

ORIGINAL RESEARCH

Diversity Recruitment in Cardiovascular Specialties



Barriers and Opportunities in Postgraduate Training Programs

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ABSTRACT

BACKGROUND Diversity in postgraduate training programs can be increased through program-based recruitment strategies. Prospective applicants often examine website content to determine if training programs are inclusive and offer a good fit. Poor overlap between program director recruitment goals and program website content as a barrier to recruiting a diverse physician workforce has not extensively been studied.

OBJECTIVES The aim of this study was to characterize barriers to recruiting a diverse physician workforce in cardiovascular specialties in the United States.

METHODS Cross-sectional survey of program directors and evaluation of website content for training programs in adult general cardiology, cardiothoracic surgery, vascular surgery, and adult cardiothoracic anesthesiology.

RESULTS A total of 68 surveys were completed (response rates of 10% to 13% across specialties), and 626 websites in cardiovascular specialties were analyzed. A majority (63%) of program directors prioritized increasing diversity, although 40% of these respondents did not have a plan or resources. Program culture was cited as a barrier to recruiting a diverse workforce. The median website score for inclusion and health equity content was 4.0 out of 18.0, with a health disparities curriculum offered in <10% of websites for most specialties.

CONCLUSIONS To advance diversity in cardiovascular specialties, training programs must have inclusive learning environments perceived by prospective applicants. Barriers to recruiting a diverse physician workforce may be decreased by addressing training program culture with an emphasis on modifying training program website content to attract more diverse applicant pools. Health disparities curricula are underutilized resources in cardiovascular specialties that may support recruitment of a more diverse physician workforce. (JACC Adv. 2025;4:101525) © 2025 The Authors. Published by Elsevier on behalf of the American College of Cardiology Foundation. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

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**ABBREVIATIONS
AND ACRONYMS****ACGME** = Accreditation
Council for Graduate Medical
Education**DEI** = diversity, equity, and
inclusion

There is growing evidence that racial, ethnic, and gender diversity in medicine is important for addressing the health care needs of diverse patient populations and for addressing mutable disparities in health care treatment and outcomes for vulnerable patient communities.¹⁻⁴ In a study by Marcella et al examining outcomes of Black males who were randomly assigned to Black or non-Black physicians, patients were more likely to follow physician recommendations for cardiovascular screening services if their assigned physician was race-concordant.⁵ The authors projected the impact of race-concordant care and concluded that Black physicians might reduce the Black-White male gap in cardiovascular mortality by 19% in their study population. In a report by Saha et al³ patients with risk factors for coronary artery disease viewed vignettes recommending coronary artery bypass surgery. The vignettes varied by the physician's race, gender, age, and communication style (ie, high vs low patient-centeredness). Patient-centered communication reduced but did not eliminate the positive effects of patient-physician race concordance for Black patients.³ In another investigation by Greenwood et al examining the outcome of male and female patients with an acute myocardial infarction, female patients had better outcomes when there was physician-patient gender concordance, with no differences for men irrespective of whether the treating physician was female or male.¹ Finally, in a national study of hospitalized Medicare beneficiaries, mortality and readmission rates were lower when the treating internist was female.² The authors proposed that female physicians may be more likely to adhere to clinical guidelines, provide preventive care, and use patient-centered communication.²

Apart from improving mutable health care disparities in cardiovascular care in specific populations, attention to racial, ethnic, and gender diversity in cardiovascular specialties is important for the recruitment and retention of physicians. A survey of medical students conducted by the Association of American Medical Colleges indicated that race, ethnicity, gender, and sexual orientation are associated with intent to practice in underserved areas.⁶ The propensity of racial and ethnic minority medical

students to apply to medical specialties is also associated with representation of the medical student's racial or ethnic group among the specialty's practicing physicians.⁷ Therefore, training programs in adult general cardiology, cardiothoracic surgery, vascular surgery, and cardiothoracic anesthesiology, which have relatively low representation of racial and ethnic minorities and women,⁸⁻¹⁴ may have unique challenges in attracting and retaining racial and ethnic minority and female applicants for postgraduate training.

