

# Comment From the Editors

## Underrepresentation of Underrepresented Minorities in Academic Medicine: The Need to Enhance the Pipeline and the Pipe

*The number of underrepresented minorities (URMs; black or African American, Hispanic or Latino, American Indian or Alaska Native, Native Hawaiian or other Pacific Islander) among US medical school faculty is markedly low when compared with their respective percent representation of the US population. Women URMs are doubly underrepresented, particularly as the academic rank advances from the instructor to the professor level, and gender discrepancies occur more prominently among white female faculty. Although the percent of white faculty has decreased over the past 5 years, the low percentage of black and Hispanic faculty has not changed proportionately. Furthermore, the 2008–2009 pipeline of URM trainees is unlikely to reverse the current trends. Several measures are suggested for consideration by medical schools and the National Institutes of Health, and recommendations that URM faculty and students may wish to consider are also discussed. The major issues to address include increasing the pipeline of predoctoral URMs, promoting the success and retention of junior URM faculty, enhancing the support of senior URM faculty to serve as needed mentors, and building a pool of URM and non-URM mentors for URM trainees. Therefore, issues pertaining to both the pipeline and the pipe need to be overcome.*

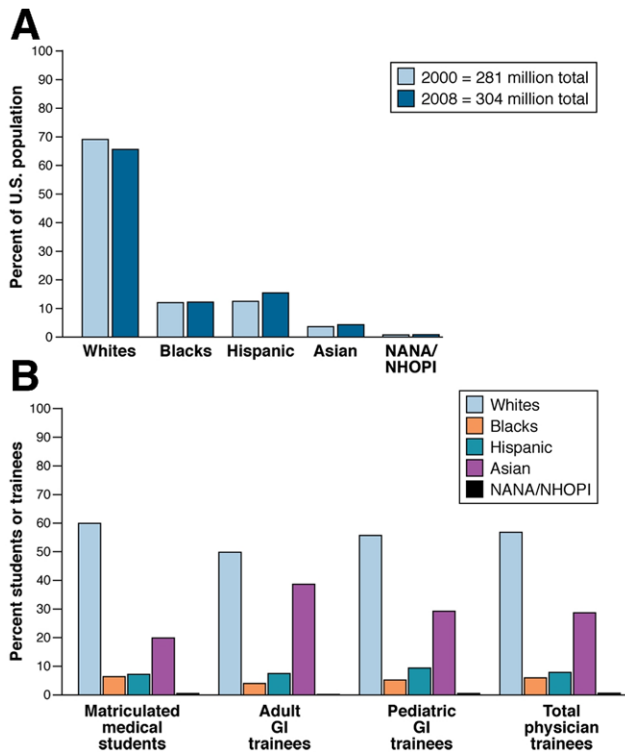
The definition of *underrepresented minorities* (URMs) varies somewhat depending upon the source, but overall the definitions are similar. The US Department of Health and Human Services defines URMs as “racial and ethnic populations who are underrepresented in a designated health profession discipline relative to the percentage of that racial or ethnic group in the total population. This definition includes Black or African American, American Indian or Alaska Native, Native Hawaiian or other Pacific Islander, Hispanic or Latino, and any Asian other than Chinese, Filipino, Japanese, Korean, Asian Indian, Thai, or Vietnamese/Southeast Asian.”<sup>1</sup> Similarly, the Association of American Medical Colleges (AAMC) states, “Underrepresented in medicine means those racial and ethnic populations that are underrepresented in the medical profession relative to their numbers in the general population” and shifts the focus from a fixed aggregation of four racial and ethnic groups, to accommodate the inclusion and exclusion of underrepresented groups on the basis of changing demographics of society and the profession. It also shifts the focus from a national per-

spective to a regional or local perspective on underrepresentation.<sup>2</sup> For the purposes of this commentary, we use the US Department of Health and Human Services definition and focus on the limited pool of URM medical school faculty using the extensive available faculty roster data from the AAMC that include 131 medical schools.<sup>3</sup> These faculty include physician scientists (eg, MDs or MD/PhDs), clinicians, scientists (PhDs), educators, and clinical investigators.

Why is the traditional definition of a URM focused on Americans of African descent, Latinos raised within the continental United States, and similarly Native Americans from Hawaii and Alaska? A recent report summarized the interviews of 25 African-American physicians and included the comments from 2 black physicians.<sup>4</sup> One physician stated that “the influence of race on self-view was shaped by the participant’s country of origin” and also stated “I wouldn’t say that race has influenced me. It defines me. It defines what I do.” By contrast, an African physician immigrating to the United States after high school stated that “race influences the personalities of

Americans much more deeply than for Africans or other people not born in this country. As an African, my primary mode of identification is not race.” Thus, the original list of URMs reflects those persons typically born in the United States that suffered under bias owing to skin color or ethnicity. Moreover, the negative bias occurred early enough in their upbringing that it impacted their educational opportunities, view of themselves, and external biases from others whether institutional or not.

