

# Institutional Variation in the Promotion of Racial/Ethnic Minority Faculty at US Medical Schools

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The racial/ethnic composition of the health-care workforce does not reflect the diversity in the US general population. Although combined Blacks and Hispanics represent 28.7% of the total US population,<sup>1</sup> only 8.4% of all practicing US physicians are Black or Hispanic.<sup>2,3</sup> These disparities extend to academic medical center faculty. Historically underrepresented racial/ethnic minorities constitute 7% of all current academic medical center faculty and fewer than 5% of all new academic medical center faculty.<sup>2,4</sup>

The rationale for supporting racial/ethnic diversity across the academic medical center faculty workforce is multifold. Faculty diversity increases the quality of training for all students, and racial/ethnic minority faculty often serve as important professional resources for racial/ethnic minority trainees.<sup>5,6</sup> This is a critical role within the social mission of academic medical centers to develop a diverse practicing physician workforce, which is necessary to reduce healthcare discrimination and increase healthcare access and quality.<sup>7-9</sup> Racial/ethnic minority faculty also often provide leadership in medical education, health policy, and research scholarship related to racial/ethnic health inequities. Despite these benefits, academic medical centers struggle to retain racial/ethnic diversity across faculty ranks.

Institutional discrimination in the promotion process has been suggested as a potential explanation for the persistent lack of diversity at the senior faculty level associate professor and full professor ranks.<sup>10</sup> The majority of Black and Hispanic academic medical center faculty are concentrated at the assistant professor level; among all racial/ethnic groups, men are more likely than are women to hold full professor rank.<sup>4</sup> Aggregated national data have described lower career satisfaction among racial/ethnic minority academic medical center faculty, lower promotion rates compared with

**Objectives.** We compared faculty promotion rates by race/ethnicity across US academic medical centers.

**Methods.** We used the Association of American Medical College's 1983 through 2000 faculty roster data to estimate median institution-specific promotion rates for assistant professor to associate professor and for associate professor to full professor. In unadjusted analyses, we compared medians for Hispanic and Black with White faculty using the Wilcoxon rank sum test. We compared institution-specific promotion rates between racial/ethnic groups with data stratified by institutional characteristic (institution size, proportion racial/ethnic minority faculty, and proportion women faculty) using the  $\chi^2$  test. Our sample included 128 academic medical centers and 88 432 unique faculty.

**Results.** The median institution-specific promotion rates for White, Hispanic, and Black faculty, respectively, were 30.2%, 23.5%, and 18.8% ( $P < .01$ ) from assistant to associate professor and 31.5%, 25.0%, and 16.7% ( $P < .01$ ) from associate to full professor.

**Conclusions.** At most academic medical centers, promotion rates for Hispanic and Black were lower than those for White faculty. Equitable faculty promotion rates may reflect institutional climates that support the successful development of racial/ethnic minority trainees, ultimately improving healthcare access and quality for all patients. (*Am J Public Health.* 2012;102:852–858. doi:10.2105/AJPH.2011.300552)

White peers despite adjustment for established measures of productivity, and decreased likelihood of being awarded research grants from the National Institutes of Health after controlling for several key factors.<sup>10-14</sup> Other research has concluded that many physician academic medical center faculty, particularly racial/ethnic minorities, experience a poor institutional diversity climate or discrimination at work.<sup>15-18</sup> Although recent data demonstrate increases in the overall numbers of first time racial/ethnic minority assistant professors and medical students,<sup>10,19</sup> national averages that reveal lower and slower promotion rates for racial/ethnic minority faculty raise concerns about the success of organizational efforts to successfully diversify the academic medical center faculty workforce.<sup>10,13</sup>

Despite consistent national data on differential career trajectories for racial/ethnic minority academic medical center faculty, it is unknown whether all academic medical centers

face similar challenges in the promotion process. The Association of American Medical College's Faculty Roster database provided us a unique opportunity to examine in detail the promotion disparities between racial/ethnic faculty at individual academic medical centers in the United States. We hypothesized that Black and Hispanic faculty would have lower rates of promotion to associate professor and full professor than would White faculty at most academic medical centers. We also sought to explore whether larger academic medical centers and academic medical centers with higher proportions of Black, Hispanic, or women faculty would approach promotion rate equity across faculty race/ethnicity.

