

WHITE PAPER

Diversity, Inclusion, and Equity: Evolution of Race and Ethnicity Considerations for the Cardiology Workforce in the United States of America From 1969 to 2019

Norman C. Wang , MD, MS

ABSTRACT: Since 1969, racial and ethnic preferences have existed throughout the American medical academy. The primary purpose has been to increase the number of blacks and Hispanics within the physician workforce as they were deemed to be “underrepresented in medicine.” To this day, the goal continues to be population parity or proportional representation. These affirmative action programs were traditionally voluntary, created and implemented at the state or institutional level, limited to the premedical and medical school stages, and intended to be temporary. Despite these efforts, numerical targets for underrepresented minorities set by the Association of American Medical Colleges have consistently fallen short. Failures have largely been attributable to the limited qualified applicant pool and legal challenges to the use of race and ethnicity in admissions to institutions of higher education. In response, programs under the appellation of diversity, inclusion, and equity have recently been created to increase the number of blacks and Hispanics as medical school students, internal medicine trainees, cardiovascular disease trainees, and cardiovascular disease faculty. These new diversity programs are mandatory, created and implemented at the national level, imposed throughout all stages of academic medicine and cardiology, and intended to be permanent. The purpose of this white paper is to provide an overview of policies that have been created to impact the racial and ethnic composition of the cardiology workforce, to consider the evolution of racial and ethnic preferences in legal and medical spheres, to critically assess current paradigms, and to consider potential solutions to anticipated challenges.

Key Words: cardiology ■ diversity ■ ethnicity ■ race ■ workforce

Affirmative action as national policy for the medical profession originated in 1969, when the Association of American Medical Colleges (AAMC) established the Office of Minority Affairs.¹ Blacks, Hispanics, Asians, and American Indians had all been subject to de jure segregation in the American educational system.^{2–5} Blacks were the primary group considered for preferential admissions given the history of slavery⁶ and their numerical percentage of the total population. In 1960, the racial and ethnic composition of the United States was estimated at 85% white, 11% black, 3.5% Hispanic, and 0.6% Asian.⁷ Yet despite 5 decades, efforts to increase numbers

of individuals from “underrepresented in medicine” groups have stagnated as both medical student graduates and cardiologists.^{8,9}

Affirmative action for the cardiology workforce has historically focused on medical schools as they are “the first formal step on the career path to cardiology” (Figure 1).¹⁰ Recently, affirmative action programs that will directly impact cardiovascular disease training programs have been created under the appellation of diversity, inclusion, and equity. The 2 most prominent are the 2018 American College of Cardiology (ACC) Diversity and Inclusion Initiative and the 2019 Accreditation Council for Graduate

Correspondence to: Norman C. Wang, MD, MS, Heart and Vascular Institute, University of Pittsburgh Medical Center, 200 Lothrop Street, South Tower, 3rd Floor, Room E352.9, Pittsburgh, PA 15213. E-mail: wangnc@upmc.edu

For Sources of Funding and Disclosures, see page 15.

© 2020 The Authors. Published on behalf of the American Heart Association, Inc., by Wiley. This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

JAHA is available at: www.ahajournals.org/journal/jaha

Nonstandard Abbreviations and Acronyms

AAMC	Association of American Medical Colleges
ACC	American College of Cardiology
ACGME	Accreditation Council for Graduate Medical Education
LCME	Liaison Committee for Medical Education
MCAT	Medical College Admission Test

Medical Education (ACGME) Common Program Requirements diversity directive.^{11,12} These build upon the Liaison Committee for Medical Education (LCME) MS-8 and IS-16 diversity standards issued for medical schools in 2009.¹³

The purpose of this white paper is to provide an overview of policies that are intended to impact the racial and ethnic composition of the cardiology workforce. The focus will be on the largest groups considered by the US Census and diversity programs: white (including Middle Eastern or North African), African American (or black), Hispanic (or Latino), and Asian. American Indians or Alaskan Natives, Native Hawaiians or Pacific Islanders, and other groups are difficult to analyze and to build programs around given smaller numbers. The evolution of racial and ethnic preferences in legal and medical spheres will be considered. Critical assessment of current paradigms and potential solutions to anticipated challenges will be presented.

AFFIRMATIVE ACTION IN MEDICINE AND CARDIOLOGY

Prelude (Pre-1969)

“We the People of the United States, in Order to form a more perfect Union...”

- Preamble, The Constitution of the United States.¹⁴

A contradiction of the United States at its genesis was evident in what would later be known as the American Dilemma.^{6,15} As the Founding Fathers based the nascent nation on the axiom that “all Men are created equal,” they “openly compromised this principle of equality with its antithesis: slavery.”⁶ The journey toward reconciliation culminated in the civil rights era of the mid-1950s and 1960s.

The primary pieces of legislation that dismantled de jure segregation were the Civil Rights Act of 1964 and Executive Order 11246, signed in 1965.¹⁶⁻¹⁹ The Civil Rights Act of 1964 addresses higher education in Title VI and employment in Title VII. Executive Order 11246 mandates affirmative action programs for employment for qualifying recipients of federal contracts and sub-contracts.^{17,19} These include employers with ≥50 employees and contracts of \$50 000 or more. Therefore, most academic medical centers are obligated to “identify and eliminate impediments to equal employment opportunity” and to conduct outreach for minorities by “good faith efforts.”¹⁷ Yet it stipulates that employers are bound to “ensure that employees and applicants are treated without regard to race.”

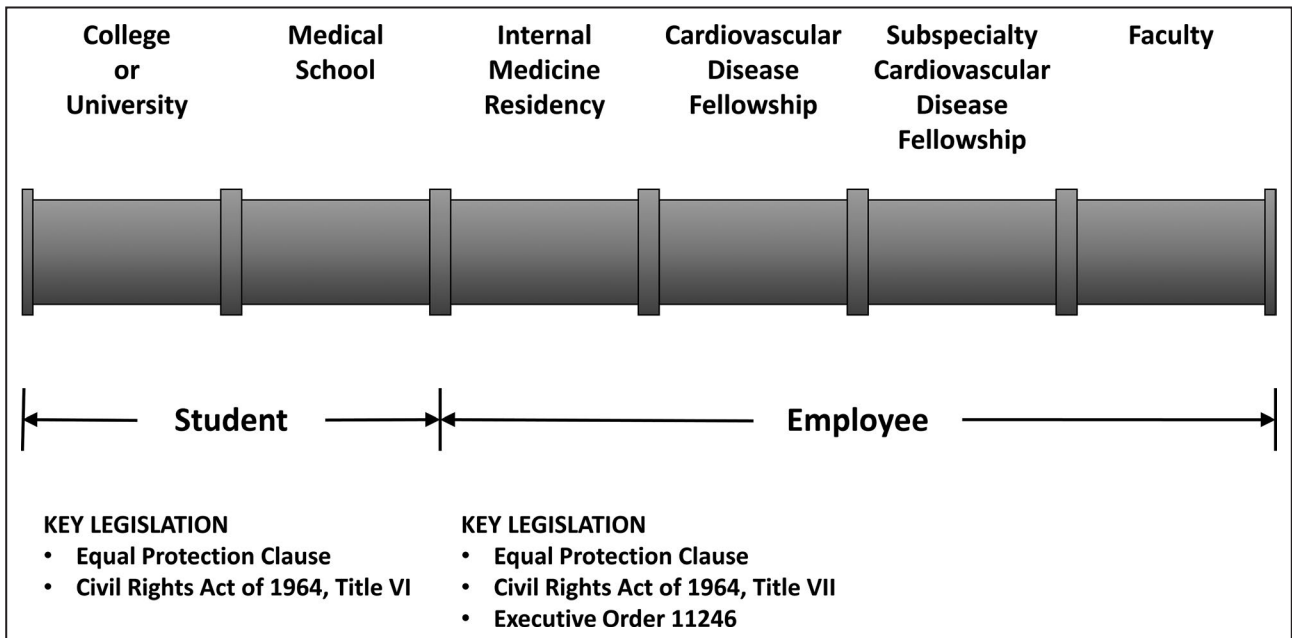


Figure 1. The academic cardiology pipeline and key legislation.

Overarching protections at the individual level is the Equal Protection Clause of the Fourteenth Amendment to the Constitution of the United States.¹⁴ A Civil War amendment, it was ratified in 1868. It stipulates, “No state shall ... deny to any person within its jurisdiction the equal protection of the laws.” In *the Supreme Court decision for Missouri et al v Jenkins et al*, Associate Justice Clarence Thomas addressed the separate but equal doctrine in public education and stated, “At the heart of this interpretation of the Equal Protection Clause lies the principle that the government must treat citizens as individuals, not as members of racial, ethnic, or religious groups.”²⁰

Affirmative action regarding race and ethnicity consists of mandatory elimination of the remnants of de jure segregation and voluntary preferences for race and ethnicity to assist those impacted by prior exclusion.^{18,19} Voluntary preferences for medical school admissions were created toward the end of the civil rights era to bring more individuals from historically marginalized groups into the profession. For many, the justification was atonement and reparation.²¹ These were largely implemented in response to the assassination of the Reverend Martin Luther King, Jr., on April 4, 1968, and subsequent riots.²² King had viewed race-based affirmative action, including quotas, as a form of reparation.²³

Phase 1 (1969–1974)

The 2 primary objectives put forth by the AAMC Office of Minority Affairs were to focus on groups that were underrepresented in medicine and to advocate for population parity, or proportional representation.^{1,24} These groups included blacks, Native Americans, Mexican Americans, and mainland Puerto Ricans. At the time, blacks were estimated at 12% of the population, while accurate data for other groups were not available.

This period was characterized by a rapid increase in “underrepresented in medicine” medical school matriculants as de jure discrimination was dismantled and racial and ethnic preferences were installed.²⁴ The AAMC short-term goal of achieving 12% by 1975 was not met as representation for blacks and total underrepresented minorities were 7.5% and 9.8%, respectively, in 1974.¹ Optimistically, black graduates produced by historically white medical schools increased from 24% to 80% in 1 decade. It later became apparent that the AAMC short-term goal was missed because of a paucity of qualified candidates, particularly blacks.²⁵

Phase 2 (1974–1990)

This era was a “period of stagnation” for underrepresented minorities.²⁴ Holistic admissions processes

were created, and 2-track systems, emphasizing objective academic scores for 1 group and subjective criteria for the other group, raised the question of “what are the standards for *graduation*?”²⁶ Severe academic difficulties for underrepresented minorities were noted as early as the mid-1970s.²⁷

A pivotal legislative event was the 1978 Supreme Court decision for *Regents of the University of California v Bakke*.⁶ Alan Bakke was a white applicant who was denied entry into the University of California at Davis School of Medicine. A special minority admissions program reserved 16 of 100 total places in the entering class. Bakke’s academic qualifications were competitive with regular matriculants and far exceeded special program matriculants. The medical school had offered 4 rationales for this program: (1) “reducing the historic deficit of traditionally disfavored minorities in medical schools and the medical profession”; (2) “countering the effects of societal discrimination”; (3) “increasing the number of physicians who will practice in communities currently underserved”; and (4) “obtaining the educational benefits that flow from an ethnically diverse student body.” Only diversity was deemed a “constitutionally permissible goal.”⁶ Creation of the diversity rationale by Associate Justice Lewis F. Powell, Jr, was a compromise, as the other 8 justices were split. It allowed for preferences but without the historic discrimination rationale, which he deemed “an amorphous concept of injury that may be ageless in its reach into the past.”

