626 (4.2)	1244/28,696 (4.3)	202/4340 (4.7)
Latino-American tenured professors (%)	3/61 (4.9)	99/3661 (2.7)	18/553 (3.3)	99/2878 (3.4)	12/830 (1.4)	183/6457 (2.8)	38/876 (4.3)

*Includes general, orthopedic, otorhinolaryngology, urology, plastic and reconstructive, cardiothoracic, vascular and transplant surgery, and neurosurgery.

and nondiscriminatory health care even more important.³³ Consistent with the demographics of the overall health provider workforce, the U.S. plastic surgery community strongly misrepresents the patient population in which it is responsible for caring. Despite strides made by underrepresented minorities regarding their increased matriculation into medical schools since the 1960s, African-Americans and Latino-Americans have gained minimal ground in plastic surgery both in private practice and academia.³⁵

The Need for Diversity

Health Care Disparities and Improving Access to Care

There is not a specialty within the field of surgery that is devoid of documented evidence of racial disparities. The thoracic and cardiovascular,^{36–42} oncologic,^{43–45} colorectal,⁴⁶ orthopedic,^{47,48} pediatric,⁴⁹ transplant,^{50–56} urologic,⁵⁷ and neurosurgical⁵⁸ subspecialties have all identified portions of their practices that are potentially discriminating to underrepresented minorities.³⁴

Despite advances in breast reconstruction techniques, several recent studies revealed that African-American women underwent postmastectomy breast reconstruction at significantly lower rates compared with Caucasian women.^{16–18} Another study revealed that the rate of breast reconstruction after mastectomy for African-American women was lower at every age interval than that for Caucasians, even after adjusting for cancer stage and the patients' socioeconomic status.^{17,19} This takes on even greater significance when one considers that it was recently determined that the prevalence of the *BRCA1* mutation was heightened in young African-American women compared with other ethnic groups and that there is evidence that underrepresented minority women are offered breast-conserving surgery for early-stage cancer less often than their Caucasian counterparts.^{45,59} This, in aggregate, represents a glaring health care disparity. There are no clear data pinpointing whether these discrepancies are due to lack of referral, unsuccessful communication to patients about treatment options, plastic surgeons' bias, or simply patient preference; however, the evidence is clear that underrepresented minorities are, in general, not receiving equal treatment for this condition and it necessitates alleviation.

In an analysis of 1461 fire and burn-related fatalities in children under age 19, African-American and Native-American children were more likely to die in a house fire than Caucasian children.^{20,21}

There were concerns that this study was flawed because it was presumed that more underrepresented minority children were involved in the fires; however, a smaller study was performed to evaluate this, and it was determined that the racial distribution of their sample of underrepresented minority children with burn injuries was not significantly different from that of the general population.^{20,22} The literature suggests that because it is documented that underrepresented minority children often receive inferior health care compared with Caucasian children,^{20,60} it is possible that emergent medical teams, trauma surgeons, and plastic surgeons have provided less than optimal treatment to these patients.²⁰

According to the American Society of Aesthetic Plastic Surgery, of the 11.9 million cosmetic procedures performed in the United States in 2004, only 20 percent of those were performed on non-Caucasians.⁶¹ Asian-, African-, and Latino-American patients constituted 4.6, 6.2, and 8.5 percent of all cosmetic surgery cases in the United States, respectively.⁶¹ These data suggest that because the U.S. population contains almost 35 percent non-Caucasian citizens, there is a significant population of potential cosmetic surgery patients who are untapped.