We estimated the median institution-specific faculty promotion rates by race/ethnicity across academic medical centers and described the proportion of academic medical centers with faculty promotion rate gaps by race/ethnicity. We also investigated whether selected institutional

characteristics were associated with promotion rates for academic medical center faculty by race/ethnicity.

## METHODS

We conducted a retrospective cohort study using the Association of American Medical College Faculty Roster. The faculty roster is the most comprehensive database of sociodemographic and career trajectory data on academic medical center faculty in the United States. Every medical school has an identified faculty roster representative whose responsibilities include at least annual submission of their respective schools' data to the faculty roster. The study population included all full-time faculty at all allopathic medical schools in the United States from 1983 to 2000. We chose 1983 as the start because most missing data in the faculty roster are associated with faculty who were entered into the database before 1980. We limited analysis to faculty who entered the faculty roster as assistant professor or associate professor by 2000 because we wanted to follow faculty forward for a minimum of 8 years, during which we could identify promotion. We treated all faculty as members of 1 cohort because of the small numbers of racial/ethnic minorities at each institution, which prohibited generational cohort analysis.

There were 106 743 individuals with faculty appointment information who began as assistant or associate professor between 1983 and 2000. We excluded faculty who did not have an appointment in a basic or clinical department ( $n = 1100$ ), for whom race/ethnicity was not identified ( $n = 4515$ ), or for whom race/ethnicity was other than White, Black, or Hispanic ( $n = 12\,999$ ). Exclusion categories were not mutually exclusive. The final number of unique individuals included in our analysis was 88 432; of these, 29 847 were sequentially eligible for both promotion to associate professor and full professor over the study period, and therefore we included them in the separate analyses for both promotion types. We included 71 300 faculty members in the denominators for the proportion of faculty promoted from assistant professor to associate professor. We included 46 979 faculty members in the denominators

for promotion from associate professor to full professor.

### Independent Variables

The primary independent variable of interest was faculty race/ethnicity. The faculty roster contains self-reported designations in the following racial/ethnic categories: American Indian or Alaskan Native, Asian, Pacific Islander, Black (not of Hispanic origin), Mexican American or Chicano, Puerto Rican, multiple Hispanic, other Hispanic, White (not of Hispanic origin), and "do not wish to respond." Because of extremely small or absent numbers in several racial/ethnic categories, including faculty who identified as more than 1 race (1.4% of entire population) and the exclusion of Asians from the Association of American Medical College's traditional definition of underrepresented minorities in medicine, we included Black (non-Hispanic), White (non-Hispanic), and Hispanic (of any race) in our analysis.

We developed several additional independent variables that were institution-level measures reflecting institutional characteristics of its faculty between 1983 and 2000, including overall faculty size, overall proportion of historically underrepresented racial/ethnic minority faculty, and overall proportion of women faculty. We categorized faculty size into tertiles (large institution:  $\geq 1175$  unique faculty members; medium institution: 799–1174 unique faculty members; small institution:  $< 799$  unique faculty members). We analyzed the proportion of historically underrepresented racial/ethnic minority faculty in quartiles (first quartile:  $< 1.40\%$ ; second quartile: 1.40%–2.29%; third quartile: 2.30%–3.69%; 4th quartile:  $\geq 3.70\%$ ). We similarly analyzed the proportion of women faculty in quartiles (first quartile:  $< 26.40\%$ ; second quartile: 26.40%–30.09%; third quartile: 30.10%–33.29%; 4th quartile:  $\geq 33.30\%$ ).

### Dependent Variables

The primary dependent variable was academic faculty promotion, which we defined in 2 ways: (1) attainment of associate professor rank by assistant professor faculty in the database, and (2) attainment of full professor rank by associate professor faculty in the database, including those faculty who entered the database as associate professor. We followed each

faculty member in the study population who entered the faculty roster between 1983 and 2000 through 2008. We considered only faculty members who attained promotion without a change in institution promoted for our analyses because we were interested in institution-specific promotion rates. We considered faculty for whom there was no rank change reported to the faculty roster, who exited academic medicine entirely, and who promoted at another institution.

### Data Analysis

We analyzed data for promotion to associate professor and for promotion to full professor separately with 1 observation per individual for each promotion type. Using the individual academic medical center as the unit of analysis, we first determined promotion rates for faculty by race/ethnicity at each academic medical center. We refer to this proportion (number of promoted faculty/number of faculty at lower rank at institution) as the institution-specific promotion rate. Therefore, we calculated 6 institution-specific promotion rates for each academic medical center (i.e., 3 racial/ethnic groups multiplied by 2 promotion types). We next determined the mean and median for each of the 6 institution-specific promotion rates across the sample of 128 academic medical centers.

