Racial and Ethnic Disparities in Faculty Promotion in Academic Medicine

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While several studies have demonstrated that female faculty are less likely than men to be promoted to senior rank, less is known about the promotion of racial/ethnic minority faculty members. In recent decades, the numbers of minority faculty have increased, and these increases have encompassed minority groups traditionally underrepresented in medicine, including blacks, Mexican Americans, Puerto Ricans, Native Americans, and Alaska Natives, as well as minority groups that have not been considered underrepresented, including Asian or Pacific Islanders (APIs) and other Hispanic Americans.

In 1980-1981, 2.6% of newly appointed assistant professors were underrepresented minorities (URMs), 10.3% were APIs, and 1.9% were other Hispanics (FIGURE); by 1996-1997, 4.6% of new assistant professors were URMs, 13.8% were APIs, and 2.1% were other Hispanics. Much smaller increases over time are noted among newly appointed associate professors (Figure). Although these increases indicate steady improvement in the representation of minority faculty, they suggest that medical schools have been more successful at recruiting minority junior faculty and less successful in helping minority junior faculty achieve senior rank.

See also pp 1111 and 1138.

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survey of medical school faculty and found that minority faculty were less likely to be promoted to senior rank than white faculty. While both faculty with and without MD degrees were included and adjustment was made for age and faculty productivity, this study was limited by a sample that included only 344 minority faculty and the self-reported nature of the survey data.

This study builds on these previous studies of racial/ethnic disparities in faculty promotion and examines promotions using data from the official roster of all US medical school faculty maintained by the Association of American Medical Colleges (AAMC), while controlling for faculty productivity using a more objective criterion, receipt of an award from the National Institutes of Health (NIH), as well as other potential confounders.

**METHODS**

**Data**

Data used in this study were obtained from the AAMC’s Faculty Roster System, the official data system for tracking US medical school faculty. This database contains updated information about faculty members including demographics, education, employment, and promotions. Based on a 1997 AAMC survey of department chairs of US medical schools, it is estimated that the database contains records for approximately 90% of all active full-time US medical school faculty (Charles A. Elliott, director of the Faculty Roster System, oral communication, March 1999).

Each medical school has a designated Faculty Roster System representative who is responsible for gathering faculty data, including information about race and ethnicity, and submitting this information to the AAMC. Typically, new medical school faculty complete the Faculty Roster form when they are first appointed, while Faculty Roster System representatives make updates to the database about changes in employment status. However, as the data are reported voluntarily by medical schools, there are variations in consistency across data elements.

**Study Population**

The study population consists of full-time US medical school faculty who became assistant or associate professors between 1980 and 1989. These years were chosen to allow all faculty to be tracked for a minimum of 8 years during which a promotion could be identified. Faculty who remain in academia may not reflect all faculty who aspire for and are eligible for promotion. Because some evidence suggests that minority faculty may be more likely to leave academia, all faculty, including those who left academic medicine during the observation period, were included in the study population. Because predominantly minority medical schools may be atypical in providing minority faculty with more mentorship and professional support than other schools, faculty from historically black medical schools and Puerto Rican medical schools were excluded (387 assistant and 253 associate professors). In addition, faculty in departments other than clinical and basic science departments, such as social science or allied health departments, were excluded (674 assistant and 360 associate professors).

Because faculty composition and the probability of promotion may change over time, the study population was di-

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**Figure. New Minority Assistant and Associate Professors as a Proportion of All New Assistant and Associate Professors**

<table>
<thead>
<tr>
<th>Year</th>
<th>Underrepresented Minorities</th>
<th>Asian/Pacific Islander</th>
<th>Other Hispanic</th>
<th>Total Minority</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980-81</td>
<td>344</td>
<td>6653</td>
<td>1135</td>
<td>2182</td>
</tr>
<tr>
<td>1984-85</td>
<td>330</td>
<td>6333</td>
<td>1130</td>
<td>2117</td>
</tr>
<tr>
<td>1988-89</td>
<td>329</td>
<td>6317</td>
<td>1136</td>
<td>2084</td>
</tr>
<tr>
<td>1992-93</td>
<td>325</td>
<td>6256</td>
<td>1145</td>
<td>2016</td>
</tr>
<tr>
<td>1996-97</td>
<td>341</td>
<td>6611</td>
<td>1135</td>
<td>2317</td>
</tr>
</tbody>
</table>

**Total No.** 6653 6333 6317 5445 3383 2182
vided into 5 cohorts representing faculty who attained their rank in 1980-1981, 1982-1983, 1984-1985, 1986-1987, and 1988-1989. The construction of these study cohorts relied on data elements in the Faculty Roster System about the year in which each faculty member attained different ranks. These variables were missing for about a quarter of medical school faculty, and they were consequently excluded from the study population. About half of these faculty with missing data were listed as faculty members prior to 1980; hence, they are not part of the later study cohorts and their exclusion is appropriate. However, some of the remaining faculty likely belonged in the 1980-1989 cohorts used for our study. To address possible bias introduced by these excluded faculty, we compared racial/ethnic disparities in promotion among these faculty and among the faculty included in our study. We found the disparities to be quite similar between the 2 groups of faculty and believe that data selection bias is not a major factor in our study.