Plastic surgeons have created ideal norms of beauty based on the majority Caucasian population due in part to a limited number of underrepresented minorities seeking cosmetic procedures. Historically, concerns from underrepresented minorities were that if they were to opt for plastic surgery, the surgeon would only be able to change it in a way that would not be aesthetically acceptable within the patient's community. A specific example of this is the increasingly referenced open rhinoplasty procedure. The distinct anatomic characteristics of the African-American nose require a highly specific and unique approach by plastic surgeons that is unlike that used to recreate the Caucasian nose.⁶² Surgeons who have been appropriately trained in taking this into account make sure to carefully modify the nose while establishing a cosmetic result that allows the patient to maintain their ethnic eminence. Heir et al.⁶³ suggest that as the number of cosmetic procedures performed on underrepresented minorities increases, the more comfortable surgeons will become with their own understanding of ethnic beauty as well as the specific aesthetic considerations for this cohort of patients. Consequently, this adaptation would likely lead to increased referrals as underrepresented minority patients would become more educated about treatment

options and more comfortable seeking out treatment, if they had members of their own community satisfied with the results.^{63,64}

Underrepresented Minority Patients' Perspective and Underrepresented Minority Physicians' Practice Trends

Documented evidence reveals that underrepresented minorities believe that they receive superior health care when it is performed by a racially concordant physician.^{5,12,13,65} In addition, there is further evidence suggesting that when given the opportunity, underrepresented minority patients are more likely to select health care professionals of their own race.^{11,13,66,67} Cultural barriers in patient-physician communication have been documented, as efforts to acknowledge and more appropriately recognize the behavioral and environmental influences that affect various patient populations have not been adequately embraced.^{3,65,68–71} The lack of an ethnically accommodating environment leads many underrepresented minorities to be hesitant to seek treatment by a racially discordant surgeon. Thus, instead of receiving care from a potentially culturally insensitive surgeon, many underrepresented minorities are electing to seek no treatment at all.

Increasing the number of underrepresented minority plastic surgeons could be extremely conducive to providing additional members of this patient population with culturally sensitive care. It is repeatedly cited that underrepresented minority physicians are more likely than Caucasian physicians to treat Medicaid patients, patients without health insurance, and patients of color and to practice in underserved communities.^{6,14,15,72,73} Thus, if underrepresented minority physicians want to serve this patient population and this patient population prefers to be served by underrepresented minority physicians, it appears that one means of diminishing disparities in the care for underrepresented minorities is by training more underrepresented minority surgeons and physicians.

Enhancing Research and Increasing the Number of Mentors

Many clinical trials have been considered inadequate because they do not contain an ethnically diverse cohort of trial subjects. Underrepresented minorities, particularly in the African-American community, relate clinical trials to the Tuskegee project of the 1930s that even to this day conjure thoughts of deception and mistreatment.⁷⁴ A recent article revealed that, similar to patient care

preferences, African-Americans and Latino-Americans were more likely to participate in clinical research if a minority physician/academician is on the investigative team.^{23–25} Thus, by increasing the number of underrepresented minority academic plastic surgeons, it is possible that there would be a corresponding increase in investigative studies highlighting minority-specific health care needs, such as keloid treatment. This is in line with the AAMC statement in 2003 regarding the Supreme Court's ruling in *Grutter v. Bollinger et al.* that a more diverse physician workforce would provide the underserved populations with greater access to physicians who share their ethnic heritage and encourage them to conduct additional research into ways to eliminate racial health care disparities.^{75,76}

A concerning finding in our Results section is that the percentage of underrepresented minorities that constitute each successive step along the career path to a position in academic plastic surgery becomes increasingly smaller (Table 1). In marked contrast, the percentage of Caucasians that comprise members of each step along the path to a career in academic plastic surgery becomes increasingly larger. Significant aims have been made at increasing underrepresented minority medical student enrollment with limited success. With the onset of the civil rights movement and subsequent initiatives like the AAMC's 3000 in 2000, African-American medical school enrollment increased from 3 percent before 1960 to its current level of slightly above 7 percent (Fig. 1).^{28,34} Although this is an improvement, one must acknowledge that even after these exhaustive efforts, the representation of underrepresented minority in U.S. medical schools falls substantially short of the goal of providing this country with a future medical workforce that is reflective of the U.S. population.