Because of small numbers or cells among racial/ethnic minority faculty at individual institutions, we did not include statistical comparisons of promotion rates within a single institution. We used Z-tests for proportions to examine whether the proportion of academic medical centers with lower promotion rates for Black or Hispanic compared with White faculty differed significantly from the proportion of academic medical centers without racial/ethnic differences in faculty promotion rates.

For the overall sample, we determined mean and median institution-specific promotion rates by faculty race/ethnicity using standard frequency analysis. We compared mean promotion rates for Black and Hispanic faculty with average promotion rates of White faculty using the *t* test. We compared medians similarly using the Wilcoxon rank sum test.

We next compared whether promotion rates for Black and Hispanic faculty, respectively, differed significantly from the promotion rates for White faculty within various subgroups of

academic medical centers. We defined subgroups by institutional characteristics (i.e., faculty size, proportion of underrepresented racial/ethnic minority faculty, and proportion of women faculty). We compared whether promotion rates differed within each racial/ethnic group across strata using the  $\chi^2$  test for homogeneity of proportions. If an overall difference existed, we compared whether promotion rates differed within each racial/ethnic groups across strata using the *t* test for homogeneity of proportions. In these analyses, we combined racial/ethnic faculty groups across institutions. Therefore, these promotion rates reflect aggregated data (e.g., we analyzed all Black faculty at academic medical centers with small faculty size in aggregate) instead of using mean or median institution-specific promotion rates. For all analyses, we used  $\alpha = 0.05$  as the threshold for statistical significance. We conducted analyses with SAS 9.2 (SAS Institute, Cary, NC).

## RESULTS

Our study population included 128 academic medical centers and 88 432 individual faculty members. White faculty totaled 80 713 (91.3%), Black faculty 3296 (3.7%), and Hispanic faculty 4423 (5.0%). During the study period, 19 academic medical centers (15%) had 5 or fewer Black faculty; 9 (7%) had 5 or fewer Hispanic faculty; and 4 (3%) had 5 or fewer Black or Hispanic faculty.

The quartile of academic medical centers that were most diverse by faculty race/ethnicity and faculty gender had at least 3.7% of historically underrepresented racial/ethnic minority faculty and at least 33.3% of women faculty, respectively. Many of the 128 academic medical centers had small faculty size ( $n = 70$ ), half as many had medium faculty size ( $n = 35$ ), and a few ( $n = 23$ ) had large faculty size.

### Assistant Professor to Associate Professor

Hispanic faculty experienced lower promotion rates than did White faculty from assistant professor to associate professor at 73% of the academic medical centers; promotion rates were lower for Black than for White faculty at 76% of the academic medical centers (Table 1).

**TABLE 1—US Institutions With Lower Promotion Rates for Hispanic and Black Faculty Than for White Faculty: 1983–2000**

Institutions	Promotion From Assistant Professor to Associate Professor		Promotion From Associate Professor to Full Professor	
	Academic Medical Centers, No. (%)	<i>P</i>	Academic Medical Centers, No. (%)	<i>P</i>
Promotion rates for Black faculty less than promotion rates for White faculty, %	97 (75.78)	< .001	102 (79.69)	< .001
Promotion rates for Black faculty not less than promotion rates for White faculty, %	31 (24.22)	< .001	26 (20.31)	< .001
Promotion rates for Hispanic faculty less than promotion rates for White faculty, %	94 (73.44)	< .001	78 (60.94)	.013
Promotion rates for Hispanic faculty not less than promotion rates for White faculty, %	34 (26.56)	< .001	50 (39.06)	.013

Note. Number of academic medical centers = 128.

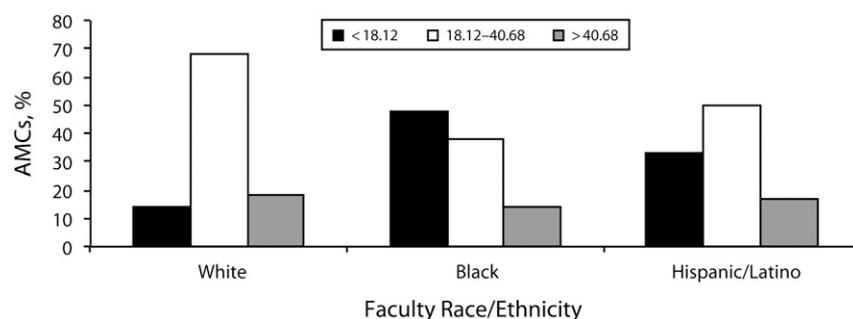
Seventeen (13%) academic medical centers did not promote any Hispanic faculty to associate professor during the study period, and 31 (24%) did not promote any Black faculty to associate professor during the study period.

