

## SPECIAL REPORT

## Diversity of the National Medical Student Body — Four Decades of Inequities

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## SUMMARY

A racially and ethnically diverse health care workforce remains a distant goal, the attainment of which is contingent on the inclusivity of the national medical student body. We examined the diversity of medical school applicants and enrollees over the past four decades with an eye toward assessing the progress made. Data on the gender and race or ethnic group of enrollees in all medical doctorate degree-granting U.S. medical schools from 1978 through 2019 were examined. The percentage of female enrollees doubled during this period, and women now constitute more than half the national medical student body. This upturn has been attributed largely to an increase by a factor of 12 in the enrollment of Asian women. The corresponding decrease in the percentage of male enrollees, most notably White men, was offset by an increase by a factor of approximately 5 in the enrollment of Asian men. The percentages of enrollees from Black, Hispanic, and other racial and ethnic groups that are underrepresented in medicine remain well below the percentages of these groups in the national Census.

A preponderance of scientific evidence supports the view that a diverse health care workforce constitutes a compelling national interest.<sup>1-7</sup> In affirmation of this tenet, the National Academy of Medicine concluded that “increasing racial and ethnic diversity among health professionals . . . is associated with improved access to care for racial and ethnic minority patients.”<sup>4</sup> However, a diverse and all-inclusive health care workforce remains aspirational. Less than 12% of U.S. physicians identify as either Hispanic or Black, although according to the U.S. Census, the percentages of these groups in the U.S. population are 18.3% and 13.4%, respectively.<sup>8,9</sup> Other racial

and ethnic groups that are underrepresented in medicine include American Indians and Alaska Natives as well as Native Hawaiians and other Pacific Islanders.<sup>8</sup> It follows that achieving the goal of a truly representative health care workforce will require a greater degree of inclusivity in the national medical student body. It is against this backdrop that we examined the diversity of the national medical student body with respect to gender, race, and ethnic group over the past four decades.

## METHODS

The data sets for this study were provided by the Association of American Medical Colleges (AAMC). One data set that includes the annual number of enrollees in each of the U.S. medical doctorate degree-granting medical schools from 1978 through 2019, as well as the gender and race or ethnic group of these students, is available at [https://figshare.com/articles/dataset/Supplemental\\_Table\\_original\\_data\\_xlsx/12842996](https://figshare.com/articles/dataset/Supplemental_Table_original_data_xlsx/12842996). Enrollees who were not U.S. citizens or permanent U.S. residents were not included in our data because their gender, race, and ethnic group status was not recorded by the AAMC.

A second data set (Table S1 in the Supplementary Appendix, available with the full text of this article at NEJM.org) includes the annual number of enrollees at each of the U.S. medical schools who identified with one or more racial or ethnic groups during the 1978–2019 study period. A third data set (Table S2) includes the annual number of student applicants and matriculants (first-year entrants) at each of the U.S. medical schools during the same period, as well as their gender and race or ethnic group.

The six categories of race or ethnic group in this study conform to conventions established by the U.S. Census Bureau. These categories are

White; Asian; Black or African American (hereafter, Black); Hispanic, Latino, or of Spanish origin (hereafter, Hispanic); American Indian or Alaska Native; and Native Hawaiian or other Pacific Islander.<sup>9</sup> The latter four groups are underrepresented in medicine.<sup>8</sup>

For the data sets used in the study, the categories of race or ethnic group with which enrollees identified were established by the AAMC.<sup>10</sup> Two changes in the manner in which the AAMC collected data occurred during the study period. Before the academic year 2002–2003, individual enrollees could identify with only one race or ethnic group. From the academic year 2002–2003 until the academic year 2012–2013, the AAMC collected these data from questionnaires that included two questions — one that asked students to designate one or more races and a second that asked about Hispanic origin. Since the academic year 2013–2014, the AAMC has collected data on race or ethnic group from questionnaires that include a single question. In answering this question, students can designate multiple races or ethnic groups. The Supplementary Appendix includes the relevant questionnaire content used by the AAMC during these three time periods.