In a partial dissent, Associate Justice Thurgood Marshall exclaimed, “I do not believe that [University of California at Davis’s] admission program violates the Constitution. For it must be remembered that, during most of the past 200 years, the Constitution as interpreted by this Court did not prohibit the most ingenious and pervasive forms of discrimination against the Negro. Now, when a State acts to remedy the effects of that legacy of discrimination, I cannot believe that this same Constitution stands as a barrier.”⁶ Faith T. Fitzgerald, MD, in 1981, acknowledged that many (described by Thomas Sowell, PhD, as “intelligentsia on the side of the angels against the forces of evil”¹⁵) believed, “discriminatory practices in the past have so devastated certain populations that ‘reverse discrimination,’ although it may not be legal, is nonetheless just.”²¹

Today, stare decisis established by *Bakke* and subsequent Supreme Court cases necessitates the evaluation of a voluntary racial and ethnic affirmative action program under the 2 prongs of strict scrutiny.^{6,28–30} It must support a compelling state interest and it must be narrowly tailored to meet that interest. Compelling interests have consisted of achieving student diversity in higher education and addressing past discrimination *by a particular employer* in

employment.^{18,19} To be narrowly tailored, a policy must demonstrate that (1) it is not a quota, (2) preference is not awarded solely for race or ethnicity (applicants are treated as individuals), (3) race and ethnicity neutral efforts have been insufficient, (4) it does not cause undue harm to nonfavored racial and ethnic groups, and (5) there is a logical end.^{6,30} A quota has been defined as a fixed number or “some specified percentage of a particular group merely because of its race or ethnic origin.”^{6,30}

Phase 3 (1990–2009)

The AAMC “Project 3000 by 2000” began in 1990.²⁴ The goal was to enroll 3000 “underrepresented in medicine” students per year in medical schools by the year 2000.³¹ Despite additional “pipeline” efforts, the program failed as year 2000 acceptees consisted of 1168 blacks, 1082 Hispanics, and 126 American Indians.³² Nationally, it was felt that progress had been attained only by lowering admissions standards for objective academic achievements.²²

In 1996, California became the first state to ban racial and ethnic preferences through Proposition 209. This was admonished by Herbert W. Nickens, MD, and Jordan J. Cohen, MD, of the AAMC.³³ They recognized the paradigm shift to the diversity rationale that occurred with *Bakke* but ignored other aspects of the ruling. Continued advocacy for population parity in medical school admissions was expressed as the “commitment to mirror the society it purports to serve.” Tacit acceptance of reverse discrimination was encoded in the statement, “It is in the nature of highly complex societies that citizens share burdens for which they are not personally responsible.”

The voice to protect academically unqualified “underrepresented in medicine” applicants was lost with the death of Nickens in 1999.³⁴ Previously, Nickens and Cohen emphasized that “no one would (or should) argue for admitting a person to medical school who lacked the academic skills... necessary for succeeding in medical school, obtaining licensure, completing graduate medical education, and becoming certified in a specialty.”³³ Without Nickens, Cohen continued to support racial and ethnic preferences, stating, “alternatives to affirmative action are unworkable.”³⁴ Yet he now minimized high attrition rates for academic reasons and high unmatched rates for graduate medical education programs that had been reported for underrepresented minorities, stating, “... the price of pursuing the important goal of narrowing the diversity gap in medicine is to accept that a small portion of the limited capacity available in medical schools will be lost to potentially more qualified applicants. But... the benefits of constructing a balanced class far outweigh the cost.”³⁴

A 2001 study of the University of Maryland School of Medicine detailed “massive” academic preferences at the time of admissions for blacks that translated into downstream difficulty.³⁵ In 1998, first-time US Medical Licensing Examination Step 1 takers had disparate failing rates: 7 of 27 (26%) for blacks; 1 of 5 (20%) for Hispanics; 0 of 33 (0%) for Asians; and 2 of 81 (2%) for whites. This occurred despite “unlimited hours for tutoring and other support which is perceived by the non-minority student as ‘special treatment,’” including Kaplan preparatory courses, for blacks and Hispanics.

In 2003, 2 Supreme Court cases involving affirmative action at the University of Michigan were decided. In *Gratz et al v Bollinger et al*, the College of Literature, Science, and the Arts was ruled to have violated the Equal Protection Clause of non-favored applicants by automatically awarding 20 points to underrepresented minorities.³⁶ Applicants were not assessed as individuals. In contrast, the law school admissions program was deemed permissible in *Grutter v Bollinger et al*. Recruitment of underrepresented minorities was desired, but there was “no number, percentage, or range of numbers or percentages that constitute[d] critical mass.”²⁹ Associate Justice Sandra Day O’Connor delivered the majority opinion in *Grutter* and stated, “We expect that 25 years from now, the use of racial preferences will no longer be necessary to further the interest approved today.”

Because of shifting national demographics, the AAMC had created a new definition of “underrepresented in medicine” in 2003 as “those racial and ethnic populations that are underrepresented in the medical profession relative to their numbers in the general population.”³⁷ It was intended to address “the efforts of persons from racial and ethnic groups not included in the [underrepresented minority] definition who sought access to the benefits thought to be available to those categorized as [underrepresented minorities].” It also accommodated the use of the Hispanic category, which the US Census began using in the 1970s. In the wake of *Grutter*, an AAMC Executive Council memo issued on March 19, 2004, discouraged continued use of this new definition of “underrepresented in medicine,” stating, “in its reference to “underrepresentation,” the new definition may be viewed as encouraging “racial balancing,” which is expressly prohibited.”³⁷ Yet the AAMC persists in using this definition today.³⁸

In 2006, the National Heart, Lung, and Blood Institute began a research education and mentoring program for junior faculty, initially named the Summer Institute Program to Increase Diversity.³⁹ A federally funded program, it nevertheless was and continues to

be explicitly available only to racial and ethnic groups designated as underrepresented.

Phase 4 (2009–2018)

In 2009, the US Department of Education's LCME issued diversity standards MS-8 and IS-16.¹³ This marked a seismic transformation. Previously, racial and ethnic preferences were voluntary; created and implemented at the state or institutional level; limited to the premedical and medical school stages; and, in theory, temporary. Although AAMC initiatives were national, it was limited to advocacy. The distinguishing features of the "diversity" programs are that racial and ethnic preferences are mandatory; created and implemented at the national level; imposed throughout all stages of academic medicine and cardiology; and intended to be permanent.

The rationale for LCME diversity standards, conceived with the Committee on the Accreditation of Canadian Medical Schools during a 2005 retreat, was to transform institutional diversity goals from "should" to "must."⁴⁰ The changes were spurred by continued numerical stagnation of underrepresented minorities and legal challenges to affirmative action. The result was that the LCME could practically, if not legally, overcome constraints by threatening loss of accreditation. This was demonstrated most prominently in the state of Michigan.

In 2006, Michigan passed Proposal 2, which outlawed the use of race and ethnicity in higher education. This was overturned in 2011 by the US Court of Appeals for the Sixth Circuit based on a disparate impact argument. However, in 2014, the Supreme Court overturned that decision and ruled that states may prohibit the consideration of racial preferences in *Schuette, Attorney General of Michigan v Coalition to Defend Affirmative Action, Integration and Immigration Rights and Fight for Equality by Any Means Necessary (Bamn) et al.*⁴¹

In 2015, Wayne State University School of Medicine was warned by Barbara Barzansky, PhD, and Dan Hunt, MD, of the LCME for noncompliance with MS-8 and IS-16.⁴² Following the announcement of continued full accreditation in 2017, it was reported, "the incoming class in 2014 contained only five African-American students and two Hispanic/Latino students... There were no Native American students... This year's new class includes 33 African-American students, 25 Hispanic/Latino students, five Native American students..."⁴³ Given a class of 187 students in 2017, this suggested a quota between >3.7% and 33.7%. A 2017 article that described an LCME experience at the University of Missouri School of Medicine bluntly stated, "Missouri must now recruit more black, Hispanic, and Native American students by 2018."⁴⁴

Similarities between LCME actions and diversity initiatives for law schools should raise concerns. At George Mason University Law School, racial preferences were gradually phased out between 1996 and 2000.⁴⁵ In 2000, the American Bar Association issued a warning for failure to comply with Standard 211, a diversity provision, thereby risking loss of accreditation. As reported, there was a "lack of progress in achieving student diversity. The number of minority students, especially African-American, Hispanic, and Native American students, continue[d] to be extremely low." The school was ultimately forced to reinstate racial preferences until black matriculants were "more than 13 times as likely to be dismissed for academic cause, and almost twice as likely to fail the bar exam on their first attempt" when compared with students who did not receive preferences. After receiving reaccreditation, Dean Daniel Polsby stated, "What did become quite clear to us during the ordeal was that our efforts to attract minority students would never satisfy the Committee until they produced some unspecified increase in minority enrollment, especially of certain groups. But we were never told how many students of which races and ethnicities we had to enroll to satisfy the [American Bar Association]... this process was unfair to us, as well as to some of the students whom we were pressured to admit, and who later failed out of the law school at great cost to them in terms of time, money, and emotional distress."

The demarcation between student and employee in medical training was unclear until the 2011 Supreme Court decision for *Mayo Foundation for Medical Education et al v United States*.⁴⁶ Residents and fellows were firmly established to be employees (Figure 1). Diversity of a workforce is not a constitutionally permissible justification for voluntary racial and ethnic preferences for employee hiring and promotion.¹⁹

Alex J. Auseon, DO, and colleagues at The Ohio State University, in 2013, detailed efforts to augment diversity in their cardiology fellowship training program.⁴⁷ Outreach efforts to specifically increase the number of underrepresented minorities were exemplary of affirmative action for employment suggested by Executive Order 11246. However, it was also revealed that "... we simply made it a priority to rank [underrepresented in medicine] applicants more aggressively than in previous years, thus achieving success in matching them regardless of recruiting efforts, with the implication being that we accepted less competitive applicants in an effort to increase diversity." Encouraging the explicit use of race and ethnicity for employment reveals a lack of knowledge regarding legal permissibility and fellow status.