**Why bother?** If the current US population continues to grow at a similar pace, nearly 50% of the 2050 US census will be non-white or a “person of color.”<sup>5,6</sup> Although with each successive generation (about 40 years or so), we clearly witness and document substantive changes ushering us toward the utopian goal of a color-blind society, the numbers bear witness to the fact that significant changes need to occur to approach this goal. With respect to health care, minority populations, which currently comprise approximately 35% of the US population (~27% are Hispanic or Black; Figure 1A), are likely to receive a higher percent of uncompensated health care (“Uncompensated care [UC] is health care that is delivered, but not paid for by either a patient or a third party payer. Most UC is delivered to the very ill during or after a visit to an emergency room. In 2004, UC was ~\$41 billion dollars”).<sup>6–8</sup> Assuming that those likely to receive uncompensated care will comprise a larger share of minority physician practices provides some impetus for increasing the number of URM practitioners and academicians. Black physicians care for significantly more black patients (25 percentage points more versus other ethnic group physicians;  $P < .001$ ) and for more patients on Medicaid (on average 45% of their patients were insured by Medicaid;  $P \leq .001$ ); Hispanic physicians care for more



**Figure 1.** US census data and distribution of matriculated medical students, gastroenterology and total physician trainees among US ethnic and race backgrounds. (A) The distribution of the different US subpopulations based on the 2000 US latest official census and the estimated 2008 US census<sup>24</sup> (rounded off to the nearest million) is shown. The population total also includes the categories of Native Hawaiian and other Pacific Islander and those with  $\geq 2$  races that are not included in the race/ethnic background analysis. The Hispanic (Latino) designation includes Mexican American, Other Hispanic, Cuban, Puerto Rican, and Multiple Hispanic. The US Census Bureau defines 5 categories of race (white, black or African American, American Indian and Alaskan native, Asian, and native Hawaiian/other Pacific Islander) and 2 categories of ethnic background (Hispanic/Latino and non-Hispanic/Latino).<sup>25</sup> NANA, Native American, Native Alaskan; NHOPI, Native Hawaiian and other Pacific Islander. (B) Details of the numbers used to generate the graph are shown in Supplemental Table 1. The numbers were collected from the 2008–2009 graduate medical education data.<sup>15</sup>

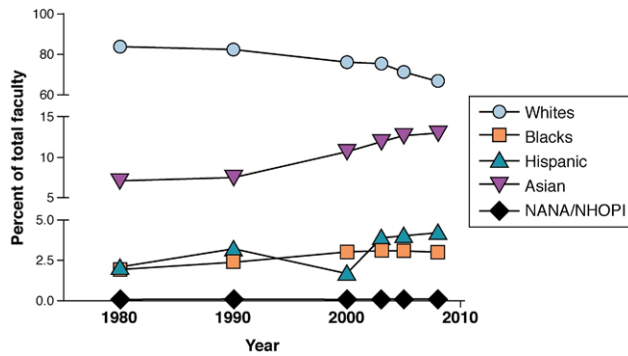
Hispanic patients (21% percentage points more;  $P < .001$ ), and more uninsured patients ( $P < .03$ ) than do other physicians.<sup>9</sup> In addition, there is evidence that black and Hispanic patients seek physicians of their own race because of personal preference or language, and not only because of geographic proximity.<sup>10</sup> Thus, simply from an economic necessity, the health care delivery system must factor in how to increase the number of physicians who will deliver health care, as well as increase the number of physician scientists, clinical investigators, and scientists who will analyze the ailments that plague these populations.

It is a reasonable assumption that most health care recipients do not care what “color” or ethnic group their physician belongs to as long as they are well trained and care about them as patients. However, black respondents with black physicians were more likely than those with non-black physicians to rate their physicians as excellent and as providers of preventative care. Similarly, Hispanic patients treated by Hispanic physicians were more likely than those treated by non-Hispanic physicians to be satisfied with their health care.<sup>11</sup> Although these conclusions are derived from data obtained  $\geq 10$  years ago, these conclusions are

likely to still hold. Thus, URM providers are more likely to serve patient populations that are a reflection of themselves, which in turn are the same populations typically listed as “the underserved.” However, statistically a majority of URMs in the United States will have a non-URM physician because URMs only comprise about 7% of practicing physicians.<sup>5</sup> Therefore, from an educational perspective, academic medical faculty who are training the next generation of physicians as well as those delivering health care should reflect the diverse populations they will be serving.