The Accreditation Council for Graduate Medical Education (ACGME) requires that accredited postgraduate medical training programs address: 1) social determinants of health; 2) organization of the health care system; 3) the health impact of physical and built environments; 4) structural and implicit bias.^{15,16} There are no recently published studies that examine postgraduate medical training curriculum as tools for recruiting medical students to pursue careers in cardiovascular specialties. A survey of cardiology programs by Crowley et al reported that a top concern of program directors was to select candidates that "fit in".¹⁷ In this study, only 26% of program directors who believed that diversity drove excellence in medicine were able to cite 1 to 2 references supporting this belief. This study suggests that a barrier to recruiting a diverse applicant pool in cardiology fellowships may be limited faculty expertise in diversity and inclusion and its relevance to health disparities. To our knowledge, barriers to achieving a diverse applicant pool have not been explored from the perspective of both program directors and prospective applicants to cardiovascular specialties in the United States.

The objective of this study was to assess challenges and opportunities for ACGME-accredited training programs in adult cardiology, adult cardiothoracic surgery, vascular surgery, and adult cardiovascular anesthesiology to recruit racial and ethnic minorities and women. We sought to examine program director resources and attitudes regarding recruitment, as well as available resources and opportunities for education regarding health disparities and their connections with diversity, equity, and inclusion (DEI) in medicine. We hypothesized that a barrier to recruitment of a diverse applicant pool was inadequate

The authors attest they are in compliance with human studies committees and animal welfare regulations of the authors' institutions and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the [Author Center](#).

Manuscript received February 2, 2024; revised manuscript received November 18, 2024, accepted December 2, 2024.

website content related to health disparities or DEI principles. Additionally, we hypothesized that this barrier might be a challenge for program directors who sought to attract an applicant pool that was diverse with respect to race, gender, and ethnicity.

METHODS

The Hartford HealthCare Institutional Review Board approved the study and certified that it met criteria for waiver of written informed consent because the research involved observation of publicly available data and administration of surveys without collection of individual identifiers.

TRAINING PROGRAM ELIGIBILITY. The American Medical Association's Fellowship and Residency Electronic Interactive Database was used to identify training programs in adult general cardiology, adult cardiothoracic surgery, vascular surgery, and adult cardiothoracic anesthesiology accredited by the ACGME.¹⁸ These specialties were selected because: 1) each specialty has described efforts to increase racial, ethnic, or gender workforce diversity;⁸⁻¹⁴ 2) each specialty has a direct impact on the care of patients who require evaluation and treatment for cardiovascular medical and surgical disorders; 3) each specialty is highly visible to medical students who might choose to pursue postgraduate training focused on medical or procedural treatment of patients with cardiovascular disorders. Military programs were excluded because they have specific requirements for website content. International training programs, programs from United States territories, non-ACGME-accredited programs, and programs with inactive websites were also excluded.

SURVEY DEVELOPMENT AND DISTRIBUTION. A list-serve for adult general cardiology, adult cardiothoracic surgery, vascular surgery, and adult cardiothoracic anesthesiology program directors was obtained from the ACGME. Program directors from all eligible training programs were contacted via email with a unique link to a Research Electronic Data Capture survey ([Supplemental Appendix 1](#)). Survey completion was voluntary, and there were no incentives other than contributing to advancement of study goals. Completion of the survey acknowledged consent. The survey had 12 items and took <5 minutes to complete ([Supplemental Appendix 2](#)). Survey questions were designed with consideration of prior published surveys regarding diversity in cardiovascular training programs.^{17,19}

WEBSITE ELIGIBILITY. Websites of all eligible training programs were assessed for DEI and health

equity content. We performed a Google search for each training program and evaluated the first page of results (10 listings) for direct links to training program websites. A search string was used that included terms that might be used by training program applicants: "program name + training program specialty."