In 2016, the Supreme Court allowed for the continued use of racial and ethnic preferences in higher education in their ruling for *Fisher v University of Texas at Austin*, only because it was deemed “a factor of a factor of a factor.”³⁰ By now, however, these policies often benefitted the wealthy. In fact, the university argued that “the race-based component of its admissions plan is needed to admit “[t]he African-American and Hispanic child of successful professionals in Dallas.”

In *The New England Journal of Medicine*, racial and ethnic preferences continued to find support in editorials that preceded the *Fisher* decision. In 2013, authors that included then Editor-in-Chief Jeffrey M. Drazen, MD, continued advocacy for population parity by stating, “Future generation of physicians need to mirror the society they serve.”⁴⁸ In 2014, John K. Iglehart asserted that, despite 5 decades of affirmative action, “There is indisputable evidence that we are not intervening effectively enough to increase the talent pool of African Americans interested in becoming health professionals.”⁸

Phase 5 (2018–Present)

Mandated intervention via racial and ethnic preferences within graduate medical education training programs has become the defining characteristic of this period. To avoid the stigmatization of affirmative action, Nickens and Cohen had insisted in 1996 that “... once [in medical school], minority students must succeed or fail academically as must any student.”³³ For cardiovascular disease training programs, this belief template changed in 2018.

The ACC created their Diversity and Inclusion Task Force in 2017.⁴⁹ A major objective was to address underrepresentation of black and Hispanic cardiologists. Released in 2018, the ACC Diversity and Inclusion Initiative was “limited to race/ethnicity and gender imbalance of physicians” despite acknowledgement that “diversity will ultimately need to be defined more broadly.”¹¹ A two-tiered affirmative action program, it is intended “to increase underrepresented cardiovascular providers in the profession (at every level of training and practice) and in the ACC” throughout “cardiovascular medicine in general, and the ACC in particular” with the goal of population parity.

In March 2019, the ACGME named William A. McDade, MD, PhD, as their first Chief Diversity and Inclusion Officer. The 2019 ACGME Common Program Requirements introduced an undefined resident and faculty “workforce diversity” directive.¹² This allows ACGME to issue warnings to training programs that threaten accreditation. In a 2011 lecture titled, “The Changing Face of Medicine: Diversity at the Pritzker School of Medicine,”

McDade supported the paradigm that considers blacks, Hispanics, and Americans Indians to be underrepresented and the population parity goal.⁵⁰

In 2019, Efrain Talamantes, MD, and colleagues proposed methods to circumvent prohibition of race and ethnicity conscious preferences to yield desired results, described as “equity of opportunity.”⁵¹ They stated, “... medical schools can redesign their admissions criteria and processes and commit to educating classes of students that more closely mirror the U.S. population.” These suggestions are in direct opposition to Cohen who, in 2003, criticized “surrogate markers of diversity,” warning, “These alternatives could be characterized as patently transparent contortions intended to achieve the same outcome... legal challenges to their use for this purpose are inevitable.”³⁴

Affirmative action in higher education continues to be contested. In April 2019, Texas Tech University Health Sciences Center School of Medicine agreed with the US Department of Education Office of Civil Rights to stop using race as a factor in admissions.⁵² This resolved a complaint originally filed in 2004 by the Center for Equal Opportunity. Officials recommended race-neutral alternatives. These included additional considerations for students who are first-generation immigrants, from low-income areas, or bilingual.

In October 2019, Judge Allison Burroughs of the US District Court for Massachusetts ruled that racial and ethnic preferences were permissible in *Students for Fair Admissions, Inc. v President and Fellows of Harvard College (Harvard Corporation)*.⁵³ The lawsuit charged that race was explicitly used to systematically limit the number of Asian matriculants. Prior Supreme Court cases involving affirmative action in higher education had been filed on behalf of white plaintiffs. Legal experts anticipate this case to be eventually appealed to the Supreme Court.

DIVERSITY, INCLUSION, AND EQUITY

For 50 years, the same general concepts have outlined perspectives toward racial and ethnic groups within the physician workforce.¹ First, the groups in need of support are those where the proportion in medical schools or the physician workforce are lower than the proportion in the general population. Second, the goal is population parity. The limitations of maintaining this framework and alternative perspectives are presented in this section.

Diversity

Racial and ethnic diversity has been primarily distilled to increasing the numbers of blacks and Hispanics, as other groups are small in number.⁵⁴ This is supported in the ACC Diversity and Inclusion Initiative, reported

actions of the LCME, and the recorded views of ACGME Diversity and Inclusion Chair McDade.^{11,43,44,50} This viewpoint has translated into claims that there is lack of diversity in medicine and cardiology. Yet it is not lack of nonwhite groups but rather relatively low numbers of blacks and Hispanics (Figure 2).⁵⁵ Although other subgroups exist, the burden of proof is placed upon individuals to prove that they are underrepresented and therefore deserving of preferential treatment (Table 1).^{11,38,56,57}

Asians have never been recognized by the AAMC as deserving any special consideration as they were already “represented,” if not “overrepresented,” since 1969.¹ Yet Asians have not only been subject to historical discrimination in education⁴ but are also held to higher academic standards for medical school admissions.⁵⁵ The ACC used a 3-group model consisting of blacks, Hispanics, and a combined white/Asian group.⁴⁹ ACC Diversity and Inclusion Task Force member, Quinn Capers IV, MD, was quoted as saying, “In 2014, just 2.7% of American cardiologists were black. ... Hispanic doctors made up 5% of the physician pool that year, while the remaining majority fell into another category: white.”⁶⁰ In 2014, Iglehart asserted that “the ‘overwhelming majority’ of medical school graduates continue to be white.”⁸ These assertions are factually incorrect, perpetuate

“deminoritization” of Asians and obscures the fact that Asians would be the group most negatively affected by racial and ethnic balancing.^{55,61} Demographic balancing necessitates affirmative action for underrepresented groups and negative action for “overrepresented” groups.

The current model for racial and ethnic diversity is practically untenable, if not simply for the inevitability of what has been called the “demographic tsunami.”⁸ The United States is no longer composed of virtually all whites and blacks. Because of the Immigration and Nationality Act of 1965, which abolished the National Origins Formula, nonwhite racial and ethnic groups are projected to become more than half of the population by 2050.⁷ Interracial marriages add further uncertainties given multiracial offspring.

Fracturing of the model has already begun. In 2018, Reginald Baugh, MD, argued that recent African immigrants and Afro Caribbeans should be *excluded* from the African American group, stating, “Just because a medical school applicant immigrated to the United States does not make her or him an underrepresented minority in medicine or an African American. The failure to recognize these differences lead to unwarranted conclusions about the future number and availability of African American physicians.”⁶² From *Grutter*, it was revealed that

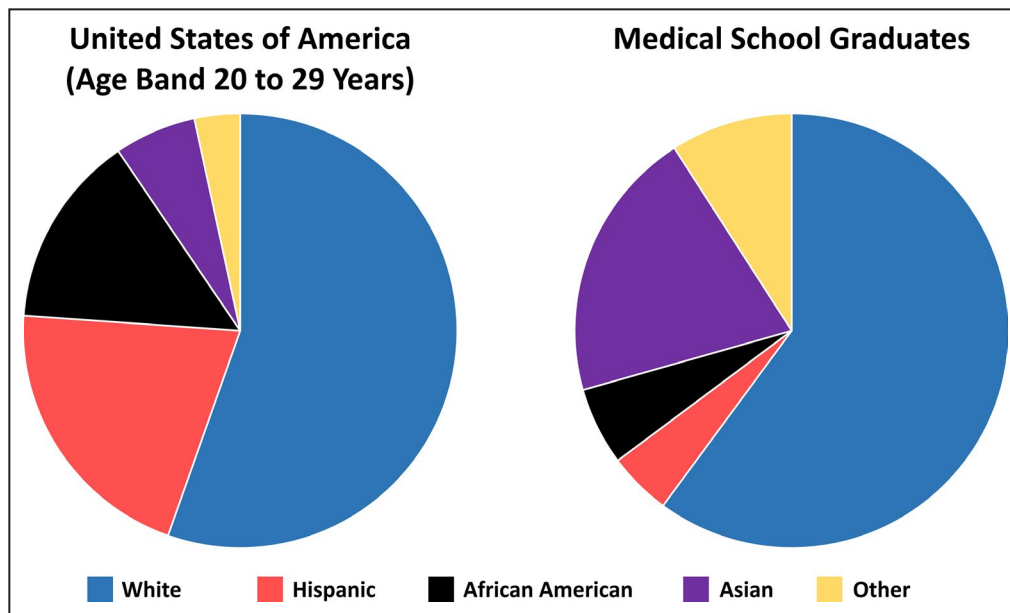


Figure 2. Racial and ethnic composition of the United States population in 2015 (age band, 20–29 years) and medical school graduates for the 2014–2015 class.

US population (age band, 20–29 years) composition for 2015 from census data⁵⁸: white, 55.4%; Hispanic, 20.7%; African American, 14.4%; Asian, 6.1%; and other, 3.4%. US medical school graduates for the 2014–2015 class from Association of American Medical Colleges (AAMC) data⁵⁹: white, 60.1%; Hispanic 4.7%; African American 5.8%; Asian 20.3%; and other, 9.1%. Non-US citizens were excluded. There were small numbers of American Indian or Alaskan Native (n=21, 0.1%) and Native Hawaiians or Pacific Islander (n=6, 0.0%) medical school graduates. These groups were combined with the Other category in both pie charts.

Table 1. Definition of Underrepresented Racial and Ethnic Minorities by Organization

Organization	Definition
AAMC ³⁸	Underrepresented in medicine: “Underrepresented in medicine means those racial and ethnic populations that are underrepresented in the medical profession relative to their numbers in the general population.”
ACC ¹¹	Underrepresented cardiovascular provider: “A significantly lower proportion of members and/or leaders, relative to the U.S. population and/or relative to the available source population (including parent specialty/residency program).”
ACGME ¹²	Undefined
AHA ⁵⁶	NIH definition
NIH ⁵⁷	Populations underrepresented in the extramural scientific workforce: “Individuals from racial and ethnic groups that have been shown by the National Science Foundation to be underrepresented in health-related sciences on a national basis... The following racial and ethnic groups have been shown to be underrepresented in biomedical research: Blacks or African Americans, Hispanics or Latinos, American Indians or Alaska Natives, Native Hawaiians, and other Pacific Islanders.”