Enhancing the pool of URM trainees and academic physicians will likely alleviate the present disparities in the quality of health care that relate to specific measures of health care delivery and URM populations. For example, the 2008 National Health Care Disparities Report indicates that blacks were more likely to be diagnosed at an advanced stage with colorectal cancer than whites (104 vs 80 per 100,000, respectively).<sup>12</sup> In addition, Hispanics were less likely than non-Hispanic whites in 2005 to receive colorectal cancer screening (37.3% vs 58.5%).<sup>12</sup> However, URM disparities in health care are complicated and relate to several other benchmarks such as income, level of education, and access to health care. Regardless, the number of matriculated black and Hispanic medical students is also not representative of these 2 minority groups in the US population (Figure 1B), which is an additional impetus for promoting predoctoral URM students to pursue health-related disciplines.

In addition to the societal needs to increase the pool of URM trainees and academic physicians, there are several other tangible benefits. These benefits include providing a pool of mentors for students, to better serve patients, to make the medical center a more diverse and interesting place,



**Figure 2.** Faculty ethnicity and race distribution in the United States. Details of the numbers used to generate the graph are shown in Supplemental Table 1, and represent the numbers for 1980, 1990, 2000, 2003, 2005, and 2008 for the sum of all faculty (professors, associate professors, assistant professors, and instructors). The data were collected from AAMC Faculty Roster<sup>3</sup> and publications.<sup>26</sup>

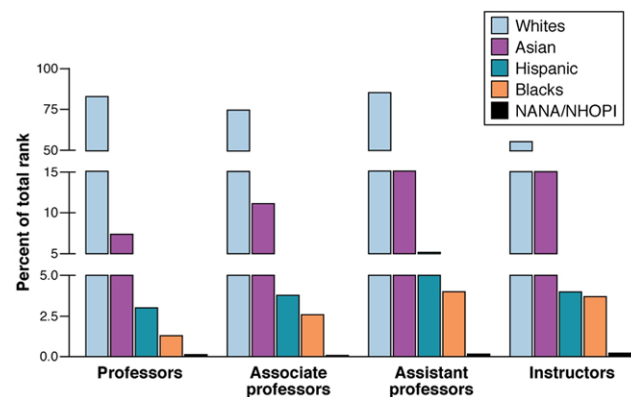
to bring different points of view to debates, and to provide a pool of researchers and clinical investigators who bring a different perspective to their scholarly activities. Diversity in medicine is a win-win goal that improves the institution and the educational experience.<sup>13</sup> Of note, Project 3000 by 2000, which began in 1990 as a AAMC initiative, intended to enroll 3000 URM students in US medical schools by 2000.<sup>14</sup> This is indeed a laudable effort, but it remains to be met; even in 2007 the total number of matriculated URM students was approximately 2500 (Supplemental Table 1 [vs 1470 URM enrollees in 1990]).

**Current statistics and issues pertaining to academic physicians.** The US population shows ethnic/race fluctuations over time (Figure 1A), with a drop between the 2000 census and the estimated 2008 census in the percent of whites (69.1% vs 65.6%) compared with an increase in Hispanics/Latinos (12.5% vs 15.4%), and the limited increase in blacks (12% vs 12.2%). However, the percent of faculty has not changed significantly between 1990 and 2008 for blacks (now ~3%) or Hispanics (now ~4%; Figure 2), which reflects in large part the persistent issue of underrepresentation of these populations and the Native American/Alaskan group as compared with their US population distribution.

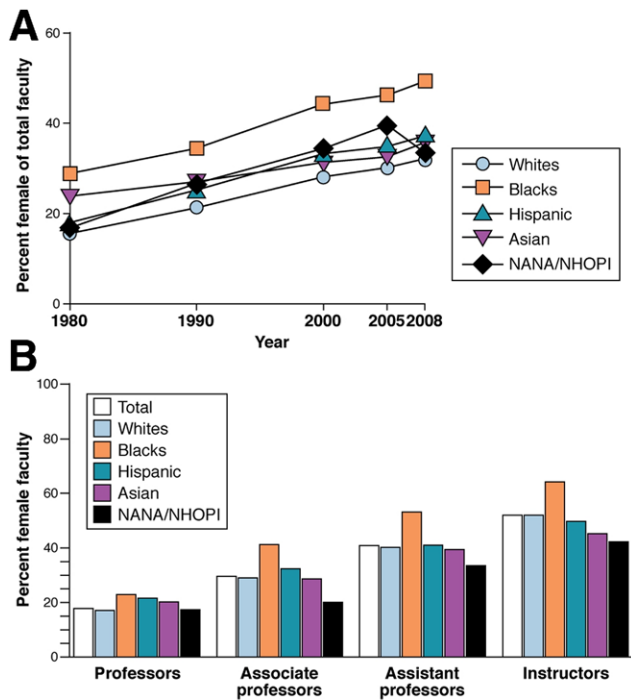
The decrease in the relative population of whites (Figure 1A) parallels the relative decrease in white medical school faculty (Figure 2), whereas Asian faculty has increased representation within medical school faculties as compared with their relative population in the United States. Although there is an overall increase in total black and Hispanic faculty when comparing 1980 with 2008, the disturbing trend for blacks is that, since 2000, there has not been a change in the percent of total black faculty in the United States (Figure 2). The one slight improvement is that the number of black assistant professors has in-