WEBSITE EVALUATION CRITERIA AND SCORING. An 18-point website scoring rubric was developed by the study authors based on prior research studies that describe website scoring for diversity in cardiovascular medicine, integrated thoracic surgery, vascular surgery, general surgery, and anesthesiology training programs.²⁰⁻²⁴ Two authors (M.G. and T.S.) selected the final criteria considered most relevant to demonstration of an inclusive learning environment. This included offering training in health disparities, community engagement, or demonstrated elements that might support recruitment of underrepresented minorities and women in postgraduate cardiovascular medicine training programs. The categories for website evaluation criteria are detailed in [Table 1](#).

Training programs were credited one point for each criterion directly mentioned on the website or accessible to prospective applicants through a direct link to departmental, institutional, or affiliated organizational websites. Two independent reviewers scored each website. Discrepancies were resolved by a third, independent evaluator. All websites were accessed and evaluated between July 15, 2023, and October 15, 2023.

STATISTICAL ANALYSIS. Descriptive data are summarized as mean \pm SD when normally distributed, as median (IQR) when non-normally distributed and nonparametric, and as proportions (%) for categorical data. Website scores followed a non-normal distribution. As such, the Kruskal-Wallis test was utilized to analyze an overall difference between fellowship specialties. In the event that the Kruskal-Wallis test was significant, pairwise comparisons were made using the Bonferroni correction. For analysis of program director surveys, continuous variables were expressed as mean \pm SD or median (IQR). Categorical variables were analyzed with the chi-square test or Fisher's exact test. All effects were considered significant at $P < 0.05$. Statistical analyses were performed with SPSS 21.0 (SPSS).

RESULTS

SURVEY DEMOGRAPHICS. A total of 626 program directors of ACGME-accredited programs in cardiovascular specialties were surveyed. Eighty-four surveys were returned, of which 16 were partially

TABLE 1 Definition of Website Evaluation Criteria	
Criteria	Definition
Institutional DEI Statement and Resources	
Diversity and inclusion message	A statement from the institution or department regarding their commitment to prioritizing diversity, equity, and inclusion.
Nondiscrimination/equal opportunity statement	A legal statement from the institution about nondiscrimination on the basis of race, color, age, ethnicity, religion, national origin, pregnancy, sexual orientation, sex, disability, and gender, marital status, or veteran status.
Direct link to institutional DEI resources	A web link on the departmental page that directs the viewer to the institutional webpage on resources pertaining to diversity, equity, and inclusion.
Special interest groups or societies	Institutional groups that provide support and a sense of inclusion to underrepresented or minoritized individuals and communities. This may include, but not be limited to, groups that focus on women in medicine, racial/ethnic minorities in medicine, physician communities defined by gender or sexual orientation, and physicians with physical or other disabilities.
Externships for physicians underrepresented in medicine	Advertised opportunities for trainees from underrepresented backgrounds in medicine to participate in away externships/rotations at the institution.
Departmental DEI Resources	
DEI Curriculum	A formal curriculum, ie, part of the didactic program focused on diversity, equity, and inclusion and health care disparities/inequities (eg, lectures, grand rounds)
DEI and/or Health Equity Committee	A designated committee to specifically oversee diversity, equity, and inclusion and/or health equity engagement within the department.
Demographic description of patient communities served by clinical training sites	A description of the clinical training sites that trainees rotate through as it pertains to demographics of the population.
Social Media advertising of program-affiliated DEI/Health Equity activities	Social media web links (eg, Facebook, Linked-In, Doximity, Twitter) that advertise intramural DEI and health equity scholarship activities
Faculty Scholarship and DEI Leadership	
DEI Leadership Position	A faculty leadership position that oversees the diversity, equity, and inclusion committee of the program.
DEI/Health Equity Scholarship (research protocols, publications, presentations, grants)	The program website showcases evidence of academic achievement or advancement of faculty or trainees through research, publications, professional meeting attendance, grants in the field of diversity, equity, and inclusion or health disparities.
Specialty DEI and/or Health Equity Committee Engagement	The program showcases evidence that the diversity, equity, and inclusion committee is actively engaged in relevant DEI and local community activities.
Fellow Diversity	
Biographies of matriculated fellows	An individualized description of the matriculated program trainees that highlights unique characteristics beyond simply medical school attended.
Photos of matriculated fellows	The biographies of matriculated program trainees include their digital photo.
Publication of program statistics regarding fellowship matriculants for geographic diversity, gender, race, ethnicity, religion, and disability	Geographic diversity of training program matriculants refers to biographies that indicate the percentage of trainees who received graduate medical training outside of the home institution, outside of the state for the training program, outside of the country, in public vs private institutions, or university-based vs community and university-affiliated training programs.
Affiliation with Organizations Focused on Addressing DEI/Health Care Disparities in Cardiovascular Medicine	
Special Interest Groups or Societies	Training program recruitment participation at conferences by medical organizations such as the National Medical Association, National Hispanic Medical Association, Association of Black Cardiologists, Women in Cardiology Section of the American College of Cardiology, Women in Cardiothoracic Anesthesiology of the Society of Cardiovascular Anesthesiologists, DEI Committee of the Society of Cardiovascular Anesthesiologists, Women in Thoracic Surgery, Women in Vascular Surgery, Society of Vascular Surgery Women's Section, or Society of Black Vascular Surgeons
Community Engagement in Addressing Health Disparities	
Health Equity/Health care Disparities Rotations/Electives	The program offers trainees the opportunity to choose electives or rotations at underserved clinical sites for the purpose of advancing health equity and disparities knowledge.
Global Health Electives	The program offers trainees the opportunity to rotate outside the United States in order to gain global health experience.
DEI = diversity, equity, and inclusion.	