Recruitment solely at the medical student level is not sufficient in improving the demographics; thus, we believe that a shift in focus to the leadership level may be advantageous. Dedication to active recruitment of underrepresented minority plastic surgeons by medical institutions serves two beneficial purposes. First, by taking them on as staff, medical institutions would be increasing the number of minority plastic surgeons available to serve the community as a whole; and, second, medical institutions would be establishing a group of people who could serve as mentors for future underrepresented minority plastic surgeons.

There is increasing evidence that mentorship plays a significant role in the career deci-

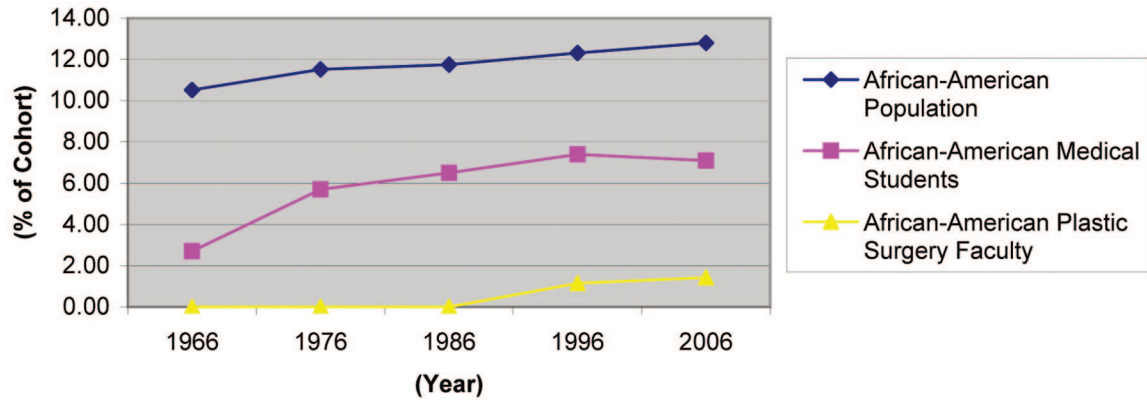


Fig. 1. Historical trends from 1966 to 2006 of the percentage of African-Americans that comprise the U.S. population, U.S. medical student matriculants, and U.S. plastic and reconstructive surgery faculty.^{28,29,32-34}

sions of medical students and residents, as well as the recruitment of young people into scientific fields.⁷⁷⁻⁸⁵ The educational literature describes the primary deterrent of underrepresented minority youth seeking careers in the sciences, math, or information technology as the lack of professional role models and mentors.⁸⁶⁻⁹⁰ To be clear, we are not suggesting that nonminority physicians are incapable of serving as role models for underrepresented minority students and residents, because some have dedicated their careers to it. As with minority patients, there are some underrepresented minority students and residents, however, that attest that an ethnically similar role model will better understand their perspective, as it is likely that they too faced many of the same cultural obstacles throughout their careers. Additional findings from the education literature state that a substantial impediment to underrepresented minority student learning is the lack of positive images or reassuring social illustrations.⁹¹ Thus, for some underrepresented minority young people, it is truly invaluable for them to have exposure to real-life examples to surmise that they too can achieve.

Increasing the representation of underrepresented minority academic plastic surgeons will undoubtedly benefit underrepresented minority residents and students while also enriching the entire discipline, as Caucasian faculty could also gain insight into culturally sensitive issues. Moreover, a less homogenous plastic surgery faculty will provide significant educational and cultural exposure to medical students of all kindred, causing them to be more ethnically and racially cognizant future physicians and surgeons.

Data Accuracy

We fully acknowledge that this faculty demographic information was obtained from a historical database most recently updated in 2007. Thus, we recognize that it may not be exactly representative of 2008. With that being said, the data presented were obtained from the largest, and most historic, independent agency that has assumed the responsibility of gathering the demographic information of medical students, residents, and faculty in the United States, the AAMC. To capture the most current data, we recommend a follow-up study that surveys the plastic surgery division/department chairmen regarding the demographics of their faculty during the 2008 to 2009 academic year.