AAMC indicates Association of American Medical Colleges; ACC, American College of Cardiology; ACGME, Accreditation Council for Graduate Medical Education; AHA, American Heart Association; and NIH, National Institutes of Health.

a University of Michigan professor argued that Cubans should not receive preferential admissions as Hispanics because “Cubans were Republicans.”²⁹ Further subdivision of Asians has also been suggested by ACC Diversity and Inclusion Task Force members.⁹ Those with origins from the Middle East or North Africa (MENA) continue to be classified as white by the United States Census Bureau and the American medical academy.

Inclusion

Inclusion is not well defined, but generally a method to identify groups for preferences and advocacy. In 1970, the AAMC created a “representation factor” defined as “the percentage of U.S. medical school graduating class composed of a population group divided by the representation of that group in the relevant age band of the population” where the relevant population was typically “the age band of 20 to 29 [years].”¹¹ It was AAMC policy to advocate for a representation factor of 1.0.

Similarly, a 2019 study defined a “representation quotient” as “the ratio of proportion of a particular subgroup among the total population of applicants or matriculants relative to the corresponding estimated proportion of that subgroup in the US population.”⁵⁴ Investigators continued to advocate for population parity, stating, “we have an evidence-based

imperative to find more effective policies to promote representation.”

Limitations, rarely acknowledged, exist for the term *underrepresented* and the population parity model. First, they do not consider differences in applicant rates by group. Using data from the AAMC and the US Census, marked differences for applicants per 100 000 people in the 20- to 29-year age band exist between racial and ethnic groups: 105.4 for whites, 62.9 for blacks, 46.6 for Hispanics, and 373.4 for Asians.^{58,59} Second, blacks and Hispanics have greater unadjusted odds for medical school acceptance when compared with whites and Asians when considering applicants with total Medical College Admission Test (MCAT) scores of ≥21 (Table 2) (a total MCAT score of 21 was the 27th percentile for exams administered between January 2012 and September 2014⁶³). Third, they do not account for differences in academic qualifications. Fourth, targeting population parity of medical school graduates would necessitate “overrepresentation” of black and Hispanic acceptees, given higher attrition rates.

In Table 3, 4 models of the representation factor are presented. Model 1 is the original AAMC definition. Blacks and Hispanics are underrepresented, while whites and Asians are “overrepresented.” Model 2 substitutes medical school acceptees for graduates. There is some convergence to 1.0, although African Americans and Hispanics remain underrepresented. This is likely at least partially due to markedly higher

Table 2. Odds Ratios for Medical School Acceptance by Race and Ethnicity for 2013–2014 Through 2015–2016 for Applicants With Total MCAT Scores ≥21 (Aggregated)

Reference	African American		Hispanic		White		Asian	
	OR (95% CI)	P Value	OR (95% CI)	P Value	OR (95% CI)	P Value	OR (95% CI)	P Value
African American	...		0.99 (0.93–1.04)	0.61	0.79 (0.76–0.83)	<0.0001	0.71 (0.68–0.75)	<0.0001
Hispanic	1.02 (0.96–1.08)	0.61	...		0.80 (0.77–0.84)	<0.0001	0.72 (0.69–0.76)	<0.0001
White	1.26 (1.21–1.32)	<0.0001	1.24 (1.19–1.30)	<0.0001	...		0.90 (0.88–0.93)	<0.0001
Asian	1.40 (1.33–1.47)	<0.0001	1.38 (1.32–1.44)	<0.0001	1.11 (1.08–1.14)	<0.0001	...	

Data from Association of American Medical Colleges (AAMC).⁵⁹ MCAT indicates Medical College Admission Test; and OR, odds ratio.

Downloaded from http://ahajournals.org by on March 25, 2020

Table 3. Representation Factors by Racial and Ethnic Group for US Medical Schools

	Representation		Reference		Representation Factor
	n	%	n	%	
Model 1: AAMC definition					
2014–2015 graduates referenced to US population age band 20–29 y in 2015					
TOTAL	16 676	...	43 657 146	...	
White	11 033	66.16	25 057 074	57.40	1.15
Hispanic	864	5.18	9 344 590	21.40	0.24
African American	1062	6.37	6 512 782	14.92	0.43
Asian	3717	22.29	2 742 700	6.28	3.55
Model 2: Modified AAMC definition					
2013–2016 acceptees referenced to US population age band 20–29 y in 2015					
TOTAL	58 985	...	43 657 146	...	
White	35 789	60.67	25 057 074	57.40	1.06
Hispanic	5782	9.80	9 344 590	21.40	0.46
African American	4446	7.54	6 512 782	14.92	0.51
Asian	12 968	21.99	2 742 700	6.28	3.50
Model 3: Lenient academically qualified definition					
2013–2016 acceptees referenced to 2013–2016 applicants with total MCAT scores ≥ 24					
TOTAL	58 985	...	111 269	...	
White	35 789	60.67	70 142	63.04	0.96
Hispanic	5782	9.80	8487	7.63	1.29
African American	4446	7.54	5680	5.10	1.48
Asian	12 968	21.99	26 960	24.23	0.91
Model 4: Strict academically qualified definition					
2013–2016 acceptees referenced to 2013–2016 applicants with total MCAT scores ≥ 27					
TOTAL	58 985	...	90 995	...	
White	35 789	60.67	58 665	64.47	0.94
Hispanic	5782	9.80	5938	6.53	1.50
African American	4446	7.54	3225	3.54	2.13
Asian	12 968	21.99	23 167	25.46	0.86

Racial and ethnic groups not included in the 4-group model are not displayed. Data from AAMC and United States Census.^{58,59} AAMC indicates Association of American Medical Colleges; and MCAT, Medical College Admission Test.

odds of attrition for academic reasons for underrepresented minorities (Table 4).

The MCAT has been shown to correlate with unimpeded progress through medical school with a “dose-response.”⁶⁵ Kaplan, an MCAT preparatory center, indicates the 50th and 75th percentiles as less competitive and competitive scores, respectively, to receive acceptance.⁶⁶ The Princeton Review recommends a score at or above the 80th percentile for medical school applicants.⁶⁷ National data between 1993–1994 and 2000–2001 demonstrated that the mean \pm standard deviation composite MCAT score for individuals who initially failed the US Medical Licensing Examination Step 1 was 24.0 \pm 4.7.⁶⁸

If MCAT cutoffs of 24 (43rd percentile⁶³) and 27 (61st percentile⁶³) are used to create lenient and strict, respectively, academically qualified definitions of the representation factor, a reversal emerges (Table 3).

Blacks and Hispanics are overrepresented and whites and Asians are underrepresented in the lenient model. This is attributable to substantial numbers of Hispanics and blacks in the ≤ 23 group (Figure 3). The effect is accentuated further in the strict model.

Considering the qualified applicant pool has added importance because of concerns that implicit bias, or subconscious racial or ethnic discrimination, contributes to the low numbers of blacks and Hispanics.⁶⁹ National data refute this hypothesis, given medical school acceptance rates for racial and ethnic groups when MCAT scores are considered.⁵⁵ More refined analyses of institutional data, such as the 2001 University of Maryland report,³⁵ provide indisputable evidence that medical schools are going to great lengths to recruit and support blacks and Hispanics. The qualified applicant pool is simply too small.

Table 4. Attrition Attributable to Academic Reasons 10 Years After Entering US Medical Schools, by Race and Ethnicity

	Matriculants (n)	Attrition (n)	Continuation (n)	OR	95% CI	P Value
Matriculating class 1987						
White	11 554	106	11 448		Reference	
African American	916	66	850	8.39	6.11–11.49	<0.0001
Hispanic	811	28	783	3.86	2.53–5.89	<0.0001
Asian	1696	19	1677	1.22	0.75–2.00	0.42
AIAN	58	2	56	3.86	0.93–16.01	0.06
Matriculating class 1991						
White	10 655	77	10 578		Reference	
African American	1059	66	993	9.13	6.53–12.77	<0.0001
Hispanic	959	22	937	3.23	2.00–5.20	<0.0001
Asian	2382	19	2363	1.10	0.67–1.83	0.70
AIAN	113	7	106	9.07	4.09–20.13	<0.0001
Matriculating class 1995						
White	10 303	70	10 233		Reference	
African American	1231	83	1148	10.57	7.65–14.61	<0.0001
Hispanic	1093	37	1056	5.12	3.42–7.67	<0.0001
Asian	2887	27	2860	1.38	0.88–2.16	0.16
AIAN	139	6	133	6.59	2.82–15.44	<0.0001

Data from Association of American Medical Colleges (AAMC).⁶⁴ AIAN indicates American Indian or Alaskan Native; and OR, odds ratio.

Differences for MCAT scores by racial and ethnic groups have been long been observed, even when accounting for parental income.³⁴ Racial and ethnic bias has been investigated, but its existence has not been supported.⁷⁰ Whites and Asians with low scores may not apply or may retake the test to

achieve higher scores given knowledge of differing acceptance rates by race and ethnicity. A free on-line calculator from The Student Doctor Network to estimate medical school acceptance rates requests only 3 variables: MCAT score, grade point average, and race.⁷¹

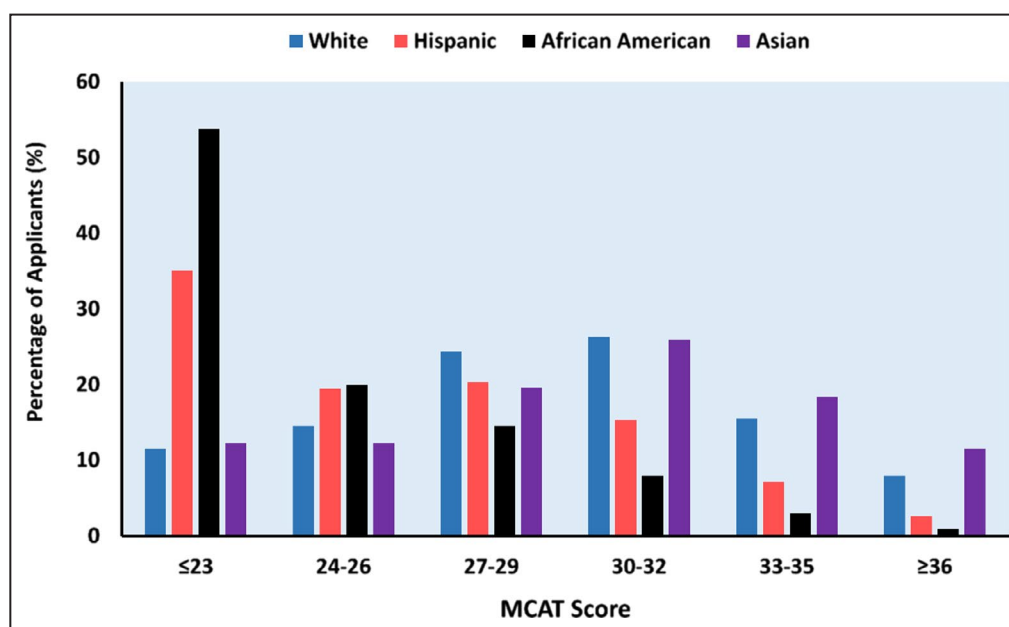


Figure 3. Distribution of medical school applicants by total Medical College Admission Test (MCAT) score group and by race and ethnicity.