completed. Answers for 68 completed surveys were analyzed. The response rate ranged from 10% to 13% across specialties with a median program size of 2 to 15 trainees (Table 2). There were higher rates of response from the Midwest, Northeast, and South regions of the United States compared to the West (Figure 1). Most respondents were university-affiliated. Program directors determined the university-affiliated vs community program identity of the training program, and no explicit definitions were provided in the program director survey (Figure 1).

PERCEPTIONS REGARDING THE IMPORTANCE OF DIVERSITY. Eighty-four percent of survey respondents strongly agreed or agreed with the statement, “I believe that DEI and health care disparities should be a high priority in my trainee’s education.”

Eighty-five percent of respondents strongly agreed or agreed with the statement, “I believe that a professional environment that embraces a DEI/health care disparities curriculum may support the professional development and continuing education of faculty/staff/trainees,” and 84% of respondents strongly agreed or agreed that they were “receptive to an interdisciplinary education opportunity focused on DEI/health care disparities” (Figure 2).

INTEREST IN INCREASING TRAINING PROGRAM DIVERSITY. Thirty-seven percent of survey respondents felt that their program “is already diverse, so diversity does not need to be increased.” Sixty-three percent of respondents wanted to increase diversity in their training program. Only 60% of respondents had a plan to increase diversity, 35% of respondents did not know how to accomplish this goal, and 5% of respondents indicated that they did not have the resources (Figure 2).

RECRUITMENT PRACTICES. Ninety-six percent of survey respondents had a diversity recruitment strategy. The most common recruitment methods were: 1) prioritizing diversity in interview invitations (71%); 2) prioritizing diversity in the applicant rank list (66%); 3) prioritizing diversity of faculty who interview applicants (53%). Only 44% of respondents indicated that website updates were a top recruitment method even though diversity recruitment was a priority for 84% of program directors who completed surveys. There was not a statistically significant difference in recruitment strategies between cohorts except in prioritizing diversity in interview invitations. Adult general cardiology was more likely to prioritize diversity in offering interviews than the pooled cohort for adult cardiothoracic surgery, adult