Averaged across institutions, mean institution-specific promotion rates from assistant to associate professor for White, Hispanic, and Black faculty were 30% (confidence interval [CI] = 28.0%, 32.1%), 26.2% (CI = 23.3%, 29.1%), and 21.7% (CI = 18.4%, 25.0%), respectively. These mean institution-specific promotion rates for Hispanic faculty and Black faculty are significantly lower than are promotion rates for White faculty ( $P = .03$  and  $P < .01$ , respectively, according to the *t* test).

Median institution promotion rates from assistant to associate professor for White, Hispanic, and Black faculty were 30.2% (interquartile range [IQR] = 23.9%–37.0%), 23.5% (IQR = 16.3%–37.6%), and 18.8% (IQR = 9.1%–31.1%), respectively ( $P < .001$  for each comparison, with White as the reference group derived from the Wilcoxon rank sum test; Figure 1).

### Associate Professor to Full Professor

Compared with White faculty, promotion rates from associate professor to full professor were lower for Hispanic faculty at 61% of academic medical centers; promotion rates were lower for Black versus White faculty at



Note. AMC = academic medical center. Overall institution-specific median promotion rate = 29.40%; SD = 11.8%. Promotion rates grouped into 3 categories: < 1 SD below overall median, between 1 SD below and 1 SD above overall median, and > 1 SD above overall median.

**FIGURE 1—Institution-specific median promotion rates for assistant professor to associate professor at US academic medical centers by faculty race/ethnicity: 1983–2000.**

80% of academic medical centers (Table 1). Four (3%) of the academic medical centers did not promote any Hispanic faculty to the rank of full professor during the study period; 12 (9%) academic medical centers did not promote any Black faculty to full professor.

Across academic medical centers, mean institution-specific promotion rates from associate to full professor for, respectively, White, Hispanic, and Black faculty were 31.6% (CI = 30.0%, 13.4%), 27.3% (CI = 24.0%, 30.6%), and 19.8% (CI = 16.2%–23.4%). Hispanic and Black faculty had significantly lower mean promotion rates than did White faculty ( $P = .02$  and  $P < .01$ , respectively, according to the  $t$  test). Median institution-specific promotion rates for, respectively, White, Hispanic, and Black faculty were 31.5% (interquartile range 26.2%–36.9%), 25.0% (interquartile range 17.8%–36.0%), and 16.7% (interquartile range 0.0%–26.6%;  $P < .01$  with White as the reference group according to the Wilcoxon rank sum test; Figure 2).

### Institutional Characteristics

Within each stratum of academic medical center size (small, medium, and large), the promotion rates to both the associate and the full professor ranks for Black and Hispanic faculty were significantly lower than were promotion rates for White faculty ( $P < .05$ ; Table 2). The single exception was among small academic medical centers, where the promotion rates from both assistant to

associate professor and from associate to full professor for Hispanic faculty did not differ significantly from promotion rates for White faculty (from assistant to associate professor: 29% for White faculty vs 27% for Hispanic faculty;  $P = .12$ ; from associate to full professor: 31% for White faculty vs 33% for Hispanic faculty;  $P = .22$ ).

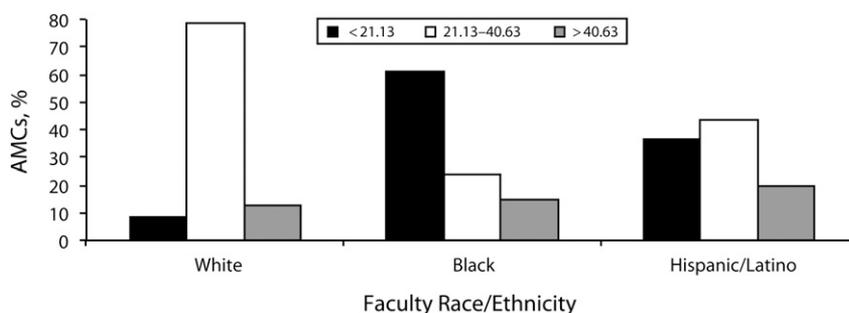
Among Black faculty, promotion rates from assistant to associate professor were higher at medium-sized institutions than at smaller or larger academic medical centers ( $P < .01$  and  $P = .013$ , respectively). The proportion of Black faculty promoted from associate to full professor did not differ significantly by institution size ( $P = .60$  for large vs medium institutions;  $P = .05$  for small vs medium institutions).