All racial and ethnic groups individually total 100%. Data from Association of American Medical Colleges (AAMC), years 2013–2014 through 2015–2016 (aggregated).⁵⁹

Equity

Since 1969, equity has been synonymous with population parity, or proportional representation, in the absence of consideration of the qualified applicant pool.¹ This viewpoint, and the need for racial and ethnic preferences, was expressed in 2003 by Cohen.³⁴ He stated, “until such time that students from all racial and ethnic backgrounds emerge from the educational pipeline with an equivalent range of academic credentials, there is simply no way for medical schools to fully meet their societal obligation without using race and ethnicity as explicit factors in admissions decisions.”

Overt use of race or ethnicity has, however, always been deemed unconstitutional by the Supreme Court since *Bakke*.⁶ Powell stated, “Preferring members of any one group for no reason other than race or ethnic origin is discrimination for its own sake. This the Constitution forbids.” As repeatedly ruled by the Supreme Court, “[r]acial balancing is not transformed from “patently unconstitutional” to a compelling state interest simply by relabeling it “racial diversity.”³⁰ Yet diversity officials, such as Dowin H. Boatright, MD, of Yale School of Medicine’s Diversity Committee, have calculated target numbers for medical school composition by race and ethnicity using the population parity model.⁷²

Professional organizations, even if not federally funded, must be cautious. For example, the ACC is a labor organization and bound by the Civil Rights Act of 1964. It is unlawful to classify its membership in any way that may cause an employer to discriminate against an individual on the basis of race or ethnicity. A fundamental flaw of the ACC Diversity and Inclusion Initiative is promotion of racial and ethnic balancing by fiat.¹¹ It is, by definition, a quota.

THE DIVERSITY RATIONALE IN CARDIOVASCULAR DISEASE

Affirmative action via voluntary racial and ethnic preferences has long required a compelling state interest to meet the first prong of strict scrutiny.^{18,19} Recent diversity programs have promoted their justification as increasing healthcare access for underserved populations, reducing healthcare disparities between groups, and improving business.¹¹ This section addresses the first 2, as business performance has never been offered or recognized as a legal rationale for racial and ethnic preferences in higher education or employment.^{18,19} The other rationales have been supported by the ACC and McDade of the ACGME.

Healthcare disparities have been well documented for African Americans, Hispanics, Asians, and American Indians, or Alaskan Natives.^{73–76} In a

video for *Creating Pathways and Access for Student Success*, McDade claimed that increasing diversity, or underrepresented minority physicians, is “probably the number one way that you can actually address health care disparities” solely on the basis of his assertion that “minority students will tell you disproportionately that they’re going to serve underserved and minority populations.”⁷⁷

Do “Underrepresented in Medicine” Physicians Lead to Greater Access for Underserved Populations?

Access to primary care physicians, who manage cardiovascular risk factors, and cardiologists are vital public health considerations. “Underserved” geographic areas have consistently been shown to have higher proportions of black and Hispanic physicians.^{78–80} Individuals designated by the AAMC as minorities have historically been noted to express a high desire to practice in underserved, socioeconomically deprived communities.¹ However, while a study on the early effects of affirmative action for the graduating class of 1975 demonstrated that minorities were more likely to be practicing primary care in underserved areas, they were also far less likely to be board certified by 1984 when compared with nonminorities (48% versus 80%; $P < 0.001$).⁷⁸

A 1994 paper published in the *Journal of the National Medical Association*, whose purpose is “to address medical care disparities of persons of African descent,” raised the question of whether AAMC-designated minorities selected primary care “by default rather than by desire.”⁸¹ Blacks were significantly less likely than whites and Asians to be continuing their specialties of choice by their third postgraduate years, as indicated on their Medical School Graduation Questionnaires. More blacks compared with whites (18.6% versus 10.9%) were not in graduate medical programs. The authors concluded, “it is assumed that the majority of them entered some form of clinical practice” and “entered the broad field of primary care.” They speculated that working in an underserved area may be attributable to inability to secure a job in other areas because of low professional qualifications.

This hypothesis was supported by a 1995 California study that demonstrated primary care physicians who were not board certified were 1.6 times more likely to work in rural underserved areas when compared with board-certified counterparts.⁸² In a 2004 survey study of Medicare beneficiaries in 2000–2001, office visits by black patients were less likely to be managed by board-certified physicians than white patients (77.4% versus 86.1%; $P = 0.02$).⁸⁰ Primary care physicians who cared for black patients were also more likely to report inability to deliver high-quality services when compared with those who cared for white patients.

Little is known about “underrepresented in medicine” cardiologists and their preferred practice settings. For cardiology procedures, studies have consistently shown better outcomes at high-volume centers for implantable cardioverter-defibrillators, catheter ablation of atrial fibrillation, percutaneous coronary intervention, and coronary artery bypass surgery.^{83–86} The mainstays to address access issues are 2-fold. First, primary care physicians must recognize patients who may benefit from cardiology consultation and evidence-based procedures. Second, access to high-quality cardiology services must be available. Outreach clinics and telemedicine are potential solutions.^{87,88}

It should be noted that increasing physicians in underserved areas was specifically raised as a rationale for affirmative action in *Bakke*.⁶ This was not deemed constitutionally permissible by Powell, who stated, “But there is virtually no evidence in the record indicating that petitioner’s special admissions program is either needed or geared to promote that goal.” This lack of evidence continues today.

Does Diversity Save Lives?

A non-peer-reviewed paper⁸⁹ has recently been cited in high-profile journals as evidence that patient and physician racial and ethnic concordance “could reduce the gap in cardiovascular mortality between black men and white men in the United States by 19% and the gap in life expectancy by approximately 8%.”^{51,90} Yet residual confounding in patient-physician racial and ethnic concordance studies is impossible to eliminate as physicians of the same race and ethnicity are not interchangeable. The results have little external validity as the study only involved 14 physicians (8 nonblack and 6 black).⁸⁹ Moreover, mortality estimates were extrapolated from single patient-physician encounters using methods so unscientific that the investigators themselves described them as “back-of-the-envelope calculations.”

There exists no empirical evidence by accepted standards for causal inference to support the mantra that “diversity saves lives.”⁶⁰ Patients may feel more engaged with physicians of the same race and ethnicity.⁹¹ A recent systematic review demonstrated that better communication was present on several metrics, but not quality, when patient and physician racial and ethnic concordance was present.⁹² However, these studies need to be interpreted cautiously as they encourage the reduction of complex individuals to little more than their races and ethnicities. In addition, one study even demonstrated that Hispanic men were *less* satisfied on certain aspects of their medical care when interacting with Hispanic healthcare providers.⁹³

Healthcare disparities may be due to clustering of biological risk factors for disease and socioeconomic

conditions, rather than race and ethnicity per se. Recently, Clyde Yancy, MD, and Ajay Kirtane, MD, commented on a study where race and ethnicity was no longer associated with differences in outcomes after accounting for social determinants of health.⁹⁴ They concluded, “What was heretofore attributable to inexplicable race/ethnicity-based differences may now be more clearly associated with both biological and social constructs, perhaps independent of race/ethnicity.”

MISMATCH

Continuation of racial and ethnic preferences for 5 decades results from the small pool of qualified black and Hispanic medical school applicants. The addition of LCME diversity standards for medical schools over the past decade has been associated with little progress.^{9,54} ACC and ACGME diversity programs focus mostly downstream of medical school admissions, where the available talent pool has already been established.^{11,12} Therefore, efforts applied to cardiovascular disease training programs at the trainee and faculty levels are unlikely to be successful. Any successful intervention must increase the qualified medical school applicant pool. All potential causative factors to so-called leaks in the pipeline should be considered. An evolving theory for low numbers of blacks and Hispanics in Science, Technology, Engineering, and Math (STEM) and professional fields revolves around the paradoxically harmful effects of affirmative action known as mismatch.^{45,95}

Racial and ethnic preferences at both the undergraduate and professional school levels for blacks and Hispanics result in relatively weak academic starting positions in classes. This has been postulated to lead to poor performance through compounding “academic mismatch,” stress-related interference, and disengagement.⁹⁵ Many do not complete their intended programs or do not attain academic success to be attractive candidates for subsequent educational programs or employment.

Stress-related interference may be a direct consequence of preferential admissions. As entering academic credentials are generally lower (Figure 4), the diversity rationale argues that at least some individuals from “underrepresented in medicine” groups are admitted, at least in part, to enhance cultural competence.⁶ This may contribute to perceptions of adverse social environments and lack of social support.⁹⁶ Pressures to serve as “ambassadors” for their race or ethnicity become ironic given the diversity rationale.⁹⁷

Another result of racial and ethnic preferences is the “cascade effect.”¹⁴⁵ As top-tier schools admit blacks

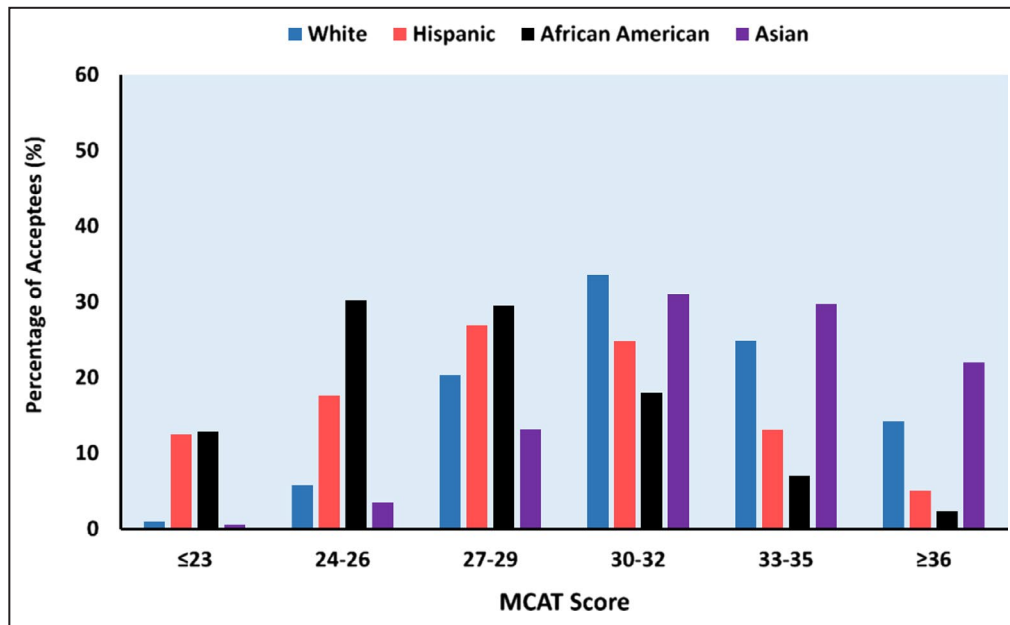


Figure 4. Distribution of medical school acceptees by total Medical College Admission Test (MCAT) score group and by race and ethnicity.