creased from 2% of total assistant professors in 1980 to 4.1% in 2000 (data not shown); however, this is unchanged in 2008 (Figure 3). Within the Hispanic faculty group, the “Other Hispanic” category is the largest (67.5%) and Cuban Hispanics represent the smallest group (1.2%), which does not reflect their representation in the US census (Figure 3). An accurate breakdown with respect to ethnic background and academic versus community practice affiliation is presently not available from the major gastroenterology societies including the American Gastroenterological Association, the American Association for the Study of Liver Diseases, the American College of Gastroenterology, or the American Society for Gastrointestinal Endoscopy.

Another important statistic to highlight is that, for all ethnic groups during 2008 except for blacks, the total percentage of male outnumber female faculty by 1.7- to 2.1-fold, with whites having the greatest male-to-female ratio of medical school faculty among all other ethnic groups (Figure 4A; Supplemental Table 2). In addition, and equally striking, is that the percentage of females at the rank of



**Figure 3.** Faculty rank distribution as related to ethnicity and race. Details of the numbers used to generate the graph are shown in Supplemental Table 1 and correspond to AAMC Faculty Roster<sup>3</sup> and publications for 2008.<sup>26</sup> Within the Hispanic group of 5,048 total faculty in 2008, the subgroup percentages are 1.2% Cuban, 13% Mexican, 18.3% Puerto Rican, and 67.5% other Hispanic. In terms of the latest official US census for 2000, the distribution of the 35.3 million Hispanics is 3.2% Cuban, 58.4% Mexican, 9.6% Puerto Rican, and 28.8% other Hispanic.<sup>24</sup>



**Figure 4.** Distribution of female and male faculty by rank and ethnicity/race. Details of the numbers used to generate the graphs are shown in Supplemental Tables 2 (for panel A) and 3 (for panel B, year 2008). (A) Percent female faculty for each of the race/ethnic backgrounds. The data were obtained from the AAMC Faculty Roster and excludes faculty with missing gender data.<sup>3,7</sup> NANA corresponds to Native American, Native Alaskan; and NHOPI represents Native Hawaiian and other Pacific Islander.

professor ranged between 16.2% and 17.7% in 2006 and 2008, respectively (Supplemental Table 3), and this disproportionate number of women at the professor rank cuts across all ethnicities and races (Figure 4B). Notably, the percent of total female faculty shows a progressive decline from the instructor to the professor rank (Figure 4B). Also important to highlight is the selective lower ratio of male-to-female total black physician trainees

(0.75 in 2008–2009 for blacks vs 1.16–1.31 for the remaining groups; Supplemental Table 4). The ratio of male-to-female trainees has shifted significantly toward equalization across all ethnic backgrounds during the past 10 years (eg, it was 1.62–1.81 male-to-female during 1998–1999), except for black trainees (Supplemental Table 4). The potential reasons for the selectively low male-to-female black trainee ratio merits further assessment.