The changes in the data-collection methods affected the data for the years that preceded the changes because the AAMC retroactively modified a person's profile if new information was

submitted after the original data collection. Some of our analyses include data only for persons who designated one specific race or ethnic group, and students who designated multiple categories were counted as having “multiple races” or were omitted from the analyses. In other analyses, students were included in the percentage for a category of race or ethnic group if it was the single category selected or one of multiple categories selected.

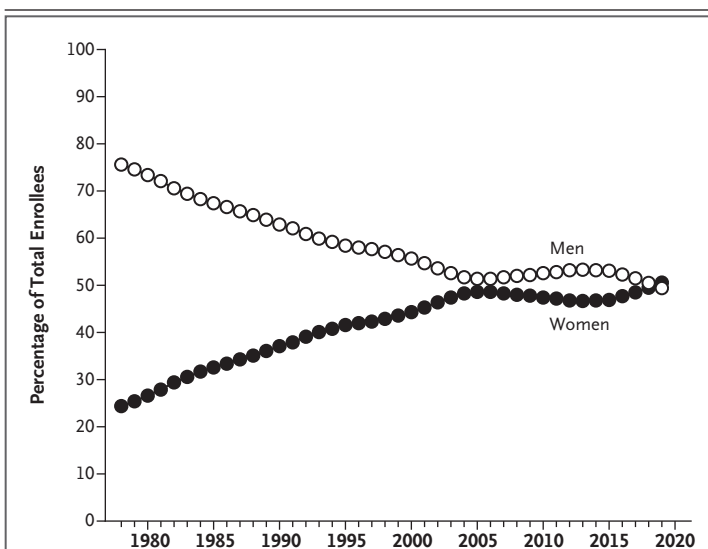
The percentages of enrollees in each category of gender and race or ethnic group were compared over time. Similar analyses were conducted on the basis of medical school characteristics (e.g., geographic region and private or public status). The geographic regions used in comparisons of the diversity of medical schools were based on the regional definitions of the Census Bureau.<sup>11</sup> In addition, to assess the effect of historically Black medical schools on the racial and ethnic diversity of the national medical student body, we performed a further analysis using data with or without enrollees from Howard University College of Medicine, Meharry Medical College, Morehouse School of Medicine, and the Charles R. Drew–UCLA Medical Education Program.<sup>12</sup>

To evaluate additional changes over time in the diversity of the national medical student body, we compared the percentages of men and women enrollees who identified with the racial and ethnic groups with the percentages of men and women in these groups in data from the Census in 1980, 2000, and 2019.<sup>9,13,14</sup> Given the principle that the diversity of the populations of physicians should reflect that of the populations they serve, we used aggregate Census data that included persons of all ages in each category of race or ethnic group. The use of the 1978 population estimate of the Census Bureau (the starting point of the study period) was precluded by the absence of data on Hispanic origin. Matriculation rates were calculated by dividing the number of matriculants in a specific category of race or ethnic group by the number of applicants in that same category.