TABLE 2 Program Director Response Rate and Training Program Size by Cardiovascular Specialty

	Adult General Cardiology	Adult Cardiothoracic Anesthesiology	Adult Cardiothoracic Surgery	Vascular Surgery
Survey responses by specialty	25	10	13	20
Number of programs by specialty	261	75	103	187
Response rate by specialty	10%	13%	13%	11%
Number of trainees each year	4 (2-5.5)	3 (2-6)	15 (11-18)	2 (2-3)

Values are n, %, or median (IQR).

cardiothoracic anesthesiology, and vascular surgery (92% vs 58%, $P = 0.003$) (Figure 2).

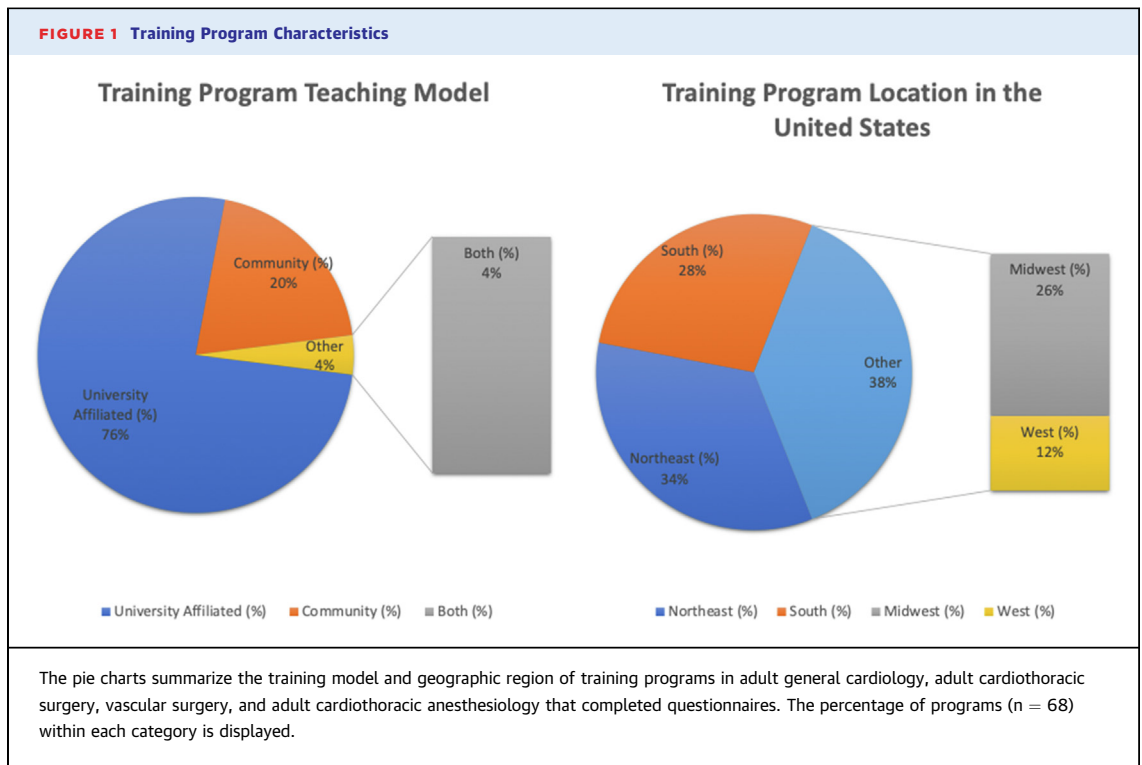
The top criteria that all respondents considered when constructing an applicant rank list were: 1) ability to fit in well/team player (79%); 2) clinical skills (72%); and 3) potential as an academic leader (40%). There were no differences in these responses between the adult general cardiology and the pooled cohort for adult cardiac surgery, adult cardiothoracic anesthesiology, and vascular surgery (Figure 2).