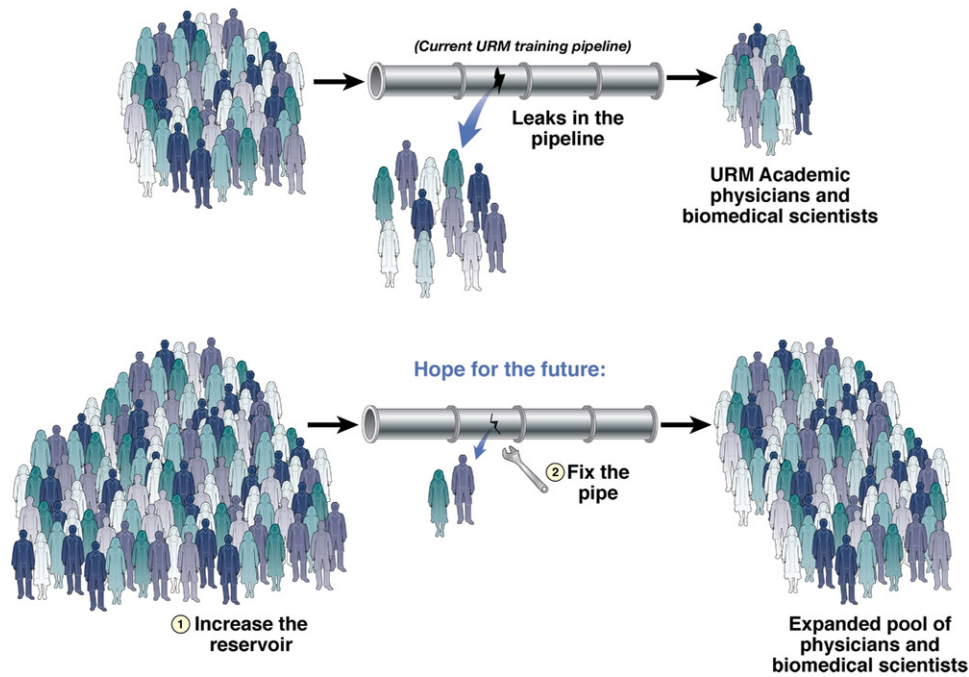
Therefore, the major issues that need to be addressed include increasing the pipeline of URMs, promoting the success and retention of junior URM faculty, enhancing the support of senior URM faculty to serve as the needed mentors, and expanding the pool of URM and non-URM mentors for URMs. One statistic that exemplifies the apparent lack of retention of black assistant professors is their low ratio of associate to assistant professors (32%–34%) in 2000–2008, which may be taken as a reflection of lack of retention, as compared with that of whites (65%–66%) and Hispanics (38%–43%; Table 1). Similar trends are found when comparing the ratio of professors to associate professors. Unfortunately, the pipeline based on the most recent 2008–2009 figures<sup>15</sup> does not seem promising when analyzing the number of adult or pediatric gastroenterology trainees or total resident physicians in ACGME-accredited and in combined specialty graduate medical education programs (Figure 1B; Supplemental Table 1).

As with any dataset, there are potential caveats. The data shown in Figures 1–4 represent statistics of full-time faculty and does not include volunteer or part-time faculty. Another potential limitation is the possibility of incomplete or biased reporting. Regardless, the numbers are striking enough such that the conclusions are likely to hold.

**Table 1.** Relative Estimates of Promotions When Comparing Transitions from 2000 to 2008\*

	White			Hispanic			Black		
	Assistant	Associate	Professor	Assistant	Associate	Professor	Assistant	Associate	Professor
2000	28,485	18,672	22,139	1,859	800	678	1,648	564	311
2008	30,175	19,676	24,803	2,636	1,011	912	2,054	674	394
Percent ratio of Assoc to Assis									
2000		66%	—		43%	—		34%	—
2008		65%	—		38%	—		32%	—
Percent ratio of Prof to Assoc									
2000	—		119%	—		85%	—		55%
2008	—		126%	—		90%	—		59%

\*Numbers are derived from AAMC institutional member access to Faculty Roster data. Assoc, Associate Professors; Assis, Assistant Professors; Prof, Professors.



**Figure 5.** Two major goals are required to address underrepresentation of URM in academic medicine. Two areas need to be addressed in order to enhance the number of URM academic physicians and biomedical scientists. First is to increase the pool of URM who pursue health-related sciences by attracting graduate/medical, undergraduate and high school students. Second is to develop strategies to retain junior trainees and faculty members.

**Recommendations to the system at large.** The low representation and the stagnation of the numbers of Black and Hispanic faculty in US medical schools, which is mirrored in adult and pediatric gastroenterology and matriculated medical students (Figure 1), are troubling. Significant efforts by the National Institutes of Health (NIH) and medical schools to promote diversity have been in place but the impact has not been as rewarding as one would have hoped or anticipated. This conclusion is based on the trends and data that are collected by the AAMC and the American Medical Association.<sup>3,15</sup> Some of the issues were articulated by black high school juniors in a Milwaukee public high school where 89% of the students are black. Students stated that, from their perspective, the major barriers to becoming a physician include financial constraints, lack of knowledge about the medical field, limited encouragement at home or school, negative peer pressure, lack of

black role models, racism in medicine, and better alternatives for securing a high income.<sup>16</sup> These sentiments provide clear aspects that need to be addressed. We envision several specific suggestions that might contribute to reversing the current trend (Figure 5) as follows.

