The Entry of Underrepresented Minority Students Into US Medical Schools: An Evaluation of Recent Trends

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ABSTRACT

Objectives. Recent challenges to affirmative action suggest the need to reassess the status of the admission of underrepresented minority students to US medical schools.

Methods. The Association of American Medical Colleges provided US medical school enrollment data and characteristics. Five measures of underrepresented minority enrollment and an overall performance scale were constructed for each school. Multivariate regression identified significant overall performance predictors. Predicted and observed values were compared.

Results. Underrepresented minority enrollment increased by 43% after 1986, peaked at 2014 in 1994, did not increase in 1995, and decreased by 5% in 1996. Enrollment was associated with increasing federal research funding and with percentage of underrepresented minorities in the source population ($P < .001$). The 1996 decline was almost entirely limited to public medical schools. Those in California, Texas, Mississippi, and Louisiana accounted for 18% of 1995 enrollment but 44% of the 1996 decline.

Conclusions. Recent gains in medical school enrollment of underrepresented minorities are being reversed, particularly at public institutions. Implications exist for the health of poor, minority, and underserved communities, which are more likely to be cared for by underrepresented minority physicians. (*Am J Public Health.* 1998;88:1314–1318)

Recent events suggest the need to reassess the current enrollment status of underrepresented minority students—defined by the Association of American Medical Colleges (AAMC) as African Americans, Mexican Americans/Chicanos, mainland Puerto Ricans, and American Indians/Native Alaskans—in US medical schools. The first event was the 1995 decision by the regents of the University of California to ban race- and gender-based preferences in admissions.[1] The second was the 1996 US Supreme Court action upholding the Fifth District Court of Appeals finding in *Hopwood* (a law school applicant) *v Texas* that eliminated such preferences among public higher educational institutions in Texas, Louisiana, and Mississippi.[2] The most recent was the passage of the California Civil Rights Initiative in the November 1996 general election, which eliminated race-, ethnicity-, and gender-based preferences from all governmental functions in the state of California.

A large body of literature has described several phases in the history of the participation of underrepresented minority groups in the medical profession.[3–5] Prior to 1968, only about 2.5% of American physicians were African American—virtually all trained at Howard or Meharry medical schools—and less than 0.2% of medical students were Mexican American, Puerto Rican, or American Indian/Native Alaskan.[6–9] After the AAMC called upon US medical schools to achieve a national student body reflecting the diversity of the general population (12% underrepresented minority groups),[10] the number of minority medical students in US medical schools increased, reaching 10% of enrollment in 1974.[11] In the mid-1970s the rate at which underrepresented minorities entered medical school diminished substantially in the wake of reverse discrimination lawsuits filed by Marco DeFunis and Allan Bakke and reductions in federal and private foundation support of medical education.[9,10,12,13] This led the AAMC to initiate the "Project 3000 by 2000" campaign in 1990, resulting in further increases in the total number of underrepresented minority students entering US medical schools.[5]

Yet little analysis has been performed of variation in and factors associated with the distribution of underrepresented minority students across US medical schools. This information is vital to an assessment of how enrollment patterns may be affected by a retreat from afffirmative action efforts. Thus, in writing this article we sought to examine (1) aggregate data on the number of underrepresented minority students entering US medical schools through 1996, (2) institution-specific measures of medical school performance in the matriculation of minority medical students, and (3) the association of various medical school characteristics with such matriculation.

Methods

Data through 1996 on the number of first-year students at each US medical school and other medical school characteristics were provided by the AAMC and its publications.[14–16] The 1990 US census provided population information. Data from historically African-American Howard, Meharry, and Morehouse medical schools were included in the reported aggregate totals but

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were not used further for institution-level analysis. Three additional institutions (Brown, Minnesota–Duluth, and Uniformed Services) were also excluded from institution-level analysis owing to incomplete data on institutional or student body characteristics. Standard AAMC definitions of underrepresented minority students were used.