DIVERSITY EDUCATION INITIATIVES. Of the 96% of respondents who indicated that their programs utilize diversity education initiatives, 45% indicated that they refer to institutional DEI resources, 41% indicated that they utilize discrete lectures or grand rounds on DEI and/or health disparities, and 14% reported a formal didactic program or experienced-based opportunities related to DEI or health disparities. There were no significant differences in these responses between cohorts (Figure 2).

PERCEPTIONS OF BARRIERS TO ADVANCE DIVERSITY. The top concerns reported to be barriers to increasing training program diversity were: 1) perceived lack of a qualified applicant pool (69%); 2) insufficient resources to support underrepresented minority/women trainees (51%); 3) program culture (38%). There were no significant differences in these responses between cohorts (Figure 2).

WEBSITE CONTENT SCORES. A total of 654 ACGME-accredited training programs were identified. Four military programs, 3 programs from United States territories, and 21 programs with nonfunctioning websites were excluded. A total of 626 training program websites were evaluated including 75 training programs in adult cardiothoracic anesthesiology, 261 in adult general cardiology, 187 in vascular surgery, and 103 in adult cardiothoracic surgery (Figure 3).

The median website score for all programs was 3.0 with an IQR of 2.0 to 5.0, and the mean was 4.0 with a maximum possible score of 18.0 (Figure 4). Across



specialties, the median website score was the highest for adult cardiothoracic surgery and followed in descending rank order by vascular surgery, adult general cardiology, and adult cardiothoracic anesthesiology (Figure 5).

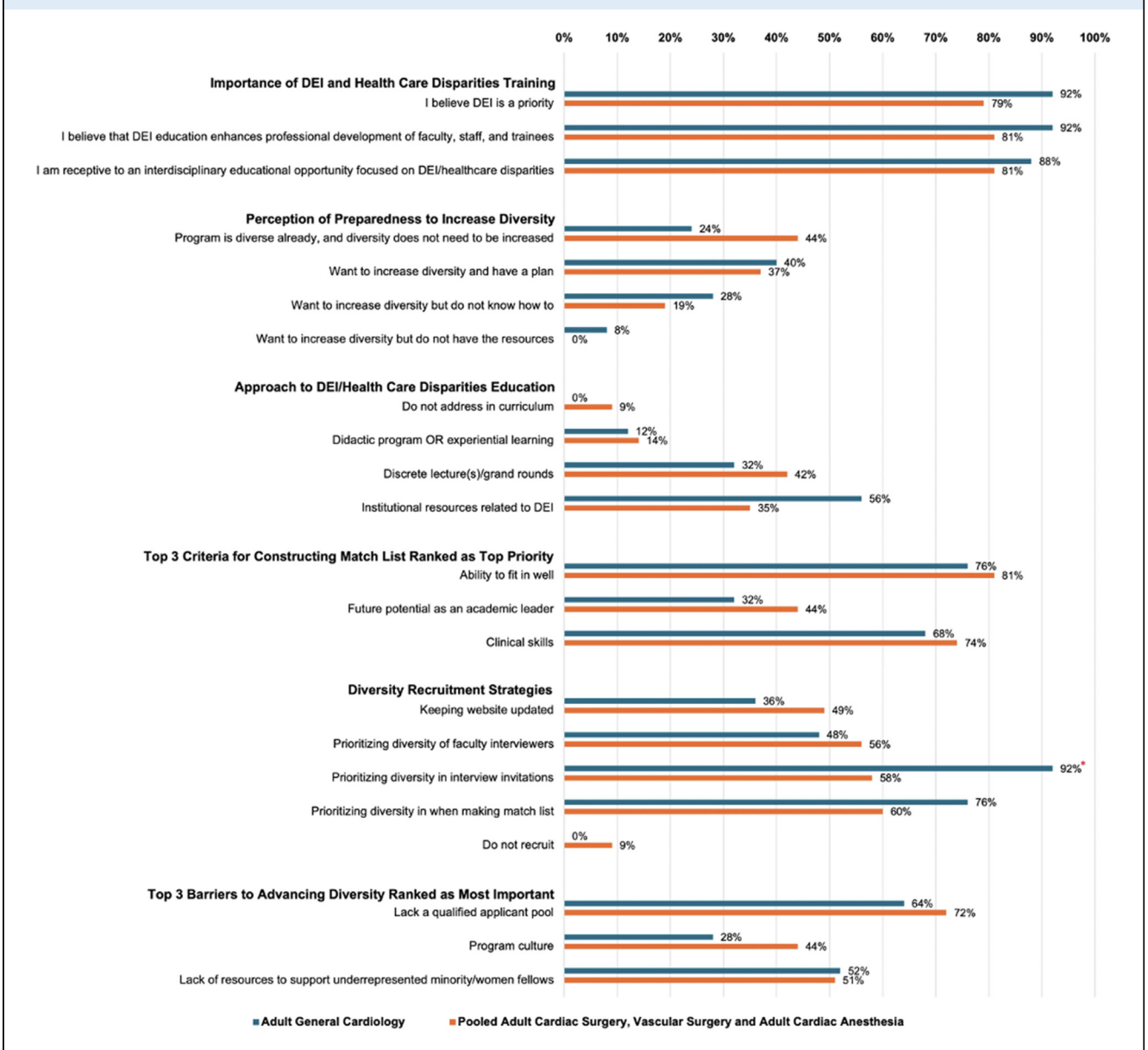
Most websites for adult general cardiology (86.5%), adult cardiothoracic surgery (99.5%), and vascular surgery (58.6%) had a diversity and inclusion message and/or a nondiscriminatory/equal opportunity statement, and most vascular surgery websites (57.5%) contained a link to institutional DEI resources. Most websites for adult general cardiology (71%), adult cardiothoracic surgery (63.6%), and vascular surgery (68.1%) had photographs of matriculated residents. Vascular surgery websites were most likely to include information regarding externships for students underrepresented in medicine, diversity or health equity curricula, diversity/health equity committee, diversity leadership position, diversity/health equity scholarship, or affiliation with societies that address diversity/health equity. Vascular surgery websites were also most likely to describe health equity electives, global health electives, or include statistics for geographic and/or demographic diversity of trainees (Table 3).