All racial and ethnic groups individually total 100%. Data from Association of American Medical Colleges (AAMC), years 2013–2014 through 2015–2016 (aggregated).⁵⁹

and Hispanics with lower academic credentials, lower-tier schools are forced to do the same if they hope to reach a “critical mass” of individuals from underrepresented groups. Students who may not be academically qualified for medical school at all may be admitted, particularly to less competitive medical schools.

A study performed at Duke University of undergraduate students who matriculated in 2001 and 2002 supported mismatch.⁹⁸ Black men and women demonstrated marked differences between initially choosing majors in economics, engineering, or natural sciences and graduating with them, with absolute percentage point decreases of 41.7% (76.7% versus 35.0%) and 28.3% (56.0% versus 27.7%), respectively. In contrast, absolute percentage point decreases were 5.1% (68.7% versus 63.6%) and 16.6% (51.0% versus 34.4%) for white men and women, respectively. An important factor was academic preparedness, as whites had Scholastic Aptitude Test scores that were >1 standard deviation higher than black. The relevance to the medical profession should not be overlooked as some of these individuals, who may have had an interest in medicine, may have achieved greater academic success at better-matched universities. Their aspirations may have been paradoxically harmed by affirmative action.

Further data supporting the possibility that affirmative action for underrepresented minorities may cause leaks in the academic pipeline is suggested by the aftermath of the elimination of racial and

ethnic preferences in California after the passage of Proposition 209. Although the overall number of underrepresented minorities in the University of California system decreased, the overall number of underrepresented minority graduates increased.⁹⁹ Moreover, an analysis considering reallocation of underrepresented minorities to minimize mismatch resulted in substantial increases in Science, Technology, Engineering, and Math degree graduates.¹⁰⁰

Proposition 209 resulted in a “triple win” for underrepresented minorities, as evidenced by (1) elimination or minimization of academic mismatch that yielded improved performance; (2) increased interest in the University of California system by out-of-state black and Hispanic applicants; and (3) increased yield rates, or accepted offers, by black and Hispanic acceptees.⁴⁵ It was hypothesized that a race-neutral admissions policy increased interest in the universities by underrepresented minorities, as it eliminated the stigma of affirmative action. Despite these apparent benefits, Sander and Taylor stated, “top [University of California] administrators were virtually unanimous in viewing the post-209 landscape with disgust.” Soon, changes in admissions policies created de facto racial and ethnic preferences.

Data indicating harm for recipients of preferential medical school admissions have long been reported. Yet these have largely been ignored or minimized. In 2007, the AAMC reported markedly higher medical school attrition rates for academic reasons for blacks,

Hispanics, and American Indians when compared with whites and Asians for the matriculating classes of 1987, 1992, and 1995 (Table 4).⁶⁴ The conclusion, however, simply stated that “medical students exhibit a relatively high rate of graduation and a low rate of attrition due to academic reasons.” In 2003, Cohen had reached a similar conclusion regarding the matriculating class of 1990, stating, “Only 7.5% [of underrepresented minority students] withdrew or were dismissed for academic reasons.”³⁴

Most medical schools now require students to pass the US Medical Licensing Examination Step 1 to advance.⁶⁸ Introduced in 1992, poor performance of blacks and Hispanics on the US Medical Licensing Examination Step 1 was described as early as 1996.¹⁰¹ First-try passing rates for the graduating class of 1994 were 93.4% for whites, 58.2% for blacks, 77.5% for Hispanics, and 86.8% for Asians. In fact, 11.8% of blacks had not passed both Steps 1 and 2 by May 1996. These trends likely persist given results reported in a recent study.⁶⁸

Even underrepresented individuals who were positioned to graduate have been noted to have higher rates of going unmatched for graduate medical education positions, as reported in 1990 by the National Resident Matching Program.¹ Unmatched rates were 6.8% for majority men, 16.6% for black men, and 11.4% for Hispanic men. Similarly, they were 4.5% for majority women, 14.0% for black women, and 10.0% for Hispanic women. Given efforts to recruit them into medical schools, it is unlikely that residency programs would not be equally enthusiastic, provided they performed well academically.

A recent call to eliminate MCAT scores from the medical school admissions process to facilitate acceptance of “underrepresented” minorities by Inginia Genao, MD, and Jacob Gelman, JD, failed to acknowledge that standardized tests are present at all stages of credentialing in the medical profession.¹⁰² Accepting lower MCAT scores for certain groups, which already occurs, will naturally lead to recommendations to decrease other downstream objective expectations for those groups, which has happened.¹⁰³ Moreover, the disparate impact framework that was argued by Genao and Gelman did not consider that “underrepresented” minorities are already given considerable leniency when compared with other groups (Figure 4).^{55,102}

Holistic review for medical school admissions de-emphasizes objective measures of academic capabilities.¹⁰⁴ There has long been acknowledgement that standardized test scores do not necessarily translate into clinical competence.²⁶ However, holistic review may harm underrepresented minorities if accreditation organizations and medical schools ignore the ability of the MCAT to predict minimum academic preparedness.

It should also not be used to promote racial and ethnic balancing, as has been suggested.⁵¹

Fitzgerald warned that students could become “pawns in a game of social balances.”²¹ Dissenting in *Grutter*, Thomas stated, “The Law School tantalizes unprepared students with the promise of a University of Michigan degree and all of the opportunities that it offers. These overmatched students take the bait, only to find that they cannot succeed in the cauldron of competition. ... And the aestheticists will never address the real problem facing “underrepresented minorities,” instead continuing their social experiments on other people’s children.”²⁹

We should not ignore the possibility that some academically qualified underrepresented minorities may reconsider applying to medical school if they observe academic difficulties in others of their racial or ethnic group already in medical schools. This is particularly concerning for black men.¹⁰⁵ Powell had warned that “preferential programs may only reinforce common stereotypes holding that certain groups are unable to achieve success without special protection based on a factor having no relationship to individual worth.”⁶ High-performing physicians from underrepresented minority groups, who would have succeeded without affirmative action, may also be harmed indefinitely by the unfair perception that they were hired to fulfill a diversity mandate.

CONCLUSIONS

Over the past 5 decades, the American medical academy has striven to achieve racial and ethnic population parity. Recent affirmative action efforts through diversity, inclusion, and equity programs recognize neither changes in legal limitations, nor data indicating harm to underrepresented minorities. Long-term academic solutions and excellence should not be sacrificed for short-term demographic optics.

Prominent individuals from historically discriminated groups have voiced opposition to affirmative action. Arthur Ashe, the tennis champion, stated, “If American society had the strength to do what should have been done to ensure that justice prevails for all, then affirmative action would be exposed for what it is: an insult to the people it is intended to help. What I and others want is an equal chance, under one set of rules, as on a tennis court. To be sure, while rules are different for different people, devices like affirmative action are needed to prevent explosions of anger. Practically, affirmative action is probably necessary. But I would not want to know that I received a job simply because I am black. Affirmative action tends to undermine the spirit of individual initiative. Such is human nature; why

struggle to succeed when you can have something for nothing?”¹⁰⁶

Racial and ethnic preferences for undergraduate and medical school admissions should be gradually rolled back with a target end year of 2028, as suggested by the Supreme Court decision in *Grutter*.²⁹ The ACGME diversity directive must be recognized as an erosion to freedom for cardiovascular disease training programs to select trainees and even faculty. All affirmative action programs must uphold legal boundaries established by the Equal Protection Clause of the Fourteenth Amendment to the Constitution of the United States, the Civil Rights Act of 1964, and Executive Order 11246.

Cardiovascular disease training programs are custodians for some of the \$16 billion per year in federal funding that supports graduate medical education.¹⁰⁷ Therefore, the vast majority should not “discriminate against an individual ... because of such individual’s race, color, ... or nation of origin.”¹⁶ As Fitzgerald envisioned, “We will have succeeded when we no longer think we require black doctors for black patients, chicano doctors for chicano patients, or gay doctors for gay patients, but rather good doctors for all patients.”¹⁰⁸ Evolution to strategies that are neutral to race and ethnicity is essential. Ultimately, all who aspire to a profession in medicine and cardiology must be assessed as individuals on the basis of their personal merits, not their racial and ethnic identities.

ARTICLE INFORMATION

Affiliations

From the Heart and Vascular Institute, University of Pittsburgh Medical Center, Pittsburgh, PA.

Sources of Funding

None.

Disclosures

Dr Wang serves as a consultant for Abbott; serves as a research investigator for Boston Scientific; and receives fellowship support from Abbott, Boston Scientific, and Medtronic.