## RESULTS

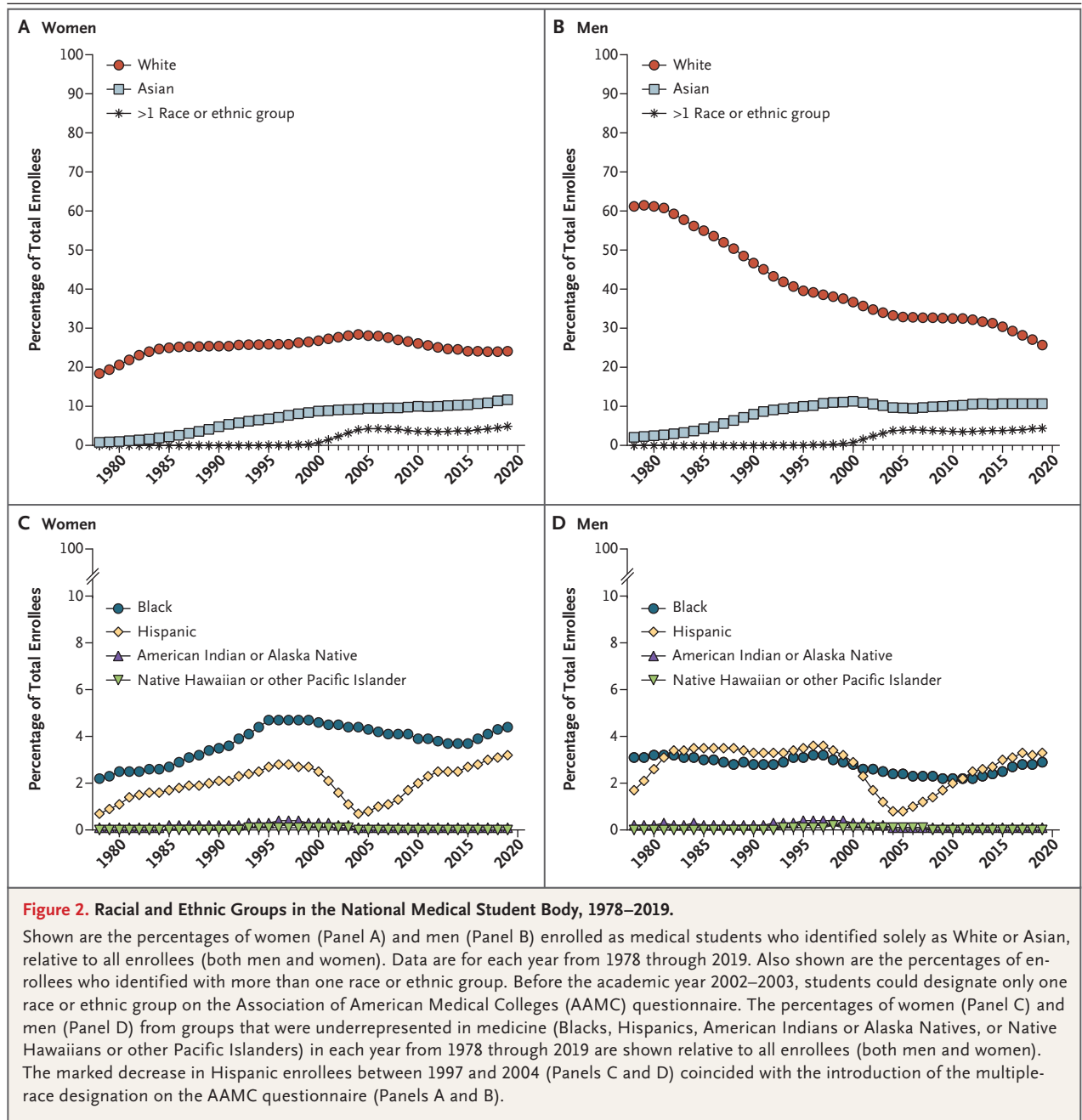
### CHANGES IN THE DIVERSITY OF THE MEDICAL STUDENT BODY OVER TIME

Assessment of the gender distribution of the national medical student body over the study period revealed that the percentage of women



**Figure 1.** Gender Distribution in the National Medical Student Body, 1978–2019.

The percentages of total enrollees accounted for by women and by men are shown for each year from 1978 through 2019.



enrolees increased substantially from 24.4% in 1978 to 50.6% in 2019 (Fig. 1). Most of the increase (from 24.4% to 48.6%) transpired from 1978 to 2005.