Possible Methods for Improvement

We would be remiss if we did not reiterate that the intention of this study is purely to bring statistically supported attention to an aspect of academic plastic surgery that could be improved. We also recognize that plastic surgery is not alone in its deficit of underrepresented minority residents and faculty, as all disciplines have insufficient representation relative to the general population. Due to the fact, however, that plastic surgery has historically been in the forefront of advancing surgery and medicine as a whole, we believe that progress toward a more heterogeneous health care work force could also be led by plastic surgery. By no means are we suggesting that academic standards or legitimate hiring practices be compromised to compensate for this deficit; however, we are confident that more can be done.

Dedication to the active recruitment of minority residents and plastic surgery faculty is im-

perative. The heightened interest that the field portrays to prospective minority candidates will assuredly lead to increased applications and interest by those underrepresented minority groups. Additionally, plastic surgery leadership can further establish mentorship programs for young aspiring underrepresented minority medical students and residents as a means of further enlightening them about the possibilities of a career in academic plastic surgery. It is possible that organizations like the American Association of Plastic Surgeons and the American Society of Plastic Surgeons could generate an increased alliance or preceptorship program with organizations such as the National Medical Association or the Society of Black Academic Surgeons to facilitate more exposure and a more inviting environment for underrepresented minority medical students, residents, and faculty. We do not pretend to have all of the answers for this problem; however, if plastic surgery could lead the way in this endeavor, it would speak volumes.

Paris D. Butler, M.D., M.P.H.
 Department of Surgery
 Stanford University
 257 Campus Drive, RM 110
 Stanford, Calif. 94305
 parisb@stanford.edu

ACKNOWLEDGMENTS

The authors acknowledge Hershel Alexander, Ph.D., and Yolanda Vogel, D.D.M., of the AAMC for providing selected AAMC Faculty Roster information for this article. In a cost-sharing agreement with the AAMC, the National Institutes of Health partially supports the AAMC Faculty Roster under contract N01-OD-3-1015.

In addition, the authors thank Lonnie Snowden, Ph.D., and Iman Nazeeri-Simmons, M.P.H., at University of California, Berkeley School of Public Health for their guidance and direction during this process.

REFERENCES

1. Longaker MT, Rohrich RJ. Innovation: A sustainable competitive advantage for plastic and reconstructive surgery. *Plast Reconstr Surg.* 2005;115:2135–2136.
2. Strategic Research Plan and Budget to Reduce and Ultimately Eliminate Health Disparities. National Institutes of Health, US Department of Health and Human Services, Bethesda, Md. 2002:1–31.
3. Reede JY. A recurring theme: The need for minority physicians. *Health Aff (Millwood)* 2003;22:91–93.
4. Lakhan SE. Diversification of U.S. medical schools via affirmative action implementation. *BMC Med Educ.* 2003;3:6.
5. Sarto G. Of disparities and diversity: Where are we? *Am J Obstet Gynecol.* 2005;192:1188–1195.
6. Komaromy M, Grumbach K, Drake M, et al. The role of black and Hispanic physicians in providing health care for underserved populations. *N Engl J Med.* 1996;334:1305–1310.