1. Work to increase the pipeline by targeting undergraduate and even high school students to pursue biomedical fields.<sup>17</sup> Efforts along these lines are ongoing as exemplified by the NIH/NIDDK Short-Term Education Program for Underrepresented Persons (STEP-UP) program which provides research opportunities to high school and undergraduate students at 7 institutions.<sup>18</sup> Another successful program is the NIH/NIGMS Minority Biomedical Research Support, which has several components including those that provide support via the R25 grant mechanism to institutions with

$\geq 50\%$  student enrollment from URM groups or to provide support to institutions that train URM.<sup>19</sup> Similar R25 programs include the recent NIH/NHLBI Request for Application (RFA-HL-10-013) to provide short-term research training to promote diversity in undergraduate and health professional student populations. Another successful predoctoral program contributing to the pool of URM for graduate or professional studies is the NIH/NIGMS Minority Access to Research Careers program that has several URM-related components, including undergraduate student T34 training awards, predoctoral F31 fellowships, faculty senior F33 fellowships, and ancillary training activities T36 awards.<sup>20</sup> However, there is variability in the R25 programs; some provide minimal administrative and mentor support to encourage training institutions

- and investigators to seek out such offerings. Additional incentives to promote training of URM, including mentor and program organization support should be made available.
2. Joint city/state/private and university/college affiliation efforts. This can be best exemplified by The Preuss School UCSD, a joint venture between the San Diego Unified School District and the University of California San Diego (funded entirely by community donors) and accepts students for enrollment in grades 6–12. The criteria for enrollment include a low family income, based on defined federal guidelines, and having parents/guardians who are not graduates of a 4-year college or university. Notably, the current enrollment is 59% Hispanic and 12% blacks.<sup>21</sup>
  3. Another important issue is the lack of mentors. This may be overcome in part by increasing the pool of interested non-URM mentors to mentor URMs, given that the pool of URM mentors is simply insufficient. Such “URM equivalents” can, with time, increase the pipeline of academic URMs but they need to be encouraged and incented to do so. An example of the positive impact of committed non-URM mentors, is the Robert Wood Johnson Foundation sponsored Harold Amos Medical Faculty Development Program (formerly the RWJ Minority Medical Faculty Development Program) that over the 25 years of the program can boast of 204 URM alumni with >80% presently in an academic setting (38 full professors, 55 associate professors, 73 assistant professors, 1 astronaut, 1 University president, and 2 NIH Institute directors). The success of the program attracted participation by a major medical subspecialty to support 1 fellowship slot. By evaluating the mentors along with the applicants, a central tenet of the program continues to be strong mentorship, which has contributed to its overwhelming success.<sup>22</sup>
  4. Medical schools might consider including in their mission statements “the improvement of the health of underserved and disadvantaged populations” in addition to the typical “excellence in research, education and clinical service.” This might better resonate with URM individuals. An analogy to this is that many women pursue the biomedical fields with the goal of improving women’s health, and one can argue that the increased focus on (and advances in) women’s health has coincided with an increasing percentage of women faculty in our medical schools (Supplemental Table 2). Given that this ultimate service is what much of the US taxpayer base expects of academic institutions, our institutions can achieve this in part by recruiting more URM individuals into the academic ranks. In the future, those medical schools which achieve such mission-based diversity are likely to outcompete other institutions with respect to success in health care delivery to all, and likely in terms of grant funding, particularly for clinical research.
  5. Establish diversity deans and directors at the level of the school and department, respectively, which garner legitimacy among senior faculty and administrators to accomplish major goals. These individuals should have several responsibilities including mentoring roles in relation to faculty appointment and evaluation, diversity program development, with the inclusion of a budget to promote diversity initiatives.
  6. Provide subsidized and protected time to URM faculty to engage in mentoring opportunities within their institution. Many times, these faculty are stretched to serve on numerous committees and URM mentoring activities.
  7. Encourage participation of accomplished URM and non-URM faculty in initiating and engaging in community activities such as giving talks at local and regional high schools and URM colleges. The obvious goal of this effort is to enhance the pipeline of URMs who become interested in biomedical sciences. Such presentations can be used as a tool to recruit students to programs that are available at the speakers’ home institutions. One way to encourage these types of presentations is to include them as part of NIH-supported efforts.
  8. Consider establishing institutional endowments to support the training of URMs, with potential limited stipends for the mentors.
  9. Establish intra- and inter-institutional programs to track the efforts undertaken to promote diversity.
  10. Create a supportive environment to minimize the attrition of women URMs and promote the recruitment of female URM trainees.
  11. Establish an NIH-wide initiative to address URM underrepresentation in the biomedical and clinical arenas. Such an initiative is likely to help scale up institutional, state, and local government support and effort, and to play a cornerstone role in reversing the current stagnation. Clearly, a multidimensional approach is needed but a big push by the NIH will likely help to ignite the momentum.