Promotion
To define our key dependent variable, promotion, each faculty member in our study population was followed up through 1997. Faculty whose reported academic rank changed from assistant professor to associate or full professor or from associate professor to full professor during the years of observation were considered to have been promoted. Faculty for whom no rank change was reported, including faculty who left academia, were considered not to have been promoted.

Faculty Characteristics
Faculty race and ethnicity was our key independent variable of interest. Information about race and ethnicity is based on self-reported designations. The Faculty Roster System classifies faculty as American Indian or Alaska Native; API; black, not of Hispanic origin; Mexican American or Chicano; Puerto Rican; other Hispanic; white, not of Hispanic origin; or “do not wish to respond.” For this study, faculty classified as black, Mexican American, Puerto Rican, American Indian, or Alaska Native were considered URMs. These classifications do not conform exactly to official AAMC designations, which include Native Hawaiians and exclude Commonwealth Puerto Ricans from URM designation. For most analyses, URM faculty are included as a single category because the counts of faculty of specific racial/ethnic groups are small. The URM faculty were compared with white, API, and other Hispanic faculty. Faculty who did not indicate their race/ethnicity were excluded (2230 assistant and 840 associate professors).

In addition to rank, cohort, and race and ethnicity, other faculty characteristics included in the analyses were sex, type of degree, tenure status, department, medical school type, and research productivity. Degrees differentiated include faculty with MD degrees from US medical schools, MD degrees from foreign medical school, doctor of philosophy (PhD) degrees, and other degrees. Faculty with both MD and PhD degrees were classified by their medical degree. Tenure status differentiated faculty with tenure or on a tenure track from faculty on nontenure tracks. Medical school departments differentiated basic science, primary care (family medicine, internal medicine, and pediatrics), surgery, and other clinical departments. Medical school type differentiated public from private institutions.

No measure of research productivity is available from the Faculty Roster System. As a proxy for research productivity, data from the 17th Update of the Consolidated Grant Applicant File of the NIH13 were used to identify receipt of NIH awards. This file contains information on all individuals who have applied for NIH grants or contracts from fiscal year 1938 to 1998 and includes any NIH awards received. Included are awards that specifically target minority investigators, such as Research Supplements for Minority Investigators and Minority Opportunities in Research Faculty Development awards. For each faculty member, we determined whether he/she received any NIH awards during the observation period prior to promotion. Traditional research awards (ROIs) were differentiated from all other NIH awards including individual training grants.

Statistical Analysis
Data for assistant and associate professors were analyzed separately. Bivariate analyses compared the characteristics and rates of promotion of white, API, URM, and other Hispanic faculty members. While the data used in this study approach the population of all US medical school faculty, significance testing with chi-squared is reported to facilitate interpretation of findings. Multivariate analyses used logistic regression models to examine the differential likelihood of promotion of minority and white faculty. These models adjust for cohort, sex, degree, tenure status, receipt of NIH research awards, department, and medical school type. To allow comparison with results from previous studies, results are presented as adjusted odds ratios (ORs) with 99% confidence intervals. However, because promotion is not an uncommon event, ORs tend to overstate relative risk.16 Hence, adjusted ORs were used to estimate risk ratios17 and are also presented. All analyses were performed using SAS statistical software (Version 6.12, SAS Institute Inc, Cary, NC).

RESULTS
Faculty Characteristics
The study population included 28953 white, 2997 API, 1053 URMs, and 598 other Hispanic assistant professors and 14559 white, 1419 API, 280 URMs, and 286 other Hispanic associate professors. The characteristics of faculty who became assistant professors between 1980 and 1989 differed by race and ethnicity (Table 1). All minority assistant professors shared a number of differences compared with white assistant professors. API, URMs, and other Hispanic assistant professors were more likely to be graduates of foreign medical schools or affiliated with other clini-
...cal science departments. These faculty members were less likely to be tenured or on tenure tracks, were less likely to be recipients of RO1 and other NIH awards, and were more likely to have appointments in private medical schools. In addition, API and URM assistant professors were more likely to have PhD degrees or to be affiliated with basic science departments. Rates of promotion among faculty who became assistant professors between 1980 and 1989 also differed by race and ethnicity. By 1997, 46% of white assistant professors had been promoted. Twenty-nine percent of black, 29% of Mexican American, 31 Puerto Rican, and 45% of American Indian or...
Alaska Native assistant professors were promoted. Thirty-four percent of black, 24% of Mexican American, 39% of Puerto Rican, and 71% of American Indian or Alaska Native associate professors were promoted.