Among Hispanic faculty, promotion rates from assistant to associate professor were significantly lower at medium-sized versus large ( $P < .01$ ) and at medium-sized versus small ( $P = .02$ ) institutions. In contrast, Hispanic faculty had the highest promotion rate from associate to full professor (33%) at small academic medical centers. This proportion was significantly different from the proportion promoted at large academic medical centers ( $P < .01$ ) but was not significantly different from the proportion promoted at medium-sized academic medical centers ( $P = .07$ ).

Among academic medical centers with greater proportions of historically underrepresented racial/ethnic minority faculty, promotion rates were still significantly lower for Black and Hispanic faculty than for White faculty

( $P < .01$  when comparing Black with White faculty and Hispanic with White faculty). This pattern was apparent for academic medical centers in every quartile of the proportion of historically underrepresented racial/ethnic minority faculty (Table 2). Of descriptive note, academic medical centers with the highest proportion of historically underrepresented racial/ethnic minority faculty had the lowest promotion rates for all faculty regardless of race/ethnicity. When considering assistant to associate professor promotions, the promotion rate of Black faculty was 13.8% at the highest quartile of historically underrepresented racial/ethnic minority faculty compared with 30.1% at the lowest quartile of historically underrepresented racial/ethnic minority faculty. Similarly, Black faculty had a promotion rate to full professor of 16.2% at the highest historically underrepresented racial/ethnic minority faculty quartile academic medical centers and 21.7% at the lowest historically underrepresented racial/ethnic minorities quartile academic medical centers. Descriptively, we also observed this pattern among Hispanic faculty; promotion rates were 19.1% (to associate professor) and 27.1% (to full professor) at the highest historically underrepresented racial/ethnic minority faculty quartile academic medical centers compared with 32.0% (to associate professor) and 35.0% (to full professor) at the lowest historically underrepresented racial/ethnic minorities quartile academic medical centers.

Within each stratum of women faculty representation, the promotion rates to both the associate and the full professor ranks for Black faculty were significantly lower than were promotion rates for White faculty ( $P < .05$ ; Table 2). When considering the assistant to associate professor transition, promotion rates for Hispanic faculty were also significantly lower than the rates of their White peers except for institutions in the third quartile (30.1%–33.3% proportion of women faculty). When considering the associate professor to full professor transition, the exception was among institutions with the most women faculty, where promotion rates were not significantly different between White and Hispanic faculty (30.0% for White faculty vs 32.0% for Hispanic faculty;  $P = .32$ ).



Note. AMC = academic medical center. Overall institution-specific median promotion rate = 30.88%; SD = 9.75%. Promotion rates grouped into 3 categories: < 1 SD below overall median, between 1 SD below and 1 SD above overall median, and > 1 SD above overall median.

**FIGURE 2—Institution-specific median promotion rates for associate professor to full professor at US academic medical centers by faculty race/ethnicity: 1983–2000.**

**TABLE 2—Promotions by Faculty Race/Ethnicity and Institution Faculty Size, Proportion of Historically Underrepresented Minorities on Faculty, and Proportion of Women on Faculty: 1983–2000**