Over the same period, the percentage of White women in the national medical student body increased from 18.4% to 24.1% relative to the total national student body (including both men and women), and the percentage of Asian women in the national student body increased by

a factor of 12 (Fig. 2A). A modest increase was also noted in the percentage of Black women (from 3.6% to 4.4%) (Fig. 2C). A more marked increase in the percentage of Hispanic women (from 0.7% to 3.2%) occurred despite an apparent intervening decrease that coincided with the introduction of the option to select multiple categories of race or ethnic group on the AAMC questionnaire (Fig. 2C).

The aforementioned increase in the percent-

age of women over the study period coincided with a marked decrease in the percentage of White men, from 61.2% to 25.7% (Fig. 2B). In contrast, the percentage of Asian men increased from 2.1% to 10.7% (Fig. 2B). There was a small decrease (from 3.1% to 2.9%) in the percentage of Black men (Fig. 2D). There was an increase in the percentage of Hispanic men from 1978 through 1982, but only a minimal net change from 1982 through 2019 (Fig. 2D). Men and women who identified as American Indian or Alaska Native or as Native Hawaiian or other Pacific Islander composed less than 1% of the total enrollee population throughout the study period (Fig. 2C and 2D).

At the outset of the study period (Fig. S1A), 18.2% of Black women and 21.6% of Black men in the national student body were enrolled in historically Black medical schools, and by the end of the study period, 14.2% and 14.9%, respectively, were enrolled in these schools. Examination of the percentage of Black enrollees in historically Black medical schools relative to all Black enrollees in medical schools (Fig. S1B) revealed consistent contributions of historically Black medical schools to the national medical student body throughout the study period.

The institution of the option for enrollees to indicate on the AAMC questionnaire that they identified with one or more categories of race or ethnic group coincided with an inflection in several of the curves showing the percentages of enrollees who identified with a race or ethnic group over the study period (Fig. 2). Although the percentages of White enrollees and Asian enrollees were minimally affected by this questionnaire change (Fig. S2), there was a marked, if temporary, decrease in the percentage of Hispanic enrollees (Fig. 3C and 3D). This decrease was associated with enrollees who identified solely as Hispanic and coincided with a steady increase in the proportion of enrollees who identified as Hispanic as well as with another race or ethnic group, most notably White race (Fig. 3). Similarly, in 2019, the proportion of enrollees who identified as American Indian or Alaska Native or as Native Hawaiian or other Pacific Islander as well as with another race or ethnic group was several times higher than the proportion of those who identified with just one race or ethnic group (Fig. 3). In contrast, few men and women enrollees who identified as Black

**Figure 3 (facing page). Medical Students Who Identified with at Least One Race or Ethnic Group That Is Underrepresented in Medicine.**

Shown are the percentages of enrollees from racial and ethnic groups that are underrepresented in medicine relative to all enrollees (both men and women) for each year from 1978 through 2019.

also identified with at least one other race or ethnic group (Fig. 3).