7. Nickens HW, Ready TP, Petersdorf RG. Project 3000 by 2000: Racial and ethnic diversity in U.S. medical schools. *N Engl J Med.* 1994;331:472–476.
8. Valcarcel M, Diaz C, Santiago-Borrero PJ. Training and retaining of underrepresented minority physician scientists—a Hispanic perspective: NICHD-AAP workshop on research in neonatology. *J Perinatol.* 2006;26 Suppl 2:S49–S52.
9. Chen FM, Fryer GE Jr, Phillips RL Jr, Wilson E, Pathman DE. Patients’ beliefs about racism, preferences for physician race, and satisfaction with care. *Ann Fam Med.* 2005;3:138–143.
10. Heron S, Haley L Jr. Diversity in emergency medicine: A model program. *Acad Emerg Med.* 2001;8:192–195.
11. Saha S, Taggart SH, Komaromy M, Bindman AB. Do patients choose physicians of their own race? *Health Aff (Millwood)* 2000;19:76–83.
12. Saha S, Komaromy M, Koepsell TD, Bindman AB. Patient-physician racial concordance and the perceived quality and use of health care. *Arch Intern Med.* 1999;159:997–1004.
13. Laveist TA, Nuru-Jeter A. Is doctor-patient race concordance associated with greater satisfaction with care? *J Health Soc Behav.* 2002;43:296–306.
14. Rabinowitz HK, Diamond JJ, Veloski JJ, Gayle JA. The impact of multiple predictors on generalist physicians’ care of underserved populations. *Am J Public Health* 2000;90:1225–1228.
15. Moy E, Bartman BA. Physician race and care of minority and medically indigent patients. *J.A.M.A.* 1995;273:1515–1520.
16. Tseng JF, Kronowitz SJ, Sun CC, et al. The effect of ethnicity on immediate reconstruction rates after mastectomy for breast cancer. *Cancer* 2004;101:1514–1523.
17. Zweifler M, Rodriguez E, Reilly J, Lewis T, Glasberg SB. Breast reconstruction among inner city women with breast carcinoma. *Ann Plast Surg.* 2001;47:53–59.
18. Ganz PA, Rowland JH, Desmond K, Meyerowitz BE, Wyatt GE. Life after breast cancer: Understanding women’s health-related quality of life and sexual functioning. *J Clin Oncol.* 1998;16:501–514.
19. Polednak AP. Postmastectomy breast reconstruction in Connecticut: Trends and predictors. *Plast Reconstr Surg.* 1999;104:669–673.
20. Joseph KE, Adams CD, Goldfarb IW, Slater H. Parental correlates of unintentional burn injuries in infancy and early childhood. *Burns* 2002;28:455–463.
21. McLoughlin E, McGuire A. The causes, cost, and prevention of childhood burn injuries. *Am J Dis Child.* 1990;144:677–683.
22. Libber SM, Stayton DJ. Childhood burns reconsidered: The child, the family, and the burn injury. *J Trauma* 1984;24:245–252.
23. Branson RD, Davis K Jr, Butler KL. African Americans’ participation in clinical research: Importance, barriers, and solutions. *Am J Surg.* 2007;193:32–39; discussion 40.
24. Corbie-Smith G, Thomas SB, Williams MV, Moody-Ayers S. Attitudes and beliefs of African Americans toward participation in medical research. *J Gen Intern Med.* 1999;14:537–546.
25. Corbie-Smith G, Thomas SB, St George DM. Distrust, race, and research. *Arch Intern Med.* 2002;162:2458–2463.
26. Butler PD, Longaker MT, Yang GP. Current progress in keloid research and treatment. *J Am Coll Surg.* 2008;206:731–741.
27. Sickle Cell Disease Association of America, Inc. Press Release, April 28, 2008. “SCDAA and NHLBI Address the Realignment of the Sickle Cell Disease Comprehensive Centers.” Available at: http://www.sicklecelldisease.org/docs/Press_Release_SCDAA_NHLBI_Address_the_Realignment%20Final%2004%2028%2008.doc. Accessed April 7, 2008.
28. Association of American Medical Colleges. AAMC Data Book: 1992–2006 Facts: Applicants, Matriculants, Gradu-