	Promotion From Assistant Professor to Associate Professor (Total Eligible n = 71 300)			Promotion From Associate Professor to Full Professor (Total Eligible n = 46 979)		
	White (n = 64 655), No./Total (%)	Black (n = 2902), No./Total (%)	Hispanic (n = 3743), No./Total (%)	White (n = 43 825), No./Total (%)	Black (n = 1161), No./Total (%)	Hispanic (n = 1993), No./Total (%)
Institution size (No. unique faculty members)						
Large institution (≥ 1175)	7744/22 723 (34.1)	175/1091* (16.0)	324/1191* (27.2)	5310/15 128 (35.1)	72/328* (22.0)	136/575* (23.7)
Medium institution (799–1175)	7262/21 815 (33.3)	153/640* (23.9)	265/1149* (23.1)	5532/15 204 (36.4)	75/316* (23.7)	166/575* (28.9)
Small Institution (< 799)	5868/20 117 (29.2)	222/1171* (19.0)	382/1403 (27.2)	4241/13 493 (31.4)	94/517* (18.2)	282/843 (33.5)
Proportion of historically underrepresented minority (historically underrepresented racial/ethnic minorities) faculty						
Fourth quartile, ≥ 3.7%	3843/14 799 (26.0)	218/1578* (13.8)	175/917* (19.1)	2767/8895 (31.1)	88/544* (16.2)	105/388 (27.1)
Third quartile, [2.3%, 3.7%)	5190/16 818 (30.9)	151/672* (22.5)	273/1051* (26.0)	3753/11 291 (33.2)	66/275* (24.0)	133/544* (24.5)
Second quartile, [1.4%, 2.3%)	6393/19 104 (33.5)	130/483* (26.9)	231/861* (26.8)	4680/13 197 (35.5)	66/245* (26.9)	131/455* (28.8)
First quartile, < 1.4%	5448/13 934 (39.1)	51/169* (30.2)	292/914* (32.0)	3883/10 442 (37.2)	21/97* (21.7)	215/606 (35.5)
Proportion of women faculty						
Fourth quartile, ≥ 33.3%	3989/15 297 (26.1)	172/1109* (15.5)	364/1625* (22.4)	2761/9249 (29.9)	68/408* (16.7)	256/812 (31.5)
Third quartile, [30.1%, 33.3%)	5917/18 017 (32.8)	154/869* (17.7)	248/790 (31.4)	4545/12 568 (36.2)	73/317* (23.0)	139/482* (28.8)
Second quartile, [28.65%, 31.85%)	6158/17 526 (35.1)	123/551* (22.3)	215/715* (30.1)	4254/12 190 (34.9)	52/240* (21.7)	101/400* (25.3)
First quartile, < 28.65%	4810/13 815 (34.8)	101/373* (27.1)	144/613* (23.5)	3523/9818 (35.9)	48/196* (24.5)	88/299* (29.4)

\*For the  $\chi^2$  test,  $P < .05$  compared with White faculty within each rank.

**DISCUSSION**

We found that, on average, institution-specific promotion rates for Hispanic and Black academic medical center faculty were significantly lower than were those of White faculty. This finding was consistent with previously published data analyzing nationally aggregated data.<sup>10,13</sup> However, we also found these disparities were not universally observed across all the medical schools in our sample. Approximately one third of the medical schools had equitable rates of promotion across racial/ethnic groups; a small subset of those schools actually had significantly higher promotion rates for Hispanic and Black academic medical center faculty compared with rates for White academic medical center faculty. Still, substantial numbers of academic medical centers did not promote any Black or Hispanic faculty over the study period, and the majority of academic medical centers had lower promotion rates for Black and Hispanic faculty than for their White peers.

Promotion equity was not achieved at large institutions in our analyses. Small institutions

did appear to achieve promotion equity for Hispanic compared with White faculty at the associate to full professor ranks. The proportion of historically underrepresented racial/ethnic minority faculty at an institution was associated with promotion rates; academic medical centers with the lowest proportion of historically underrepresented racial/ethnic minority faculty had the highest promotion rates for Hispanic and Black faculty, but promotion equity with White peers was not achieved. Similarly, academic medical centers with the lowest proportion of women faculty had the highest promotion rates for Black faculty, but the proportion of women faculty was not associated with any clear trend in promotion rates for Hispanic or White faculty; promotion equity was not achieved for either racial/ethnic minority group when we stratified the data by the proportion of women faculty. Our findings were similar when describing promotion rates from the assistant professor rank to associate professor rank or from the associate professor rank to the full professor rank.

A lack of equitable promotion opportunities for Hispanic and Black faculty will potentially have several downstream consequences, including the absence of diverse role models, mentors, and educators for trainees. Students and aspiring faculty, from all racial/ethnic backgrounds, may select institutions for training or work based on the presence or absence of diverse faculty. Furthermore, the lack of diversity on the faculty at academic medical centers can have direct implications for health-care delivery locally because academic medical centers often provide care to vulnerable patient populations. Further work needs to examine if this pattern is similar across other health professional schools.

Although we document inequity across most academic medical centers, a potential benefit of this evaluation is the identification of academic medical centers with equitable promotion rates from which we might learn best practices. The existence of a database such as the Association of American Medical College's Faculty Roster allows standardized and systematic evaluation over time; other healthcare professions

schools could similarly benefit from the development and maintenance of comparable databases. We have underscored that increasing diversity in the pipeline through recruitment efforts is key, but there is an equal need to provide support for successful and sustained academic workforce diversity.