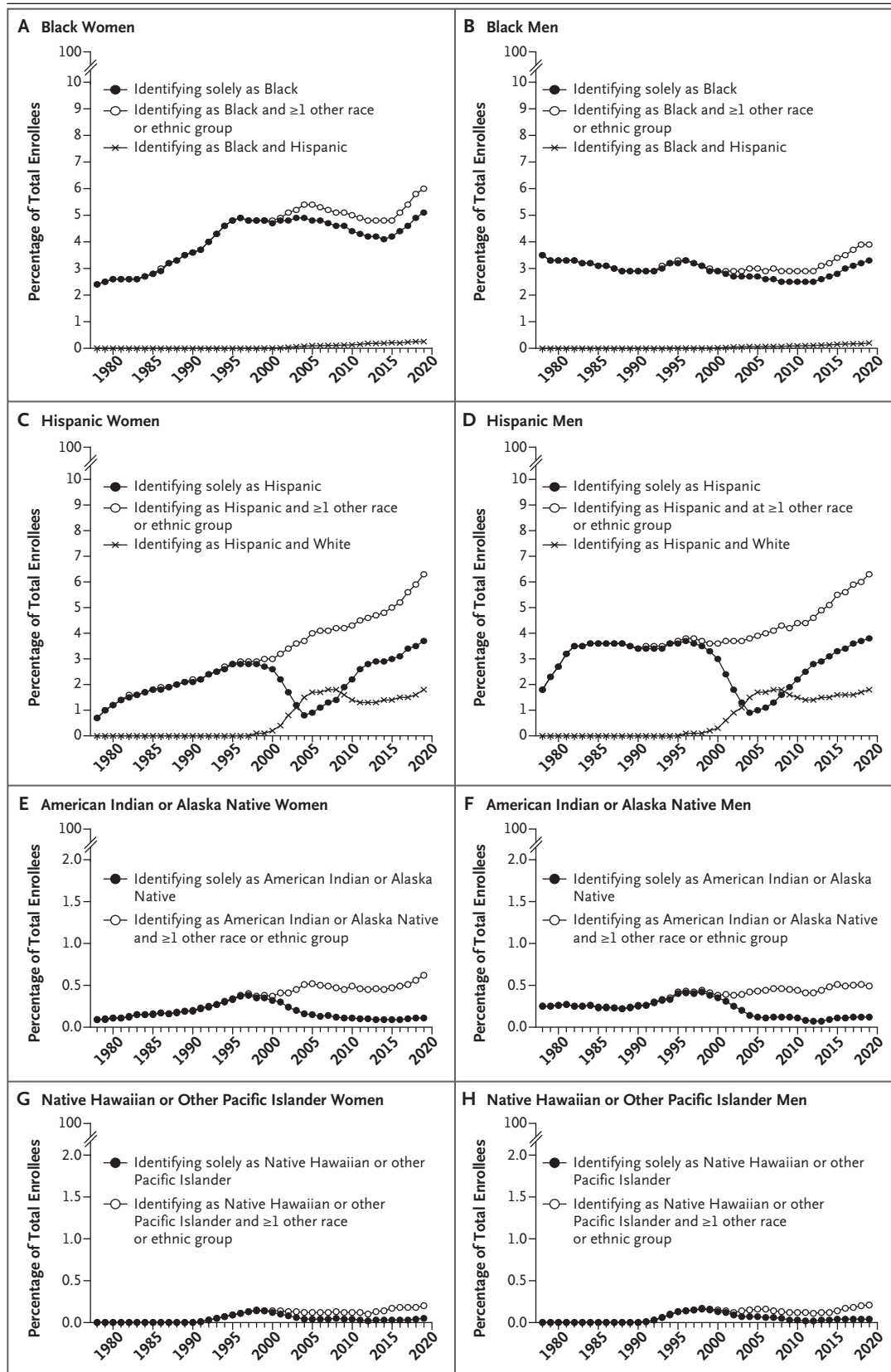
**APPLICANTS AND MATRICULATION RATES**

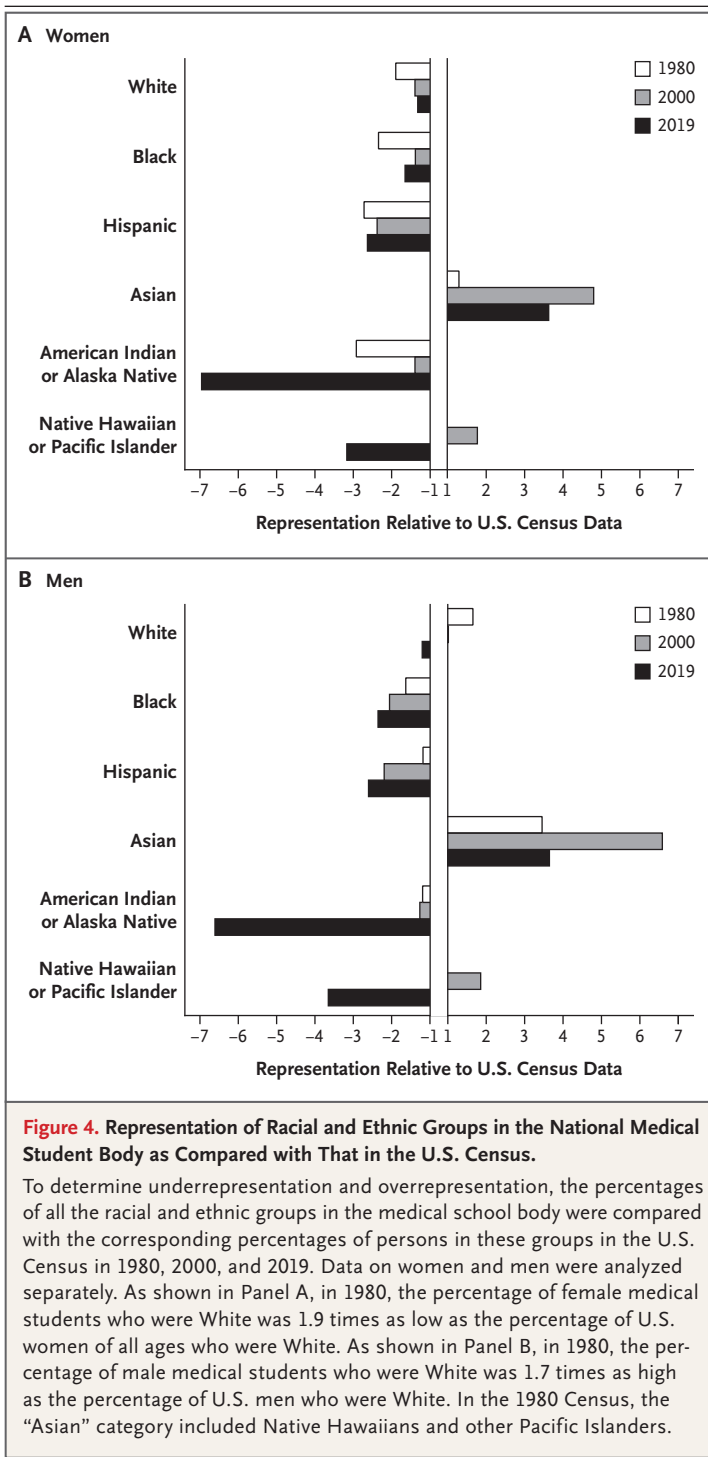
An analysis of the trends in the gender, race, and ethnic group of student applicants over the study period (Fig. S3) revealed increases in the percentages of Asian, Black, and Hispanic women. Whereas the percentage of applicants who were White men decreased by more than half during the study period, the percentage of Asian men more than doubled. In contrast, among the applicants, the percentage of men from racial and ethnic groups that are underrepresented in medicine remained stationary, as did the percentage of women who identified as American Indian or Alaska Native or as Native Hawaiian or other Pacific Islander.

There was considerable variability over the study period in matriculation rates derived from applicant and matriculant data (Fig. S4). However, the matriculation rates among men and women were similar in all six racial and ethnic groups in the study, irrespective of the status of these groups with regard to representation in medicine.

**DIVERSITY OF THE NATIONAL MEDICAL SCHOOL BODY AS COMPARED WITH THE U.S. CENSUS**

To further assess the racial and ethnic diversity of the national medical student body, we compared the percentages of enrollees who identified with at least one of the six racial and ethnic groups with the respective percentages of persons in these groups in the national Census in 1980, 2000, and 2019. As shown in Figure 4, the percentages of male enrollees who identified as Black, Hispanic, or American Indian or Alaska Native were lower at all three time points than the respective percentages of persons in these groups in the U.S. Census. In contrast, the relative representation of White, Black, and Asian women increased from 1980 through 2019; in these three racial and ethnic groups, the most





pronounced increase occurred in the percentage of Asian women (an increase from a factor of 1.3 in 1980 to a factor of 4.8 in 2000 and a factor of 3.6 in 2019). Hispanic women continued to be consistently underrepresented at all three time

points. There was a marked decrease in the percentages of men and women who identified as American Indian or Alaska Native or as Native Hawaiian or other Pacific Islander over the same period.