Five measures of individual medical school performance in enrolling first-year underrepresented minority students were generated: (1) their simple percentage among all first-year students in 1996, (2) their mean percentage between 1986 and 1996, (3) their mean absolute number from 1986 to 1996, (4) their 1986 to 1996 interval change in absolute percentage, and (5) the difference between their mean percentage and the percentage of the combined racial/ethnic groups in the local and national reference population from which the medical school draws students. Principal components analysis, a statistical method used to derive a small number of linear combinations of a set of variables that retain as much of the information in the original variables as possible, was applied to perform a dimension reduction of the above 5 performance measures. A sixth measure, an overall cumulative performance score for each institution, was then generated from the model by weighting (proportional to the variance of the principal components) the first 2 principal components.[17]

Multivariate linear regression analysis was performed to model variation in cumulative performance scores across individual medical schools as a function of 10 institutional characteristics: (1) public or private ownership status; (2) the proportion of graduates in primary care specialties; (3) the proportion of graduates serving as medical school faculty; (4) tuition (state resident tuition for public institutions); (5) the proportion of students planning to practice in the medical school's state of location; (6) the proportion of students whose permanent residence was outside that state; (7) the total amount of federal research dollars received by the school; (8) the ratio of total first-year students to total applicants; (9) the proportion of underrepresented minorities in the each school's reference population; and (10) a measure of the difference between this proportion and the proportion of underrepresented minorities in the county or metropolitan area in which the school is located (adjusting for the fact that some institutions, such as Albany, are located in low-minority regions of high-minority states).

Several notable factors were not incorporated into this model. These include the presence of minority affairs officers (virtually all medical schools have had such positions), participation in Project 3000 by 2000 (virtually all medical schools participate), and the percentage of faculty from underrepresented minority groups (limited by definitional problems and very small reported numbers). Predicted values derived from this model were then calculated for each institution and compared with the institution's observed cumulative performance score.

Results

Between 1990 and 1994, the number of new underrepresented minority students entering medical school grew at an 8.3% average annual rate, culminating with the enrollment of 2014 minority students (12.4% of all new entrants) in 1994. In 1995, this growth halted when 2010 such students entered medical school. In 1996, only 1906 underrepresented minority students entered first-year medical school classes—5.2% fewer than in 1995 and 38% fewer than the 3078 who would have been enrolled if the distribution of underrepresented minority medical students were equal to the distribution of these minority groups in the overall US population. Fifty-four percent of all medical schools (61% of public institutions and 44% of private institutions) experienced such declines.

In 1995, 66.2% of underrepresented minority first-year medical students (vs 60.5% of nonminority students, $P<.001$) attending majority medical schools (i.e., excluding Howard, Meharry, and Morehouse) were enrolled in public institutions. Prior to 1996, a greater proportion of first-year classes at these public institutions consisted of underrepresented minorities (11.5% vs 8.9%, $P<.01$). Yet virtually all of the 1996 decline in minority student matriculation occurred in public medical schools, resulting in a collective 9.1% decrease in enrollment at such institutions (compared with a decrease of 1.8% in private medical schools) as the proportion of minority first-year students attending public medical schools fell to 58.6%. Public medical schools in California, as well as Louisiana, Mississippi, and Texas, were disproportionately affected by this trend. While these schools enrolled approximately 18% of underrepresented minority medical students in 1995, they accounted for 44% of the decrease in such enrollment in 1996.

African Americans (the largest underrepresented minority group, with almost two thirds of the total number of first-year medical students) experienced a 6.7% drop in enrollment in 1996. The number of Hispanic first-year students declined by 2.6% in 1996 as a 33% increase among mainland Puerto Ricans was offset by an 8% decline among Mexican American/Chicano students (whose medical school enrollment is concentrated in Texas and California). The number of entering American Indian/Alaskan Native students (7% of total underrepresented minority students) fell by 2% in 1996. Enrollment declined by 1.9% and 8.9% for underrepresented minority women and men, respectively.

Five institutions—the University of Texas campuses at Galveston and Houston, Michigan State University, Robert Wood Johnson Medical School (of the University of Medicine and Dentistry of New Jersey), and the University of California, Los Angeles—were ranked among the top 10 institutions in 4 of 6 measures of the performance of individual medical schools in admitting first-year students from underrepresented groups (Table 1). Conversely, 5 medical schools—the University of Missouri–Kansas City, Mercer University, the University of Hawaii John A. Burns School of Medicine, Marshall University, and the University of Vermont—were ranked among the bottom 10 in at least 4 categories. Of note, among majority institutions, only the 10 shown in Table 1 enrolled minority medical students in proportions equal to or exceeding their proportions in the schools' reference populations.

Only 2 independent variables (increasing federal research dollars and a greater percentage of minority residents in the medical schools' reference populations) were significantly associated with a greater cumulative performance score in minority medical student enrollment (Table 2). This model was then used to predict cumulative performance. Michigan State had the greatest positive deviation from its predicted cumulative performance score and the University of California, Irvine, the greatest negative deviation (Table 3).