**Tenure and Research Awards**

Among assistant professors, those on tenure tracks were more likely to be promoted than those on nontenure tracks (TABLE 2). However, within each track, rates of promotion differed by race and ethnicity. Among assistant professors on tenure tracks, API, URM, and other Hispanic faculty were less likely to be promoted than white faculty. Similarly, among assistant professors who had served as principal investigators on NIH awards were more likely to be promoted compared with assistant professors without NIH grant funding. However, among both assistant professors who received NIH awards and those who did not receive such support, API and URM faculty were less likely to be promoted than white faculty. In contrast, other Hispanic faculty were not promoted at lower rates.

**Table 2. Promotion Rates by Tenure Status and National Institutes of Health (NIH) Awards**

<table>
<thead>
<tr>
<th>No./Total (%) Promoted by 1997</th>
<th>NIH Awards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenured or Nontenure Track</td>
<td>Received Awards</td>
</tr>
<tr>
<td>Assistant professors White*</td>
<td>7536/12,693 (59)</td>
</tr>
<tr>
<td>Asian†</td>
<td>553/1071 (52)‡</td>
</tr>
<tr>
<td>Underrepresented minorities</td>
<td>158/400 (40)‡</td>
</tr>
<tr>
<td>Other Hispanics</td>
<td>129/252 (51)¶</td>
</tr>
<tr>
<td>Associate professors White*</td>
<td>5088/8719 (58)</td>
</tr>
<tr>
<td>Asian†</td>
<td>424/755 (56)¶</td>
</tr>
<tr>
<td>Underrepresented minorities</td>
<td>67/147 (46)¶</td>
</tr>
<tr>
<td>Other Hispanics</td>
<td>83/146 (57)</td>
</tr>
</tbody>
</table>

*Indicates non-Hispanic whites.
†Indicates Asians or Pacific Islanders.
‡P < .001 in a comparison with the white faculty group.
§P < .05 in a comparison with the white faculty group.
¶Includes American Indians or Alaska Natives, blacks, Mexican Americans, and Puerto Ricans.

**Table 3. Trends in Promotion Rates by Race and Ethnicity**

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Assistant professors White*</td>
<td>3021/5666 (53)</td>
<td>2803/5279 (53)</td>
<td>2773/5581 (50)</td>
<td>2627/5970 (44)</td>
<td>2255/6457 (35)</td>
</tr>
<tr>
<td>Asian†</td>
<td>313/685 (46)‡</td>
<td>240/521 (46)§</td>
<td>213/537 (40)‡</td>
<td>199/568 (35)‡</td>
<td>173/707 (24)‡</td>
</tr>
<tr>
<td>Underrepresented minorities</td>
<td>66/176 (38)‡</td>
<td>51/160 (32)‡</td>
<td>72/202 (38)‡</td>
<td>69/241 (29)‡</td>
<td>58/281 (21)‡</td>
</tr>
<tr>
<td>Other Hispanics</td>
<td>64/125 (51)</td>
<td>54/101 (53)</td>
<td>46/106 (43)</td>
<td>44/118 (37)</td>
<td>48/148 (32)</td>
</tr>
<tr>
<td>Associate professors White*</td>
<td>1674/3056 (55)</td>
<td>1645/2878 (57)</td>
<td>1561/2879 (54)</td>
<td>1305/2811 (46)</td>
<td>1049/2935 (36)</td>
</tr>
<tr>
<td>Asian†</td>
<td>141/278 (51)</td>
<td>140/275 (51)¶</td>
<td>140/282 (50)</td>
<td>117/281 (42)</td>
<td>95/308 (31)</td>
</tr>
<tr>
<td>Underrepresented minorities</td>
<td>22/52 (42)</td>
<td>21/48 (44)</td>
<td>13/42 (31)§</td>
<td>29/48 (38)</td>
<td>16/62 (26)</td>
</tr>
<tr>
<td>Other Hispanics</td>
<td>30/58 (52)</td>
<td>29/62 (47)</td>
<td>20/50 (40)¶</td>
<td>24/52 (46)</td>
<td>19/64 (30)</td>
</tr>
</tbody>
</table>

*Indicates non-Hispanic whites.
†Indicates Asians or Pacific Islanders.
‡P < .001 in a comparison with the white faculty group.
§P < .05 in a comparison with the white faculty group.
¶Includes American Indians or Alaska Natives, blacks, Mexican Americans, and Puerto Ricans.