REFERENCES

- Petersdorf RG, Turner KS, Nickens HW, Ready T. Minorities in medicine: past, present, and future. *Acad Med*. 1990;65:663–670.
- Brown et al v Board of Education of Topeka et al.*, 347 U.S. 483. 1953.
- Arriola C. Knocking on the schoolhouse door: *Mendez v Westminster*, equal protection, public education, and Mexican Americans in the 1940’s. *La Raza Law J*. 1995;8:166–207.
- Kuo J. Excluded, segregated and forgotten: a historical view of the discrimination of Chinese Americans in public schools. *Asian Law J*. 1998;5:181–212.
- Haag AM. The Indian boarding school era and its continuing impact on tribal families and the provision of government services. *Tulsa L Rev*. 2013;43:149–168.
- Regents of the University of California v Bakke*, 438 U.S. 265. 1978.
- Taylor P, Cohn D. A milestone en route to a majority minority nation. Pew Research Center. November 7, 2012. Available at: https://www.pewsocialtrends.org/2012/11/07/a-milestone-en-route-to-a-majority-minority-nation/?src=rss_main. Accessed November 9, 2019.
- Iglehart JK. Diversity dynamics—challenges to a representative U.S. medical workforce. *N Engl J Med*. 2014;371:1471–1474.
- Mehta LS, Fisher K, Rzeszut AK, Lipner R, Mitchell S, Dill M, Acosta D, Oetgen WJ, Douglas PS. Current demographic status of cardiologists in the United States. *JAMA Cardiol*. 2019;4:1029–1033.
- Francis CK, Alpert JS, Clark LT, Ofili EO, Wong RC. Working group 3: how to encourage more minorities to choose a career in cardiology. *J Am Coll Cardiol*. 2004;44:241–245.
- American College of Cardiology Diversity and Inclusion Initiative. Available at: <https://www.acc.org/about-acc/diversity-and-inclusion>. Accessed November 9, 2019.
- Accreditation Council for Graduate Medical Education. ACGME Common Program Requirement (Residency). June 10, 2018. Available at: <https://www.acgme.org/Portals/0/PFAssets/ProgramRequirements/CPRResidency2019.pdf>. Accessed November 9, 2019.
- Liaison Committee on Medical Education. *Liaison Committee on Medical Education (LCME) Standards on Diversity*. Washington, DC: American Association of Medical Colleges; 2009. Available at: <https://health.usf.edu/~media/Files/Medicine/MD%20Program/Diversity/LCMEStandardsonDiversity1.ashx?la=en>. Accessed November 9, 2019.
- The Constitution of the United States. Available at: <https://www.archives.gov/founding-docs>. Accessed November 9, 2019.
- Sowell T. *Intellectuals and Race*. New York: Basic Books; 2013.
- Civil Rights Act of 1964. Available at: <https://www.ourdocuments.gov/doc.php?flash=true&doc=97&page=transcript>. Accessed November 9, 2019.
- U.S. Department of Labor. Office of Federal Contract Compliance Programs. 41 CFR Parts 60-1 an 60-2 Government Contractors, Affirmative Action Requirements Final Rule. November 13, 2000. Available at: https://www.dol.gov/ofccp/regs/compliance/FinalRules_Notices.htm. Accessed November 9, 2019.
- Back CJ, Hsin JS. “Affirmative action” and equal protection in higher education. Congressional Research Service. Updated January 31, 2019. Available at: <https://fas.org/sgp/crs/misc/R45481.pdf>. Accessed November 9, 2019.
- Legislative attorney (name redacted). Affirmative action in employment: a legal overview. Congressional Research Service. January 19, 2010. Available at: https://www.everycrsreport.com/files/20100119_RL30470_a97900afa66ce22fb84b4fcdc6c4ab580d7cdaae.pdf. Accessed November 9, 2019.
- Missouri et al. v Jenkins et al.* 515 U.S. 70. 1995.
- Fitzgerald FT. Three years after *Bakke*: a reaffirmation. *N Engl J Med*. 1981;305:886–887.
- Cohen JJ, Gabriel BA, Terrell C. The case for diversity in the health care workforce: interventions to improve the racial and ethnic diversity of the U.S. medical workforce should begin well before medical school. *Health Aff*. 2002;21:90–102.
- Oppenheimer DB. Dr. King’s dream of affirmative action. *Harv Latinx L Rev*. 2018;21:55–86.
- Nickens HW, Ready TP, Petersdorf RG. Project 3000 by 2000: racial and ethnic diversity in U.S. medical schools. *N Engl J Med*. 1994;331:472–476.
- Sleeth BC, Mishell RI. Black under-representation in United States medical schools. *N Engl J Med*. 1977;297:1146–1148.
- Ramsey FJ. The medical school admissions dilemma: damned if you do, damned if you don’t. *JAMA*. 1977;237:1093–1094.
- Undergraduate medical education. *JAMA*. 1975;234:1333–1351.
- City of Richmond v J. A. Croson Co.*, 488 U.S. 469. 1989.
- Grutter v Bollinger et al.*, 539 U.S. 306, 325. 2003.
- Fisher v University of Texas at Austin et al.*, 579 U.S. ____ 2016.
- Terrell C, Beaudreau J. 3000 by 2000 and beyond: next steps for promoting diversity in the health professions. *J Dental Educ*. 2003;67:1048–1052.
- Kao A. Race, ethnicity, and the patient-physician relationship. *Virtual Mentor*. 2001;3:virtualmentor.2001.3.8. DOI: 10.1111/virtualmentor.2001.3.8.dykn1-0108. Available at: <https://journalofethics.ama-assn.org/article/race-ethnicity-and-patient-physician-relationship/2001-08>. Accessed November 9, 2019.

33. Nickens HW, Cohen JJ. On affirmative action. *JAMA*. 1996;275:572–574.
34. Cohen JJ. The consequences of premature abandonment of affirmative action in medical school admissions. *JAMA*. 2003;289:1143–1149.
35. Lerner R, Nagai AK. Racial and ethnic preferences and consequences at the University of Maryland School of Medicine. Center for Equal Opportunity. Available at: <https://www.ceousa.org/attachments/article/653/MDMED.pdf>. Accessed November 9, 2019.
36. *Gratz et al. v Bollinger et al.* 539 U.S. 244. 2003.
37. Association of American Medical Colleges. The status of the new AAMC definition of “underrepresented in medicine” following the Supreme Court’s decision in *Grutter*. March 19, 2004. Available at: <https://www.aamc.org/download/54278/data/urm.pdf>. Accessed June 1, 2019.
38. Association of American Medical Colleges. Underrepresented in medicine definition. Available at: <https://www.aamc.org/what-we-do/mission-areas/diversity-inclusion/underrepresented-in-medicine>. Accessed November 9, 2019.
39. Boutjdir M, Aromolaran AS, de las Fuentes L, Boyington JEA, Arteaga SS, Jobe J, Jeffe DB, Rao DC, Rice TK, Davila-Roman VG. Research education and mentoring program in cardiovascular diseases for under-represented junior faculty from NHLBI SIPID/PRIDE. *J Am Coll Cardiol*. 2019;73:1861–1865.
40. Casey BR. Implementation of accreditation standards related to medical school diversity. Available at: <https://www.ama-assn.org/sites/ama-assn.org/files/corp/media-browser/public/about-ama/councils/Council%20Reports/council-on-medical-education/a11-cme-accreditation-standards-med-school-diversity.pdf>. Accessed November 9, 2019.
41. *Schuetz, Attorney General of Michigan v Coalition to Defend Affirmative Action, Integration and Immigration Rights and Fight for Equality by Any Means Necessary (Bamn) et al.* 572 U.S. ____ 2014.
42. Barzansky B, Hunt D. LCME adverse action letter. June 15, 2015. Available at: https://www.thesouthend.wayne.edu/pdf_fdaebf68-3be5-11e5-97ed-4377d1e6b74e.html. Accessed November 9, 2019.
43. LCME continues School of Medicine’s full accreditation through 2022–23. October 20, 2017. Available at: <https://today.wayne.edu/medicine/news/2017/10/20/lcme-continues-school-of-medicines-full-accreditation-through-2022-23-29963>. Accessed November 9, 2019.
44. Blau M. Diversify or else: this Missouri medical school’s urgent plan to save its accreditation. *STAT News*. April 26, 2017. Available at: <https://www.statnews.com/2017/04/26/diversify-missouri-medical-school/>. Accessed November 9, 2019.
45. Sander RH, Taylor S Jr. *Mismatch: How Affirmative Action Hurts Students Its Intended to Help, and Why Universities Won’t Admit It*. New York: Basic Books; 2012.
46. *Mayo Foundation for Medical Education and Research et al. v United States.* 562 U.S. ____ 2011.
47. Auseon AJ, Kolibash AJ Jr, Capers Q IV. Successful efforts to increase diversity in a cardiology fellowship training program. *J Grad Med Educ*. 2013;5:481–485.
48. Curfman GD, Morrissey S, Drazen JM. Affirmative action in the balance. *N Engl J Med*. 2013;368:73–74.
49. Douglas PS, Williams KA, Walsh MN. Diversity matters. *J Am Coll Cardiol*. 2017;70:1525–1529.
50. McDade WA. The changing face of medicine: diversity at the Pritzker School of Medicine. June 19, 2014. Available at: <https://www.youtube.com/watch?v=97niFvkC-iU>. Accessed November 9, 2019.
51. Talamantes E, Henderson MC, Fancher TL, Mullan F. Closing the gap—making medical school admissions more equitable. *N Engl J Med*. 2019;380:803–805.
52. Hackman M. U.S. requires Texas Tech med school to end use of race in admissions decisions. *The Wall Street Journal*. April 9, 2019. Available at: <https://www.wsj.com/articles/trump-administration-to-require-texas-tech-to-end-use-of-race-in-admissions-decision-11554829163>. Accessed November 9, 2019.
53. *Students for Fair Admissions, Inc. v President and Fellows of Harvard College (Harvard Corporation)*. Civil Action No. 14-cv-14176-ADB. September 30, 2019. Available at: https://www.courtlistener.com/recap/gov.uscourts.mad.165519/gov.uscourts.mad.165519.672.0_2.pdf. Accessed November 9, 2019.
54. Lett LA, Murdock HM, Orji WU, Aysola J, Sebros R. Trends in racial/ethnic representation among US medical students. *JAMA Netw Open*. 2019;2:e1910490.
55. Wang NC. How do Asians fit into the American College of Cardiology’s Diversity and Inclusion Initiative? *J Am Coll Cardiol*. 2019;74:257–260.
56. American Heart Association. Clinical cardiology minority travel grant. Available at: https://professional.heart.org/professional/MembershipCouncils/ScientificCouncils/UCM_431946_Clinical-Cardiology-Minority-Travel-Grant.jsp. Accessed November 9, 2019.
57. National Institutes of Health. Populations underrepresented in the extramural scientific workforce. Available at: <https://diversity.nih.gov/about-us/population-underrepresented>. Accessed November 9, 2019.
58. United States Census Bureau. American Fact Finder. Annual estimates of the resident population by sex, age, race, and Hispanic origin for the United States and States: April 1, 2010 to July 1, 2015; 2015 population estimates. Available at: <https://factfinder.census.gov/>. Accessed November 9, 2019.
59. Association of American Medical Colleges. Available at: <https://www.aamc.org/>. Accessed May 21, 2019.
60. Slachta A. How med school recruiters can help solve cardiology’s diversity problem. *Cardiovascular Business*. March 19, 2018. Available at: <https://www.cardiovascularbusiness.com/topics/practice-management/how-med-school-recruiters-can-help-solve-cardiologys-diversity-problem>. Accessed November 9, 2019.
61. Lee SS. The de-minorization of Asian Americans: a historical examination of the representation of Asian Americans in affirmative action admissions policies at the University of California. *Asian Am L J*. 2008;15:129–152.
62. Baugh RF. I am an African American: distinguishing between African American and African applicants in medical school admissions matters. *Acad Med*. 2018;93:1281–1285.
63. Association of American Medical Colleges. Percentile ranks for the MCAT exam. Available at: <https://www.aamc.org/services/mcat-admissions-officers/resources/percentile-ranks>. Accessed November 9, 2019.
64. Garrison G, Mikesell C, Matthew D. Medical school graduation and attrition rates. *AAMC Anal Brief*. 2007;7. Available at: <https://www.aamc.org/system/files/reports/1/aibv07no2.pdf>. Accessed November 9, 2019.
65. Dunleavy DM, Kroopnick MH, Dowd KW, Searcy CA, Zhao X. The predictive validity of the MCAT exam in relation to academic performance through medical school: a national cohort study of 2001–2004 matriculants. *Acad Med*. 2013;88:666–671.
66. Kaplan. What’s a good MCAT score? Available at: <https://www.kaptest.com/study/mcat/whats-a-good-mcat-score/>. Accessed November 9, 2019.
67. The Princeton Review. What is a good MCAT score? Available at: <https://www.princetonreview.com/med-school-advice/what-is-a-good-mcat-score>. Accessed November 9, 2019.
68. Andriole DA, Jeffe DB. A national cohort study of U.S. medical school students who initially failed Step 1 of the United States Medical Licensing Examination. *Acad Med*. 2012;87:529–536.
69. Capers Q 4th, Clinchot D, McDougle L, Greenwald AG. Implicit racial bias in medical school admissions. *Acad Med*. 2017;92:365–369.
70. Davis D, Dorsey JK, Franks RD, Sackett PR, Searcy CA, Zhao X. Do racial and ethnic group differences in performance on the MCAT exam reflect test bias? *Acad Med*. 2013;88:593–602.
71. The Student Doctor Network. Your chance of gaining admission to at least one medical school based on official AAMC historical data. Available at: https://schools.studentdoctor.net/lizzym_score. Accessed November 9, 2019.
72. Emery CR, Boatright D, Culbreath K. Stat! An action plan for replacing the broken system of recruitment and retention of underrepresented minorities in medicine. *NAM Perspectives*. Discussion Paper, National Academy of Medicine, Washington, DC. September 10, 2018. DOI: 10.31478/201809a.
73. Carnethon MR, Pu J, Howard G, Albert MA, Anderson CAM, Bertoni AG, Mujahid MS, Palaniappan L, Taylor HA Jr, Willis M, et al. Cardiovascular health in African Americans: a scientific statement from the American Heart Association. *Circulation*. 2017;136:e393–e423.
74. Rodriguez CJ, Allison M, Daviglius ML, Isasi CR, Keller C, Leira EC, Palaniappan L, Piña IL, Ramirez SM, Rodriguez B, et al. Status of cardiovascular disease and stroke in Hispanics/Latinos in the United States: a science advisory from the American Heart Association. *Circulation*. 2014;130:593–625.
75. Palaniappan LP, Araneta MRG, Assimes TL, Barrett-Connor EL, Carnethon MR, Criqui MH, Fung GL, Narayan KMV, Patel H,