Discussion

The role of affirmative action in increasing the number of physicians from populations historically underrepresented in the medical profession has been clearly articulated.[18] Notwithstanding the current debate and controversy surrounding afffirmative action, we chose to focus our analysis on one of its products: increased numbers of medical students from populations currently underrepresented in the medical profession. Previous research has demonstrated that such populations often reside in medically underserved communities and that they experience poorer health outcomes, owing in no small part to diminished medical care access.[19,20]

TABLE 1—US Medical Schools With the Highest and Lowest Values for Performance in Underrepresented Minority Enrollment

Percentage of underrepresented minorities among first-year students, 1996

Rank	Name	%	Rank	Name	%
1.	UT Galveston	30.0	116.	Vermont	0.0
2.	Arizona	29.7	115.	Missouri–Kansas City	1.0
3.	New Mexico	29.1	114.	Southern Illinois	1.4
4.	UCLA	28.1	113.	Albany	1.5
5.	Robert Wood Johnson	26.7	112.	Hawaii	1.8
6.	Cornell	26.2	111.	Marshall	1.8
7.	UT Houston	25.9	110.	UC Davis	3.0
8.	Maryland	24.0	109.	Loyola Stritch	3.1
9.	Michigan State	23.6	108.	New York Medical	3.1
10.	East Carolina	22.0	107.	Minnesota–Minneapolis	3.1

Weighted[a] mean percentage of underrepresented minorities among first-year students, 1986–1996

Rank	Name	%	Rank	Name	%
1.	UCLA	26.4	116.	South Dakota	1.9
2.	UT Galveston	25.9	115.	Marshall	2.2
3.	UC San Francisco	22.1	114.	Vermont	2.4
4.	New Mexico	21.8	113	St. Louis	2.6
5.	Illinois	21.4	112.	West Virginia	2.7
6.	Robert Wood Johnson	21.1	111.	Hawaii	3.1
7.	Michigan State	20.9	110.	Missouri–Kansas City	3.7
8.	East Carolina	19.4	109.	New York University	4.1
9.	Southern California	19.4	108.	Northeast Ohio	4.2
10.	UT San Antonio	18.7	107.	Mercer	4.2

Weighted[a] mean absolute number of underrepresented minorities among first-year students, 1986–1996

Rank	Name	No.	Rank	Name	No.
1.	Illinois	72.4	116.	South Dakota	1.0
2.	UT Galveston	55.9	115.	Marshall	1.2
3.	UCLA	46.1	114.	Hawaii	1.8
4.	Wayne State	46.1	113.	Mercer	2.1
5.	MCP–HU	44.6	112.	Vermont	2.3
6.	UT Houston	40.6	111.	West Virginia	2.5
7.	UT San Antonio	39.8	110.	Nevada	2.6
8.	UC San Francisco	33.7	109.	Missouri–Kansas City	3.5
9.	Robert Wood Johnson	32.5	108.	St. Louis	4.1
10.	Temple	31.4	107.	SC	4.5

(Continued)

Physicians from underrepresented populations are more likely to practice in underserved regions, to have patients from their own racial or ethnic groups, and to serve Medicaid recipients and the uninsured.[21–25] It is clear that underrepresented minority physicians make important public health contributions to the communities they serve. Therefore, one of the most compelling reasons to continue efforts to increase underrepresented minority medical student enrollment is to address changing population demographics: the proportion of such groups in the US population will approach 30% during the careers of medical students graduating in the year 2000.

Yet the trend of increasing enrollment of medical students from underrepresented ethnic and racial minority populations halted in 1994. If it had continued, US medical schools would probably have surpassed the AAMC goal of 3000 underrepresented minority medical students shortly after the year 2000 target. There is a grave danger that the 1994 and 1995 enrollment levels will not be matched in the near future, given the significant downturn seen with the 1995 and 1996 entering classes. The potential significance of the decline in enrollment of underrepresented minority students at public medical schools is especially profound.

If the decline seen among California, Louisiana, Mississippi, and Texas public medical schools had occurred among all US public medical schools, only 1635 underrepresented minority students would have entered medical school in 1996, a level of matriculation not seen since the mid-1980s.

This reversal of enrollment gains is probably due to a combination of factors, including litigation, administrative and legislative actions, and ballot initiatives that may modify or specifically eliminate race- and ethnicity-based admissions preferences. These events are associated with a 7% decrease in the acceptance rate of underrepresented minority students from 1994 to 1996 (while the acceptance rate for non-underrepresented applicants was unchanged) that more than offset a 2.2% increase in the number of underrepresented minority applicants during this period.[16] However, it would be incorrect to attribute all of this change to such events. The downward trend noted in California's public medical schools began with a 5% drop in underrepresented minority medical student matriculation in 1993 (culminating in a 33% reduction by 1996), well before the University of California regents' order eliminating race- and ethnicity-based preferences—suggesting that other, less tangible, factors are also at work. On the other hand, it is implausible to expect that these events will do anything other than accelerate the current trend.[26] It is also incorrect to assume that the 1996 downturn represents a one-time event, given the disproportionate decline in enrollment in regions where race- and ethnicity-based affirmative action programs have been curtailed and the momentum for similar efforts throughout the country.