Increasing faculty diversity is as important a goal for academic medical centers now as it has ever been. The medical profession is on the verge of an expansive increase in the number of available medical school slots, and increasing racial/ethnic diversity is a key goal of this effort.<sup>7</sup> Academic medical centers play an important role in the elimination of racial/ethnic healthcare disparities.<sup>20</sup> Academic medical centers work toward training a diverse physician workforce to provide high quality care to an increasingly diverse patient population. Also, the Liaison Committee on Medical Education recently endorsed a new diversity accreditation standard that calls on academic medical centers to demonstrate “policies and practices to achieve appropriate diversity” within their faculties.<sup>21</sup> Accreditation by the Liaison Committee on Medical Education is a prerequisite for an academic medical center’s participation in a broad range of academic activities, including eligibility for many federal grants and programs and eligibility for an academic medical center’s graduates to sit for licensure examinations and apply for state licensure. Promotion equity might be a component of a comprehensive assessment of adherence to the Liaison Committee on Medical Education’s accreditation standard.

### Limitations

We aimed to contribute to the literature by examining whether racial/ethnic disparities exist in faculty promotion rates at all academic medical centers. This knowledge importantly describes the scope of promotion equity challenges and creates the potential to identify academic medical centers that might serve as models. Still, there are some limitations to consider when interpreting our findings.

First, we could not include measures of productivity, as these are not included in the faculty roster, and we could not link our de-identified data set to other databases for analysis; however, previous work has demonstrated that adjusting for productivity in aggregated

national data does not account for observed differences in faculty promotion rates by race/ethnicity.<sup>13</sup> Our goal in this analysis was not to compare academic productivity or assess merit for promotion; rather, we sought to describe differences and similarities in institutional trends. Each academic medical center has its own institutional promotion culture and criteria, likely making any single measure of productivity inadequate at the institutional level.

Second, we could not capture all institutional characteristics of interest from this data set, such as public or private status and geographic location. We did not attempt to exclude academic medical centers in Puerto Rico or historically Black colleges or universities, and we were able to derive several institutional characteristics from our data set, including faculty size, the proportion of historically underrepresented racial/ethnic minority faculty, and the proportion of women faculty. Our exploratory analyses using these variables suggest a role for further refinement and assessment of institution-level measures.

Third, we did not specifically examine cohort effects in this analysis because recent analyses with these data have demonstrated no cohort differences in promotion rates nationally.<sup>10</sup> Finally, we assumed that the desired outcome for individual faculty members is to promote within their starting institution. We recognize that the career trajectories of faculty can vary for a myriad of professional and personal reasons. We understand that individual faculty may leave an academic medical center when recruited and promoted elsewhere. Still, our goal was not to assess the career course or professional success of individual faculty but to focus on patterns within individual institutions.

### Conclusions

For the majority of academic medical centers, our findings were, unfortunately, consistent with the body of research documenting concerns about institutional discrimination in the promotion process. Yet, we did not observe racial/ethnic inequities in promotion rates across all academic medical centers. Equitable faculty promotion rates may reflect institutional climates that also support the successful development of racial/ethnic

minority trainees, ultimately improving health care access and quality for all patients. ■

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### Contributors

M. Nunez-Smith conceptualized the study idea and design, obtained the data, drafted the article, and led all aspects of the project. M. Nunez-Smith, M. Ciarleglio, and P. Peduzzi performed the data analysis. T. Sandoval-Schaefer, J. Elumn, and L. Castillo-Page contributed to the interpretation of analyses. E. H. Bradley provided critical revisions of the article for intellectual content.

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### Human Participant Protection

The Yale University School of Medicine Human Investigations Committee granted exemption to this study because the research involved the study of existing data.

### References

1. US Census Bureau. *State & County QuickFacts*; 2009. Available at: <http://quickfacts.census.gov/qfd/states/00000.html>. Accessed October 18, 2011.
2. Sullivan LW. Missing persons: minorities in the health professions. A report of the Sullivan Commission on diversity in the healthcare workforce. *The Sullivan Report*; 2004. Available at: <http://www.paeonline.org/index.php?ht=a/GetDocumentAction/i/73958>. Accessed February 6, 2012.
3. American Medical Association. *Total Physicians by Race/Ethnicity—2008. Physician characteristics and distribution in the US, 2010*. Available at: <http://www.ama-assn.org/ama/pub/about-ama/our-people/member-groups-sections/minority-affairs-section/>

physician-statistics/total-physicians-raceethnicity. page. Accessed October 18, 2011.