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Trends in Faculty Promotion

Compared with white assistant professors, minority assistant professors experienced lower rates of promotion in every cohort from 1980 to 1989 (TABLE 3). These gaps in promotion rates were largest for URM faculty, smaller for API faculty, and not statistically significant for other Hispanic faculty. These gaps appeared constant across the cohorts, and there is no evidence that these gaps had narrowed over time. Similarly, minority associate professors tended to experience lower rates of promotion than white associate professors, although this difference was not statistically significant in most cohorts. There was no evidence that these gaps in promotion rates had narrowed over time.

Multivariate Analyses

Logistic regression analyses that adjusted for cohort, faculty sex, degree, tenure status, receipt of NIH awards, department, medical school type, and tenure status were the strongest predictors of promotion among assistant professors (TABLE 4). Men, physicians, faculty not affiliated with other clinical departments, and faculty at public medical schools also were more likely to be promoted. After controlling for these covariates, API and URM assistant professors remained less likely to be promoted compared with white assistant professors.

Similar findings, although of a smaller magnitude, were observed among associate professors. Again, men, physicians, faculty with tenure, recipients of NIH awards, faculty in surgical departments, and faculty at public schools were more likely to be promoted. After controlling for these covariates, URM faculty remained less likely to be promoted compared with white associate professors, whereas differences in rates of promotion among API and other Hispanic faculty were not statistically significant.

COMMENT

The major finding of this study is that racial/ethnic minority faculty, at both...
they first attained particular ranks is un-
faculty were excluded because the year
than 16000 associate professors, some
33000 assistant professors and more
tracked the progress of more than
First, while our study used the official
contrast, our study used a retrospec-
tion. Palepu et al used a case-control
these differences can be attributed to
duration. Palepu et al11 and Palepu et al.12 However, our
study goes beyond previous work by
demonstrating an association using a
database that includes all medical
school faculty and after controlling for
cohort effects and multiple potential
confounding factors.

One difference with the study by Pa-
lepu et al12 merits comment. In our
study, estimates of the influence of race/
etnicity on promotion tend to be
smaller than comparable influence
reported by Palepu et al. For example, our
study found an OR of promotion for
URM assistant professors relative to
white assistant professors of 0.54 (risk
ratio, 0.68) whereas Palepu et al re-
ported an OR of 0.29. Similarly, our
study found an OR of promotion for
API assistant professors of 0.85 (risk
ratio, 0.91) whereas Palepu et al re-
ported an OR of 0.58. We believe that
these differences can be attributed to
differences in study design and popu-
lation. Palepu et al used a case-control
design, and consequently, the study
population included faculty whose first
faculty appointment spanned many de-
cades. A much higher proportion of the
oldest faculty were white men. Since we
have observed that promotion rates
were higher in the 1960s and 1970s, in-
adequate adjustment for cohort ef-
effects may overestimate disparities be-
tween minority and white faculty. In
contrast, our study used a retrospec-
tive cohort design that allowed focus on
cohorts of faculty who attained their

Our study has several limitations.
First, while our study used the official
roster of medical school faculty and
tracked the progress of more than
33000 assistant professors and more
than 16000 associate professors, some
faculty were excluded because the year
they first attained particular ranks is un-
known. While about half of these fac-
ulty are known to belong to cohorts
from the 1970s and earlier, some fac-
ulty undoubtedly belonged in the study
cohorts. To address possible bias due
to the exclusion of these faculty, racial/
etnic disparities in promotion among
these faculty and among the faculty in-
cluded in our study were compared and
found to be similar. In addition, to al-
low focus on the experiences of minority
faculty in the typical US medical
school, faculty of historically black and
Puerto Rican medical schools were ex-
cluded from the study population. The
promotion experiences of the 10% of
black faculty with appointments in his-
torically black medical schools and the
50% of Puerto Rican faculty with ap-
pointments in Puerto Rican schools may
differ from the experiences of minor-
ity faculty presented in this study.

Second, faculty research productiv-
ity was measured using receipt of NIH
awards. We focused on measures of
research productivity because objec-
tive and uniform measures of teaching
and administrative productivity are gen-
erally not available. We chose receipt of
NIH awards because this information is
available and because the competitive
merit review process used by the NIH
ensures that these awards uniformly rep-
resent high-quality research. We believe
that medical schools routinely use this
information in making promotion deci-
sions and found that receipt of NIH
awards is one of the strongest predic-
tors of promotion. However, other mea-
ures, particularly publication of articles
in peer-reviewed journals may reflect
research productivity more comprehen-
sively and also are used to make pro-
motion decisions. Hence, we cannot
exclude the possibility that minority fac-
tulty are less likely to be promoted be-
cause they publish less frequently.