The historic reliance on public medical schools for the preponderance of underrepresented minority student enrollment also appears to have contributed to the decline in their enrollment. Heightened sensitivity on the part of public medical schools to public and political priorities appears to have resulted in an Achilles' heel that initially spurred public medical schools to address the needs of their populations by enrolling minority students, yet left these same institutions particularly vulnerable to anti–affirmative action pressure. In this context, it is notable that all historically significant anti–affirmative action litigation has been filed against public institutions (*DeFunis* against the University of Washington, *Bakke* against the University of California, and *Hopwood* against the University of Texas). Furthermore, nonjudicial efforts to curtail afffirmative action (the 1995 University of California regents' decision and the 1996 California Civil Rights Initiative) have also been directed toward public institutions.

However, reliance on private medical schools to maintain the enrollment of underrepresented minority students is not likely to succeed, as only approximately one third of minority medical students attending majority institutions are enrolled at private schools. Therefore, every incremental loss in public medical school enrollment would have to be offset by an almost 2-fold increase in private medical school enrollment.

No previous analysis of patterns in the enrollment of underrepresented minorities has focused on associated institutional characteristics. Apart from the proportion of minorities in the reference population from

TABLE 1—*Continued*

Absolute change in the percentage of underrepresented minorities among first-year students, 1986–1936

Rank	Name	Percentage-Point Change	Rank	Name	Percentage-Point Change
1.	Arizona	21.2	116.	UC Irvine	−16.0
2.	Baylor	17.9	115.	SUNY Buffalo	−14.3
3.	Southern California	17.7	114.	UC Davis	−12.2
4.	UT Houston	17.5	113.	Southern Illinois	−12.2
5.	Robert Wood Johnson	17.5	112.	New York Medical	−11.8
6.	Medical University of SC	15.9	111.	UC San Diego	−11.0
7.	Mayo	14.7	110.	UC San Francisco	−6.5
8.	Louisiana–New Orleans	14.6	109.	Michigan	−6.4
9.	Duke	13.5	108.	Pittsburgh	−6.2
10.	Chicago Medical	13.0	107.	Nebraska	−6.2

Absolute difference between percentage of underrepresented minorities among first-year students and percentage of such minorities in the school's reference population,[b] 1986–1996

Rank	Name	Percentage-Point Difference	Rank	Name	Percentage-Point Difference
1.	Iowa	6.3	116.	Texas Tech	−28.2
2.	North Dakota	5.9	115.	Louisiana–Shreveport	−27.0
3.	Minnesota–Duluth	5.0	114.	Mercer	−24.8
4.	Wright State	4.8	113.	Texas A&M	−24.6
5.	Michigan State	3.9	112.	Mississippi	−24.3
6.	Wisconsin	3.1	111.	New Mexico	−24.2
7.	Temple	2.6	110.	SC–Columbia	−23.1
8.	Medical College of Ohio	1.2	109.	UT—Southwestern	−22.6
9.	Case Western	0.9	108.	UC Irvine	−21.5
10.	MCP–HU	0.4	107.	Georgia	−21.5

Unadjusted cumulative performance, 1986–1996

Rank	Name	Rank	Name
1.	UT Galveston	116.	Mercer
2.	UCLA	115.	Vermont
3.	Robert Wood Johnson	114.	Missouri–Kansas City
4.	UT Houston	113.	Albany
5.	Illinois	112.	Marshall
6.	Arizona	111.	Hawaii
7.	New Mexico	110.	South Dakota
8.	Michigan State	109.	Southern Illinois
9.	Southern California	108.	St. Louis
10.	MCP–HU	107.	Jefferson

Note. UT = University of Texas; UCLA = University of California, Los Angeles; UC = University of California; MCP–HU = Medical College of Pennsylvania and Hahnemann University; SC = South Carolina; SUNY = State University of New York. Data and rankings for all US medical schools may be obtained directly from the authors.

[a]Weights are 11 for 1996, 10 for 1995, through 1 for 1986.