**Recommendations to the URMs.** The URMs themselves play a critical role in promoting diversity, and in that capacity need to proactively undertake several measures.

First, URM students should seek out mentors and role models early on, and it is important to highlight that these mentors need not come from an URM background. One concrete example is reflected by one of the authors of this commentary (J.L.M.) who sought out mentors (Fred Gorelick, Tadataka Yamada) who were not URMs, but who were instrumental in helping promote J.L.M.'s career as would any outstanding mentor irrespective of ethnicity or race. A second important reminder to the URMs is to network and to take it upon themselves to strive to be role models and mentors to those junior to them. The latter is a responsibility that brings the joy and fulfillment of witnessing the success of a trainee. Third, URMs need to support and participate in diversity-promoting programs and increase their visibility within their own institutions. However, this may spill into what may be termed the "minority tax" (eg, "Black tax," "Hispanic tax"), which reflects on the appointment of URM faculty to more committees than their non-URM colleagues. This is a challenge that URMs need to balance with the need for adequate protected time for their own academic progress. Fourth, the recognition by URMs and non-URMs alike that promoting diversity, while doing so not at the expense of underserving any trainee no matter what color or creed, is ultimately uplifting to our society at large. Fifth, the need by URMs to exercise and cultivate their resilience to enhance their academic productivity. Examples of important resilience measures (which of course help any minority or majority) include clarity of goals and priorities, spirituality, family support, having a sense of humor, hard work, learning to organize and multitask, being able to say no, and assertiveness.<sup>23</sup> Fifth, the realization by the URMs that their abilities to achieve are limitless, and that many of the overt barriers that may have interfered with their

success in the past are now less evident.

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### Supplementary Data

Note: To access the supplementary material accompanying this article, visit the online version of *Gastroenterology* at [www.gastrojournal.org](http://www.gastrojournal.org), and atdoi:10.1053/j.gastro.2009.11.017.

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**Supplemental Table 1.** Faculty Ethnicity and Race Roster Comparison With US Subpopulations

	Whites	Blacks	Hispanic*	Asian	NANA/NHOPI	Comments
Professors (% total) 2008	24803 (82.8)	394 (1.3)	912 (3)	2213 (7.4)	16 (0.05)	29,948 total
Asso Prof (% total) 2008	19676 (74.5)	674 (2.6)	1011 (3.8)	2931 (11.1)	12 (0.05)	26,400 total
Assis Prof (% total) 2008	30175 (58.4)	2054 (4)	2636 (5.1)	8598 (16.6)	79 (0.15)	51,662 total
Instructors (% total) 2008	7748 (55.2)	521 (3.7)	565 (4)	2092 (14.9)	33 (0.24)	14,027 total
All faculty 2008	83967 (67)	3714 (3)	5240 (4.2)	16277 (13)	143 (0.11)	125,215 total
All faculty 2005	81906 (71.3)	3548 (3.1)	4641 (4)	14595 (12.7)	124 (0.1)	114802 total
All faculty 2003	79540 (75.3)	3305 (3.1)	4091 (3.9)	12531 (11.9)	108 (0.1)	105,676 total
All faculty 2000	77819 (76.2)	3066 (3.0)	1753 (1.7)	10887 (10.7)	104 (0.1)	102,160 total
All faculty 1990	60722 (82.4)	1800 (2.4)	2325 (3.2)	5533 (7.5)	64 (0.1)	73,661 total
All faculty 1980	44956 (83.7)	1013 (1.9)	1134 (2.1)	3807 (7.1)	48 (0.1)	53,682 total
No.† (% of US Population) 2008	199.5 (65.6)	37.2 (12.2)	46.9 (15.4)	13.2 (4.3)	2.3 (0.8)	304.1 estimated US population <sup>‡</sup>
No. (% of US Population) 2000	194.5 (69.1)	33.9 (12)	35.3 (12.5)	10.1 (3.6)	2.1 (0.75)	281.4 actual US population
% and number of matriculated medical students	59.9% 10,632 (49.5% female)	6.4% 1,139 (62.9% female)	7.2% 1,277 (49.8% female)	19.9% 3,535 (49.6% female)	0.5% 89 (50.6% female)	Data shown for 2007
% of adult GI specialty trainees	49.8%	4%	7.5%	38.6%	>0.2%	Total = 1,304 trainees
% of pediatric GI specialty trainees	55.7%	5.2%	9.4%	29.2%	0.5%	Total = 212 trainees
% of total physician trainees	56.8%	6%	7.9%	28.7%	0.6%	Total = 102,386 trainees

NANA, Native American, Native Alaskan; NHOPI, Native Hawaiian and other Pacific Islander.