Third, faculty tenure status cap-
tured in the database may reflect sta-
tus at initial appointment rather than
at subsequent points in time. Hence, ad-
justment for tenure status in our mod-
els may not correctly classify faculty
who transfer from tenure tracks to non-
tenure tracks. However, analyses that
focus on faculty who were never on a
tenure track demonstrate that minor-
ity faculty in this group were also less
likely to be promoted than compara-
brable white faculty. Promotion was
defined as a dichotomous variable,
and hence, faculty who were not pro-
moted represent a heterogeneous group.
This group includes faculty who sought
but were denied promotion, faculty who
did not seek promotion, faculty who left
academic medicine to pursue other
career opportunities, faculty who left
academic medicine because they per-
ceived that they would never be pro-
moted, and faculty who were termi-
nated. Analyses of associate professors,
who presumably have a significant in-
vestment in academic medicine, as well
as of assistant professors who remain
in academic medicine for at least 3 years
demonstrate lower promotion rates
among minority faculty. Hence, we do
not believe that differences in desire for
promotion or commitment to an aca-
demic career can explain these differ-
ences in promotion rates. However, ad-
ditional work is needed to examine
other reasons faculty are not pro-
moted and to differentiate lack of pro-
motion from attrition.

The findings of our study have im-
lications for faculty members, med-
cial schools, and health policymakers.
All faculty members may be discom-
forted by the low rates of promotion.
Only half of the faculty members who
became assistant or associate profes-
sors in 1980–1981 had been promoted
after 17 years of follow-up. Minority fac-
tulty members, in particular, may be
concerned by the knowledge that they
face many barriers to advancement. In
general, minority faculty are more likely
to be affiliated with departments and
medical schools with lower promo-
ration rates, and are less likely to be on
tenure tracks or to receive NIH awards,
the 2 strongest positive predictors of
promotion. API and URM faculty are
more likely to be women, for whom
lower promotion rates have been well
documented. Moreover, after these fac-
tors are taken into consideration, mi-
nority faculty are still less likely to be
promoted.
Medical schools may be equally concerned about these findings. Academic medicine has long been committed to increasing the diversity of the physician workforce. It has championed efforts to ensure a diverse applicant pool to medical school, defended equal opportunity in admissions to medical schools, and has led the opposition to activities to curb affirmative action in medical education. Hence, in the interest of equity, medical schools may perceive the need to examine the reasons racial/ethnic disparities in promotion exist in their institutions. Specifically, they may be encouraged to review promotion criteria that may place too much emphasis on basic research and undervalue contributions in education, administration, and community service often made by minority faculty.

From a practical perspective, medical schools also may be concerned that they have inadequate numbers of minority faculty to properly mentor minority students entering medical school and residency programs. Moreover, as many medical schools expand their faculty practices and compete with managed care organizations for patients, they may wonder if they have adequate numbers of minority faculty to provide culturally competent care and to meet the medical care needs of an increasingly diverse patient population in the United States.

Policymakers also may be interested in these findings. They may appreciate that efforts to train minority researchers and health professional school faculty will be jeopardized if these individuals are unable to find faculty positions with reasonable opportunities for professional growth after completion of training. Policymakers may consider expanding initiatives to support minority investigators and educators during later stages of their careers as medical school faculty.

Additional research is needed to address issues and questions raised by this study. For instance, why are minority faculty less likely to be promoted?

Are they isolated or burdened with service duties that limit their academic pursuits? Are these faculty members subjected to unconscious discrimination as suggested by some? Or are less subtle factors at play? Do culture, language, or skin color factor into the promotion process? Can faculty development programs be devised to help minority faculty overcome barriers to promotion or will medical educators continue to mirror our tiered system of health care delivery? Answers are needed to enable faculty and medical schools to better understand the reasons for racial/ethnic disparities in faculty promotion and to ensure an equitable system of professional advancement for all faculty members.

Funding/Support: This work was supported in part by The Commonwealth Fund.

Disclaimer: The views presented herein are those of the authors and not necessarily those of The Commonwealth Fund, its directors, officers, or staff.

Acknowledgment: We gratefully acknowledge Erich Studer-Ellis, PhD, and Jennifer Gold, MA, for reviewing drafts of this article and Charles Elliott for facilitating our work with the Faculty Roster System.

REFERENCES