[b]For each school, the reference population was the sum of (1) the underrepresented minority proportion of the school's state population multiplied by the proportion of the 1995 entering class from within the state and (2) the proportion of underrepresented minorities in the US population (19.1%, 1990 census) multiplied by the proportion of the 1995 entering class from outside the state.

which a medical school draws students, which was not unexpected, greater minority enrollment was significantly associated only with receipt of increasing amounts of federal research dollars. The reason for this finding is not clear. Greater federal research funding is often considered to be a desirable medical school characteristic and may provide institutions with more discretionary support for various activities that may encourage the enrollment of underrepresented minority students. It is also noteworthy that certain other variables did not achieve significance as predictors of minority medical student enrollment. These include tuition, the ratio of applicants to entrants, degree of primary care orientation, and the proportion of graduates serving as medical school faculty.

Some institutions have been particularly successful in enrolling students from underrepresented minority groups, while others have recently and dramatically increased their number of entering minority students. However, recent patterns of underrepresented minority enrollment at other institutions are disappointing. These include 3 of the 5 University of California campuses (Davis, Irvine, and San Diego), where substantial declines in enrollment have recently occurred. Institutions such as the University of Vermont and the University of Hawaii are also identified as relative underperformers, but their ability to improve may be constrained by the paucity of defined minority populations in their respective states. Hawaii, for instance, enrolls a large number of Native Hawaiians, who were not included among underrepresented minorities until 1997. In interpreting such institutional performance, though, it is important to appreciate the fact that medical schools are not entirely responsible for such matriculation patterns; the selection of an institution by students is also important.

The vast majority of US medical schools have consistently failed to enroll students from underrepresented minorities at rates commensurate with their proportion in the general population. Since the late 1960s, great strides have been made in rectifying this situation. It is profoundly disturbing that at the time when the greatest numbers of underrepresented minority students are attending US medical schools, their matriculation is being successfully challenged by actions designed to effectively eliminate the very affffirmative action programs that contributed to this accomplishment. A recent analysis has indicated that the United States needs roughly twice as many African American and Hispanic physicians and 3 times as many Native American physicians as it has now to serve its future population needs.[27] It is therefore a tragedy that some potential minority physicians may look upon the current downturn in matriculation of underrepresented minority medical students as an indication that they are not welcome at certain medical schools, or even within the medical profession. It is more important than ever that US medical schools rise to the challenge of training more students from underrepresented minority populations—not only to guarantee them a place in the medical profession, but also to improve the public health of underserved, minority, and, indeed, all communities. □

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TABLE 2—Multivariate Predictors of the Cumulative Performance of US Medical Schools in Matriculation of Underrepresented Minority First-Year Medical Students

Independent Variable	β
Public ownership	.024
% Primary care graduates	−.117
% Planning to stay in state	−.015
% Out-of-state students[a]	−.062
% Faculty graduates	−.113
Federal research dollars[b]	.377**
Tuition	−.178
Applicant:enrollee ratio	−.050
% Minorities in reference population[c]	.291*
Regional minority population[d]	.134
Model R^2 = .267	

*P < .01; **P < .001.
[a]The proportion of out-of-state applicants was used for the University of Southern California, as this institution does not report residence data for its student body.
[b]The natural log transformation was used to normalize the distribution of this variable.
[c]Based on the proportion of in-state and out-of-state applicants.
[d]Based on the standard metropolitan statistical area or county of school location.

TABLE 3—Adjusted Cumulative Performance Rankings of US Medical Schools With Regard to Matriculation of Underrepresented Minority First-Year Students

High			Low		
Rank	Name	P[a]	Rank	Name	P[a]
1.	Michigan State	.001	116.	UC Irvine	.015
2.	Robert Wood Johnson	.006	115.	Louisiana–Shreveport	.017
3.	MCP–HU	.006	114.	Vermont	.030
4.	UT Galveston	.006	113.	Georgia	.033
5.	Illinois	.009	112.	UT–Southwestern	.034
6.	North Dakota	.018	111.	SUNY Buffalo	.048
7.	Wright State	.022			
8.	UCLA	.026			
9.	UT Houston	.032			
10.	East Carolina	.034			
11.	Arizona	.034			
12.	Case Western	.039			
13.	Southern California	.041			
14.	Temple	.046			
15.	Cornell	.049			
16.	Mayo	.050			

Note. Rankings are based on deviations of each school's cumulative performance from its predicted performance. Schools with higher rankings have greater than predicted cumulative performance, while those with lower rankings have lower than predicted cumulative performance. MCP–HU = Medical College of Pennsylvania and Hahnemann University; UT = University of Texas; UCLA = University of California, Los Angeles; UC = University of California; SUNY = State University of New York.
[a]P values are 2-tailed and were calculated on the basis of the deviation from the mean of the distribution.

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