4. Association of American Medical Colleges. *Table 11. Distribution of US Medical School Faculty by Sex, Race/Hispanic Origin, and Rank*. US Medical School Faculty; 2009. AAMC Faculty Roster, Washington, DC. Available at: <https://www.aamc.org/download/69260/data/09table11.pdf>. Accessed October 17, 2012.
5. Hurtado S. Linking diversity with the educational and civic missions of higher education. *Rev Higher Ed*. 2007;30(2):185–196.
6. Odom KL, Roberts LM, Johnson RL, Cooper LA. Exploring obstacles to and opportunities for professional success among ethnic minority medical students. *Acad Med*. 2007;82(2):146–153.
7. Mullan F, Chen C, Petterson S, Kolsky G, Spagnola M. The social mission of medical education: ranking the schools [Erratum appears in *Ann Intern Med*. 2010;153(3):212]. *Ann Intern Med*. 2010;152(12):804–811.
8. Nunez-Smith M, Pilgrim N, Wynia M, et al. Race/ethnicity and workplace discrimination: results of a national survey of physicians. *J Gen Intern Med*. 2009; 24(11):1198–1204.
9. Cooper LA, Powe NR. *Disparities in Patient Experiences, Healthcare Processes, and Outcomes: The Role of Patient-Provider Racial, Ethnic, and Language Concordance*. New York: The Commonwealth Fund; 2004. Publication No. 753.
10. Qi Liu C, Alexander H. Promotion rates for first-time assistant and associate professors appointed from 1967 to 1997. *AAMC Analysis in Brief*. 2010;9(7). Available at: [https://www.aamc.org/download/121130/data/aibvol9\\_no7.pdf](https://www.aamc.org/download/121130/data/aibvol9_no7.pdf). Accessed October 18, 2011.
11. Palepu A, Carr PL, Friedman RH, Amos H, Ash AS, Moskowitz MA. Minority faculty and academic rank in medicine. *JAMA*. 1998;280(9):767–771.
12. Palepu A, Carr PL, Friedman RH, Ash AS, Moskowitz MA. Specialty choices, compensation, and career satisfaction of underrepresented minority faculty in academic medicine. *Acad Med*. 2000;75(2):157–160.
13. Fang D, Moy E, Colburn L, Hurley J. Racial and ethnic disparities in faculty promotion in academic medicine. *JAMA*. 2000;284(9):1085–1092.
14. Ginther DK, Schaffer WT, Schnell J, et al. Race, ethnicity, and NIH research awards. *Science*. 2011;333(6045):1015–1019.
15. Price EG, Powe NR, Kern DE, Golden SH, Wand GS, Cooper LA. Improving the diversity climate in academic medicine: faculty perceptions as a catalyst for institutional change. *Acad Med*. 2009;84(1):95–105.
16. Mahoney MR, Wilson E, Odom KL, Flowers L, Adler SR. Minority faculty voices on diversity in academic medicine: perspectives from one school. *Acad Med*. 2008;83(8):781–786.
17. Nunez-Smith M, Curry LA, Bigby J, Berg D, Krumholz HM, Bradley EH. Impact of race on the professional lives of physicians of African descent. *Ann Intern Med*. 2007;146(1):45–51.
18. Peterson NB, Friedman RH, Ash AS, Franco S, Carr PL. Faculty self-reported experience with racial and ethnic discrimination in academic medicine. *J Gen Intern Med*. 2004;19(3):259–265.
19. Association of American Medical Colleges. *Diversity in Medical Education: Facts and Figures 2008*. Facts and Figures Data Series. 15th ed. Washington, DC; 2008. Available at: <https://www.aamc.org/publications>. Accessed October 18, 2011.
20. Betancourt JR. Eliminating racial and ethnic disparities in health care: what is the role of academic medicine? *Acad Med*. 2006;81(9):788–792.
21. Liaison Committee on Medical Education. *Functions and Structure of a Medical School. Standards for Accreditation of Medical Education Programs Leading to the M.D. Degree*; 2010. Available at: <http://www.lcme.org/functions2010jun.pdf>. Accessed October 18, 2011.