#### MEDICAL SCHOOL ATTRIBUTES

To further characterize the diversity of the national medical student body with respect to gender, race, and ethnic group, we explored the potential importance of several medical school attributes. As shown in Figure S5, the diversity trends in the national medical student body were similar in public and private medical schools. Similar conclusions held for the four geographic regions in the study (Fig. S6).

#### DISCUSSION

In the past four decades, U.S. medical schools have made sustained efforts to enhance the gender distribution and racial and ethnic diversity of the national medical student body. The most tangible achievement, apparent as early as 2005, was the attainment of gender parity. Regrettably, however, the racial and ethnic composition of the latest cohort of women enrollees remains uneven and largely composed of White and Asian women. The percentages of women enrollees from racial and ethnic groups that are underrepresented in medicine increased slightly over the study period but remain well below the corresponding percentages in the U.S. Census.

Among male enrollees, limited progress was also noted in the percentages of those from racial and ethnic groups that are underrepresented in medicine. There has been little progress in increasing the proportion of enrollees who are Black men.<sup>15,16</sup> In 1978, Black men accounted for 3.1% of the national medical student body. By 2019, the cognate figure was 2.9%. This lack of progress is brought into sharp focus by the fact that 15% of Black men who are currently enrolled are enrolled in historically Black medical schools. Without these schools, the percentage of enrollees who are Black men would have remained a constant 2.4% for the duration of the study period.

Relative to their proportions in the U.S. Census, both Hispanic men and Hispanic women proved to be underrepresented throughout the study period. When a single race designation

was used in the analysis, there was an apparent decrease in the representation of Hispanic enrollees of both genders. This decrease reflects changes in AAMC data-collection procedures that permitted enrollees to designate more than one race or ethnic group. By 2019, nearly half the men and women enrollees who identified as Hispanic also identified with another race or ethnic group, most notably White race. Nearly 80% of the men and women who identified as American Indian or Alaska Native or as Native Hawaiian or other Pacific Islander also identified with another race or ethnic group; nevertheless, these groups were underrepresented for the duration of the study period.

Much has been written about the relative merits of strategies to enhance the diversity of the national medical student body. Leading the way is the drive to institute “holistic review” admissions policies replete with scholastically blind interviews and community-suffused admissions committees so that balanced consideration is given to experiences, attributes, and academic qualifications.<sup>17-20</sup> In part, it is the objective of the holistic construct to reframe the Medical College Admission Test (MCAT) as but one of several indicators for admission. Recent research affirms this changing reality by showing increasing rates of acceptance of applicants with a broad range of scores on the MCAT.<sup>21,22</sup> A 2014 report on findings from a national survey concluded that the “holistic review is an effective strategy for schools that seek to increase the diversity of their student bodies.”<sup>23</sup>

Apart and distinct from the cultivation of enlightened admissions policies, more must be done to enhance the diversity of applicants in the pipeline. Investment in undergraduate bridge programs such as after-school mentoring of disadvantaged middle- and high-school students appears to be well worth the effort.<sup>24,25</sup> Consideration may also be given to a revision of current undergraduate “pre-med” constructs through the enhancement of advising, the redress of unconscious bias, and the provision of learning environments that incorporate positive reinforcement. Finally, increasing consideration must be given to medical education with reduced or free tuition in order to increase diversity.<sup>26-29</sup>

In the past four decades, major strides have been made in the representation of women in the national medical student body. However, the

proportions of enrollees from racial and ethnic groups that are underrepresented in medicine remain at levels well below their proportions in the national Census. These observations speak to a persistent failure to substantially improve the racial and ethnic diversity of the national medical student body. Future progress will require a variety of approaches, including those that may promote the diversity of the medical school applicant pool.

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