- ates. Available at: <http://www.aamc.org/data/facts/start.htm>. Accessed November 12, 2007.
29. Cross T, Slater RB. A quarter-century of black progress in medical school education. *J Blacks Higher Educ*. 1997;15:18–22.
 30. Association of American Medical Colleges. AAMC Diversity in the Workforce: Facts and Figures 2006. In: AAMC; Available at: https://services.aamc.org/Publications/showfile.cfm?file=version79.pdf&prd_id=161&prv_id=191&pdf_id=9. Accessed November 12, 2007.
 31. Association of American Medical Colleges. AAMC Faculty Roster 2006. Available at: <http://www.aamc.org/data/facultyroster/reports.htm>. Accessed November 12, 2007.
 32. Association of American Medical Colleges. AAMC Plastic Surgery Faculty Roster 1966–2006. Provided by the AAMC's Faculty Data Systems and Studies Technical Support Analyst via written request to halexander@aamc.org. Received and accessed February 11, 2008.
 33. US Census Bureau: Population Division. Available at: <http://www.census.gov/popest/national/asrh/NC-EST2006/NC-EST2006-03.xls>. Accessed November 12, 2007.
 34. Butler PD, Longaker MT, Britt LD. Major deficit in the number of underrepresented minority academic surgeons persists. *Ann Surg*. (in press).
 35. Andriole DA, Jeffe DB, Schechtman KB. Is surgical workforce diversity increasing? *J Am Coll Surg*. 2007;204:469–477.
 36. Wenneker MB, Epstein AM. Racial inequalities in the use of procedures for patients with ischemic heart disease in Massachusetts. *J.A.M.A.* 1989;261:253–257.
 37. Ayanian JZ, Udvarhelyi IS, Gatsonis CA, Pashos CL, Epstein AM. Racial differences in the use of revascularization procedures after coronary angiography. *J.A.M.A.* 1993;269:2642–2646.
 38. Whittle J, Conigliaro J, Good CB, Lofgren RP. Racial differences in the use of invasive cardiovascular procedures in the Department of Veterans Affairs medical system. *N Engl J Med*. 1993;329:621–627.
 39. Peterson ED, Shaw LK, DeLong ER, Pryor DB, Califf RM, Mark DB. Racial variation in the use of coronary-revascularization procedures: Are the differences real? Do they matter? *N Engl J Med*. 1997;336:480–486.
 40. Oddone EZ, Horner RD, Monger ME, Matchar DB. Racial variations in the rates of carotid angiography and endarterectomy in patients with stroke and transient ischemic attack. *Arch Intern Med*. 1993;153:2781–2786.
 41. Guadagnoli E, Ayanian JZ, Gibbons G, McNeil BJ, LoGerfo FW. The influence of race on the use of surgical procedures for treatment of peripheral vascular disease of the lower extremities. *Arch Surg*. 1995;130:381–386.
 42. Bach PB, Cramer LD, Warren JL, Begg CB. Racial differences in the treatment of early-stage lung cancer. *N Engl J Med*. 1999;341:1198–1205.
 43. Ball JK, Elixhauser A. Treatment differences between blacks and whites with colorectal cancer. *Med Care* 1996;34:970–984.
 44. Bickell NA, Wang JJ, Oluwole S, et al. Missed opportunities: Racial disparities in adjuvant breast cancer treatment. *J Clin Oncol*. 2006;24:1357–1362.
 45. Michalski TA, Nattinger AB. The influence of black race and socioeconomic status on the use of breast-conserving surgery for Medicare beneficiaries. *Cancer* 1997;79:314–319.
 46. Cooper GS, Yuan Z, Landefeld CS, Rimm AA. Surgery for colorectal cancer: Race-related differences in rates and survival among Medicare beneficiaries. *Am J Public Health* 1996;86:582–586.
 47. Wilson MG, May DS, Kelly JJ. Racial differences in the use of total knee arthroplasty for osteoarthritis among older Americans. *Ethn Dis*. 1994;4:57–67.