- Taylor-Piliae RE, et al. Call to action: cardiovascular disease in Asian Americans: a science advisory from the American Heart Association. *Circulation*. 2010;122:1242–1252.
76. Veazie M, Ayala C, Schieb L, Dai S, Henderson JA, Cho P. Trends and disparities in heart disease mortality among American Indians/Alaska Natives, 1990–2009. *Am J Public Health*. 2014;104:S359–S367.
 77. McDade WA. What is the #1 way to address health disparities? September 21, 2018. Available at: <https://www.youtube.com/watch?v=ylyVOrox9Jk>. Accessed November 9, 2019.
 78. Keith SN, Bell RM, Swanson AG, Williams AP. Effects of affirmative action in medical schools: a study of the class of 1975. *N Engl J Med*. 1985;313:1519–1525.
 79. Komaromy M, Grumbach K, Drake M, Vranizan K, Lurie N, Keane D, Bindman AB. The role of black and Hispanic physicians in providing health care for underserved populations. *N Engl J Med*. 1996;334:1305–1310.
 80. Bach PB, Pham HH, Schrag D, Tate RC, Hargraves JL. Primary care physicians who treat blacks and whites. *N Engl J Med*. 2004;351:575–584.
 81. Babbott D, Weaver SO, Baldwin DC Jr. Primary care by desire or default? Specialty choices of minority graduates of US medical schools in 1983. *J Natl Med Assoc*. 1994;86:509–515.
 82. Burnett WH, Mark DH, Middling JE, Zellner BB. Primary care physicians in underserved areas: family physicians dominary. *West J Med*. 1995;163:532–536.
 83. Freeman JV, Wang Y, Curtis JP, Heidenreich PA, Hlatky MA. Physician procedure volume and complications of cardioverter-defibrillation implantation. *Circulation*. 2012;125:57–64.
 84. Deshmukh A, Patel NJ, Pant S, Shah N, Chothani A, Mehta K, Grover P, Singh V, Vallurupalli S, Savani GT, et al. In-hospital complications associated with catheter ablation of atrial fibrillation in the United States between 2000 and 2010: analysis of 93801 procedures. *Circulation*. 2013;128:2104–2112.
 85. Fanaroff AC, Zakrofsky P, Wojdyla D, Kaltenbach LA, Sherwood MW, Roe MT, Wang TY, Peterson ED, Gurm HS, Cohen MG, et al. Relationship between operator volume and long-term outcomes after percutaneous coronary intervention: report from the NCDR CathPCI Registry. *Circulation*. 2019;139:458–472.
 86. Wu C, Hannan EL, Ryan TJ, Bennett E, Culliford AT, Gold JP, Isom OW, Jones RH, McNeil B, Rose EA, et al. Is the impact of hospital and surgeon volumes on the in-hospital mortality rate for coronary artery bypass graft surgery limited to patients at high risk? *Circulation*. 2004;100:784–789.
 87. Gruca TS, Pyo TH, Nelson GC. Providing cardiology care in rural areas through visiting consultant clinics. *J Am Heart Assoc*. 2016;5:e002909. DOI: 10.1161/JAHA.115.002909.
 88. Kuehn BM. Telemedicine helps cardiologists extend their reach. *Circulation*. 2016;134:1189–1191.
 89. Alsan M, Garrick O, Graziani GC. Does diversity matter for health? Experimental evidence from Oakland. NBER working paper no. 24787. Cambridge, MA: National Bureau of Economic Research; June 2018. Available at: <https://www.nber.org/papers/w24787>. Accessed November 9, 2019.
 90. Mgbako O. The unicorn. *JAMA*. 2019;321:149–150.
 91. Cooper-Patrick L, Gallo JJ, Gonzalez JJ, Vu HT, Powe NR, Nelson C, Ford DE. Race, gender, and partnership in the patient-physician relationship. *JAMA*. 1999;282:583–589.
 92. Shen MJ, Peterson EB, Costas-Muñiz R, Hernandez MH, Jewell ST, Matsoukas K, Bylund CL. The effects of race and racial concordance on patient-physician communication: a systematic review of the literature. *J Racial Ethn Health Disparities*. 2018;5:117–140.
 93. Oguz T. Is patient-provider racial concordance associated with Hispanics' satisfaction with health care? *Int J Environ Res Public Health*. 2019;16:E31. DOI: 10.3390/ijerph16010031.
 94. Yancy C, Kirtane AJ. Race/ethnicity-based outcomes in cardiovascular medicine. *JAMA Cardiol*. 2017;2:1313–1314.
 95. Sander RH. A systematic analysis of affirmative action in American law schools. *Stanford L Rev*. 2004;57:367–483.
 96. Orom H, Semalulu T, Underwood W III. The social and learning environments experienced by underrepresented minority medical students: a narrative review. *Acad Med*. 2013;88:1765–1777.
 97. Osseo-Asare A, Balasuriya L, Huot SJ, Keene D, Berg D, Nunez-Smith M, Genao I, Latimore D, Boatright D. Minority resident physicians' views on the role of race/ethnicity in their training experiences in the workplace. *JAMA Netw Open*. 2018;1:e182723.
 98. Arcidiacono P, Aucejo EM, Spenner K. What happens after enrollment? An analysis of the time path of racial differences in GPA and major choice. *IZA J Labor Econ*. 2012;1:1–24.
 99. Arcidiacono P, Aucejo E, Coate P, Hotz VJ. Affirmative action and university fit: evidence from proposition 209. *J Labor Econ*. 2014;3:1–29.
 100. Arcidiacono P, Aucejo E, Hotz VJ. University differences in the graduation of minorities in STEM fields: evidence from California. Discussion Paper Series. IZA DP No. 7227. February 2013.
 101. Case SM, Swanson DB, Ripkey DR, Bowles LT, Melnick DE. Performance of the class of 1994 in the new era of USMLE. *Acad Med*. 1996;71:S91–S93.
 102. Genao I, Gelman J. The MCAT's restrictive effect on the minority physician pipeline: a legal perspective. *Ann Intern Med*. 2018;169:403–404.
 103. Aarons CB. Shaking up residency program admissions. May 14, 2019. Available at: <https://www.aamc.org/news-insights/insights/shaking-residency-program-admissions>. Accessed November 9, 2019.
 104. Witzburg RA, Sondheimer HM. Holistic review—shaping the medical profession one applicant at a time. *N Engl J Med*. 2013;368:1565–1567.
 105. Association of American Medical Colleges. Altering the course: black males in medicine. 2015. Available at: <https://store.aamc.org/altering-the-course-black-males-in-medicine.html>. Accessed November 9, 2019.
 106. Ashe A, Pampersad A. *Days of Grace: A Memoir*. New York: Alfred A. Knopf; 1993.
 107. Heisler EJ, Panangala SV, Mendez BHP, Villagrana MA, Mitchell A. Federal support for graduate medical education: an overview. Congressional Research Service. Updated December 27, 2018. Available at: <https://fas.org/sgp/crs/misc/R44376.pdf>. Accessed November 9, 2019.
 108. Fitzgerald FT. Bakke decision revisited. *N Engl J Med*. 1982;306:307.