\*Includes Mexican American, Other Hispanic, Cuban, Puerto Rican and multiple Hispanic. The US Census Bureau defines 5 categories of race (white, black, or African American, American Indian and Alaskan native, Asian, and native Hawaiian/other Pacific Islander and 2 categories of ethnic background (Hispanic/Latino and non-Hispanic/Latino).<sup>24</sup>

<sup>†</sup>Rounded off to nearest million using estimated 2008 US Census Bureau data.<sup>23</sup>

<sup>‡</sup>The population total also includes the categories of Native Hawaiian and other Pacific Islander and those with 2 or more races which are not included in the race/ethnic background analysis. The data was collected from AAMC Faculty Roster<sup>3</sup> and publications.<sup>25</sup>

**Supplemental Table 2.** Male and Female Faculty Distribution Based on Ethnicity and Race\*

	1980	1990	2000	2003	2005	2007	2008
White							
Male	37,879	47,601	55,787	56,226	57,265	58,729	56,899
Female (% total)	7,020 (15.6)	12,989 (21.4)	21,811 (28.1)	23,314 (29.3)	24,641 (30.1)	27,293 (31.7)	26,806 (32.0)
Black							
Male	719	1,177	1,704	1,820	1,909	1,948	1,877
Female (% total)	292 (28.9)	617 (34.4)	1,352 (44.2)	1,485 (44.9)	1,640 (46.2)	1,820 (48.3)	1,827 (49.3)
Hispanic							
Male	1,094	1,730	2,579	2,682	3,012	3,321	3,279
Female (% total)	239 (17.9)	587 (25.3)	1,280 (33.2)	1,409 (34.4)	1,629 (35.1)	1,948 (36.9)	1,945 (37.2)
Asian							
Male	2,900	4,028	7,447	8,562	9,832	10,682	10,439
Female (% total)	901 (23.7)	1,493 (27.0)	3,391 (31.3)	3,969 (31.7)	4,763 (32.6)	5,744 (35.0)	5,785 (35.7)
Native							
Male	40	47	68	67	75	233	95
Female (% total)	8 (16.7)	17 (26.6)	36 (34.6)	41 (38.0)	49 (39.5)	118 (33.6)	48 (33.6)

\*The table was derived from AAMC Faculty Roster and publications and excludes faculty with missing gender data.<sup>3,7</sup>

Native corresponds to Native American, Native Alaskan, Native Hawaiian and other Pacific Islander.

**Supplemental Table 3.** Distribution of Faculty by Gender, Rank, and Ethnicity/Race\*

	2006 Total	2007 Total	2008 Total	2008 White	2008 Black	2008 Hispanic	2008 Asian	2008 Native
Professor								
Male	24,245	24,696	24,535	20,465	300	712	1,761	19
Female (% of total)	4,682 (16.2)	5,065 (17.0)	5,268 (17.7)	4,225 (17.1)	89 (22.9)	196 (21.6)	445 (20.2)	4 (17.4)
Associate professor								
Male	18,824	18,612	18,534	13,917	396	680	2,087	20
Female (% of total)	7,339 (28.1)	7,516 (28.8)	7,745 (29.5)	5,691 (29.0)	276 (41.1)	324 (32.3)	830 (28.5)	5 (20.0)
Assistant professor								
Male	30,708	30,622	30,426	18,004	961	1,551	5,196	156
Female (% of total)	19,515 (38.9)	20,237 (39.8)	20,976 (40.8)	12,101 (40.2)	1,091 (53.2)	1,080 (41.0)	3,379 (39.4)	79 (33.6)
Instructor								
Male	7,186	6,915	6,776	3,710	186	283	1,143	37
Female (% of total)	7,162 (49.9)	7,253 (51.2)	7,210 (51.6)	4,025 (52.0)	334 (64.2)	282 (49.9)	942 (45.2)	27 (42.2)

\*The table was derived from AAMC data and excludes faculty with missing gender data.<sup>3,7</sup>

Native corresponds to Native American, Native Alaskan, Native Hawaiian and other Pacific Islander.

**Supplemental Table 4.** Male to Female Ratios of Total Physician Trainees\*

Total Trainees	Whites	Blacks	Hispanics	Asian	NANA/ NHOPi†	Total
2008–2009	1.31	0.75	1.23	1.16	1.13	1.22
1998–1999	1.77	0.94	1.81	1.62	1.58	1.68

NANA, Native American, Native Alaskan; NHOPi, Native Hawaiian and other Pacific Islander.

\*The ratio are based on American Medical Association numbers kindly provided by Dr. Sarah Brotherton.

†The 1998–1999 categorization of Asian included Native Hawaiian and other Pacific Islander.