 48. Giacomini MK. Gender and ethnic differences in hospital-based procedure utilization in California. *Arch Intern Med*. 1996;156:1217–1224.
 49. Kokoska ER, Bird TM, Robbins JM, Smith SD, Corsi JM, Campbell BT. Racial disparities in the management of pediatric appendicitis. *J Surg Res*. 2007;137:83–88.
 50. Ayanian JZ, Cleary PD, Weissman JS, Epstein AM. The effect of patients' preferences on racial differences in access to renal transplantation. 1999; *N Engl J Med*. 341:1661–1669.
 51. Kjellstrand CM. Age, sex, and race inequality in renal transplantation. *Arch Intern Med*. 1988;148:1305–1309.
 52. Held PJ, Pauly MV, Bovbjerg RR, Newmann J, Salvatierra O Jr. Access to kidney transplantation: Has the United States eliminated income and racial differences? *Arch Intern Med*. 1988;148:2594–2600.
 53. Eggers PW. Racial differences in access to kidney transplantation. *Health Care Financ Rev*. 1995;17:89–103.
 54. Soucie JM, Neylan JF, McClellan W. Race and sex differences in the identification of candidates for renal transplantation. *Am J Kidney Dis*. 1992;19:414–419.
 55. Alexander GC, Sehgal AR. Barriers to cadaveric renal transplantation among blacks, women, and the poor. *J.A.M.A.* 1998;280:1148–1152.
 56. Gaylin DS, Held PJ, Port FK, et al. The impact of comorbid and sociodemographic factors on access to renal transplantation. *J.A.M.A.* 1993;269:603–608.
 57. Anger J, Rodriguez LV, Wang Q, Chen E, Pashos C, Litwin MS. Racial disparities in the surgical management of stress incontinence among female medicare beneficiaries. *J Urol*. 2007;177:1846–1850.
 58. Williams Z, Curry WT, Eskandar E, Barkar F. Racial and socioeconomic disparities in the surgical treatment of Parkinson disease in the United States, 1997–2003. *Neurosurgery* 2006;59:473.
 59. John EM, Miron A, Gong G, et al. Prevalence of pathogenic BRCA1 mutation carriers in 5 US racial/ethnic groups. *J.A.M.A.* 2007;298:2869–2876.
 60. Lieu TA, Newacheck PW, McManus MA. Race, ethnicity, and access to ambulatory care among US adolescents. *Am J Public Health* 1993;83:960–965.
 61. Babbit A. (February 17, 2005). 11.9 Million Cosmetic Procedures in 2004. Press Release. *The American Society for Aesthetic Plastic Surgery*. Available at: www.surgery.org/press/news-release.php?iid=395. Accessed April 11, 2008.
 62. Rohrich RJ, Muzaffar AR. Rhinoplasty in the African-American patient. *Plast Reconstr Surg*. 2003;111:1322–1339; discussion 1340–1321.
 63. Heir JS, Sandhu BS, Barber HD. Considerations for esthetic facial surgery in the African-American patient. *Atlas Oral Maxillofac Surg Clin North Am*. 2000;8:113–125.
 64. Haynes M. More minorities opt for cosmetic surgery. *Pittsburgh Post-Gazette*, August 6, 2006.
 65. Cooper-Patrick L, Gallo JJ, Gonzales JJ, et al. Race, gender, and partnership in the patient-physician relationship. *J.A.M.A.* 1999;282:583–589.
 66. LaVeist TA, Nuru-Jeter A, Jones KE. The association of doctor-patient race concordance with health services utilization. *J Public Health Policy* 2003;24:312–323.
 67. Gray B, Stoddard JJ. Patient-physician pairing: Does racial and ethnic congruity influence selection of a regular physician? *J Community Health* 1997;22:247–259.
 68. Kleinman A, Eisenberg L, Good B. Culture, illness, and care: Clinical lessons from anthropologic and cross-cultural research. *Ann Intern Med*. 1978;88:251–258.

69. Lurie N, Yergan J. Teaching residents to care for vulnerable populations in the outpatient setting. *J Gen Intern Med.* 1990; 5(1 Suppl):S26-S34.
70. Mull JD. Cross-cultural communication in the physician's office. *West J Med.* 1993;159:609-613.
71. Quill TE. Recognizing and adjusting to barriers in doctor-patient communication. *Ann Intern Med.* 1989;111:51-57.
72. Cantor JC, Miles EL, Baker LC, Barker DC. Physician service to the underserved: Implications for affirmative action in medical education. *Inquiry* 1996;33:167-180.
73. Xu G, Fields SK, Laine C, Veloski JJ, Barzansky B, Martini CJ. The relationship between the race/ethnicity of generalist physicians and their care for underserved populations. *Am J Public Health* 1997;87:817-822.
74. Macready N. US to encourage more black people to join research trials. *Br Med J.* 1997;314:695.
75. Ford HR. Mentoring, diversity, and academic surgery. *J Surg Res.* 2004;118:1-8.
76. Supreme Court Ruling Supports Greater Diversity in Medicine, press release, Association of American Medical Colleges, Washington, DC; 2003.
77. Gargiulo DA, Hyman NH, Hebert JC. Women in surgery: Do we really understand the deterrents? *Arch Surg.* 2006;141: 405-407; discussion 407-408.
78. Park J, Minor S, Taylor RA, Vikis E, Poenaru D. Why are women deterred from general surgery training? *Am J Surg.* 2005;190:141-146.
79. Richardson HC, Redfern N. Why do women reject surgical careers? *Ann R Coll Surg Engl.* 2000;82(9 Suppl):290-293.
80. Gabram SG, Allen LW, Deckers PJ. Surgical residents in the 1990s: Issues and concerns for men and women. *Arch Surg.* 1995;130:24-28.
81. Incorvaia AN, Ringley, CD, Boysen DA. Factors influencing surgical career decisions. *Curr Surg.* 2005;62:429-435.
82. Wilson LD, Flynn DF, Haffty BG. Radiation oncology career decision variables for graduating trainees seeking positions in 2003-2004. *Int J Radiat Oncol Biol Phys.* 2005;62:519-525.
83. Doody M. A mentor is a key to career success. Career development: Practical suggestions for healthcare professionals wanting to develop fruitful mentoring relationship. *Health-care Financial Management* February, 2003.
84. Lawrence J, Poole P, Diener S. Critical factors in career decision making for women medical graduates. *Med Educ.* 2003;37:319-327.
85. Weems R Jr. Race in the academy: Moving beyond diversity and toward the incorporation of faculty of color in predominantly white colleges and universities. *J Black Stud.* 2003;34: 101-111.
86. Zappo L. A demographic survey relevant to earth-science teachers as mentors and role models for minority students. *J Geosci Educ.* 1998;46:368-373.
87. Rivera A. Symposium on minorities and women in science and technology. Symposium Transcript, Washington D.C., ERIC ed. 1981;221:12-14.
88. Otuya EJ. Demand and supply of minority teachers. ERIC Digest 12-88, ERIC Clearinghouse on Teacher Education, Washington D.C., ERIC Ed. 1988;316:3.
89. McDonald J, Clarke M, Dobson E. Increasing the supply of women and minority engineers: An agenda for state action. Executive Summary, National Governors Association, Washington, D.C., ERIC ed. 1990;324:26-30.
90. Sims C. What went wrong: Why programs failed. *Science* 1992; 258:1185-1187.
91. Marshall C. Impediments to minority student learning. *Inquiry* 2002;7:22-34
92. Betancourt JR. Eliminating racial and ethnic disparities in health care: What is the role of academic medicine? *Acad Med.* 2006;81:788-792.



www.editorialmanager.com/prs

Submit your manuscript today through PRS' Enkwell. The Enkwell submission and review website helps make the submission process easier, more efficient, and less expensive for authors, and makes the review process quicker, more accessible, and less expensive for reviewers. If you are a first-time user, be sure to register on the system.