DISCUSSION

Our results demonstrate several important findings. First, most program directors in cardiovascular specialties who completed our survey believed that diversity, inclusion, and health disparities education improves the environment for professional development. This is consistent with recent survey results for cardiology program directors.^{17,19} Second, among the program directors who prioritized diversity, 40% indicated that they did not have a plan or resources to accomplish this goal. Third, the most common approach to promote diversity was interviewing and ranking applicants as opposed to attracting a diverse pool of applicants. A significant percentage of program directors believed that program culture is a barrier to advancing diversity. Our finding that program culture is a barrier to recruiting a diverse class of trainees may be relevant to our finding that program “fit” was the highest priority for trainee selection in the cardiovascular specialties studied. Finally, our analysis of program websites suggests that development of content related to health equity might attract a more diverse applicant pool.

We scored websites to assess inclusiveness from the perspective of prospective applicants. Our

FIGURE 2 Frequency Distribution of Program Director Survey Responses for Adult General Cardiology Versus Pooled Adult Cardiac Anesthesiology, Adult Cardiothoracic Surgery, and Vascular Surgery Cohorts

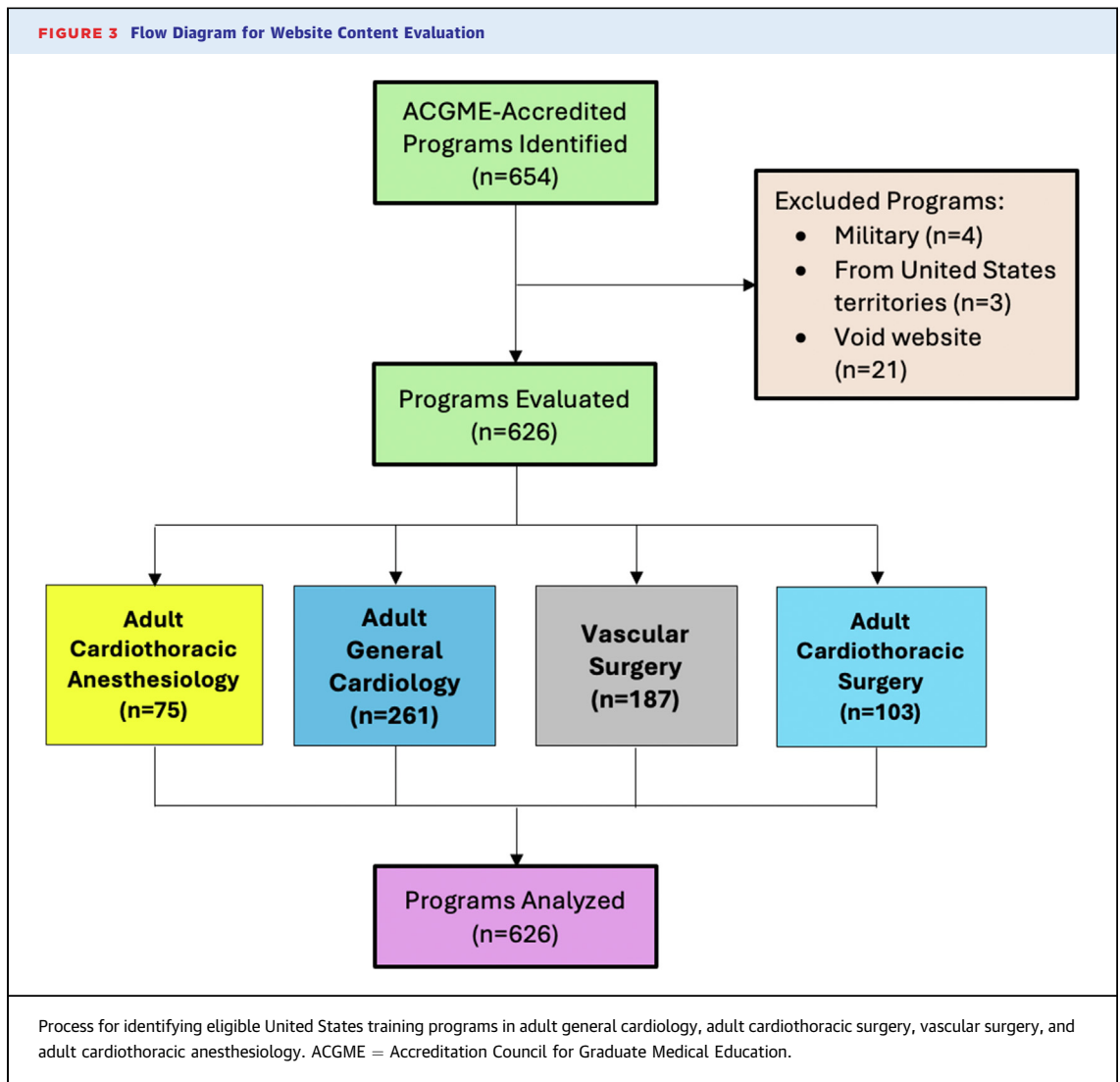


The histogram illustrates the frequency of program director survey responses. *Statistical significance at $P < 0.05$. DEI = diversity, equity, and inclusion.

assessment of website diversity, inclusion, and health equity scholarship content indicates that institutional resources are utilized more commonly than internal training program resources to address diversity and inclusion in cardiovascular ACGME-accredited training programs. Few training programs profiled faculty leadership or scholarship focused on diversity, inclusion, or health disparities. These results may be consistent with our survey results indicating

that program culture is a barrier to recruitment of a diverse applicant pool in these cardiovascular specialties.

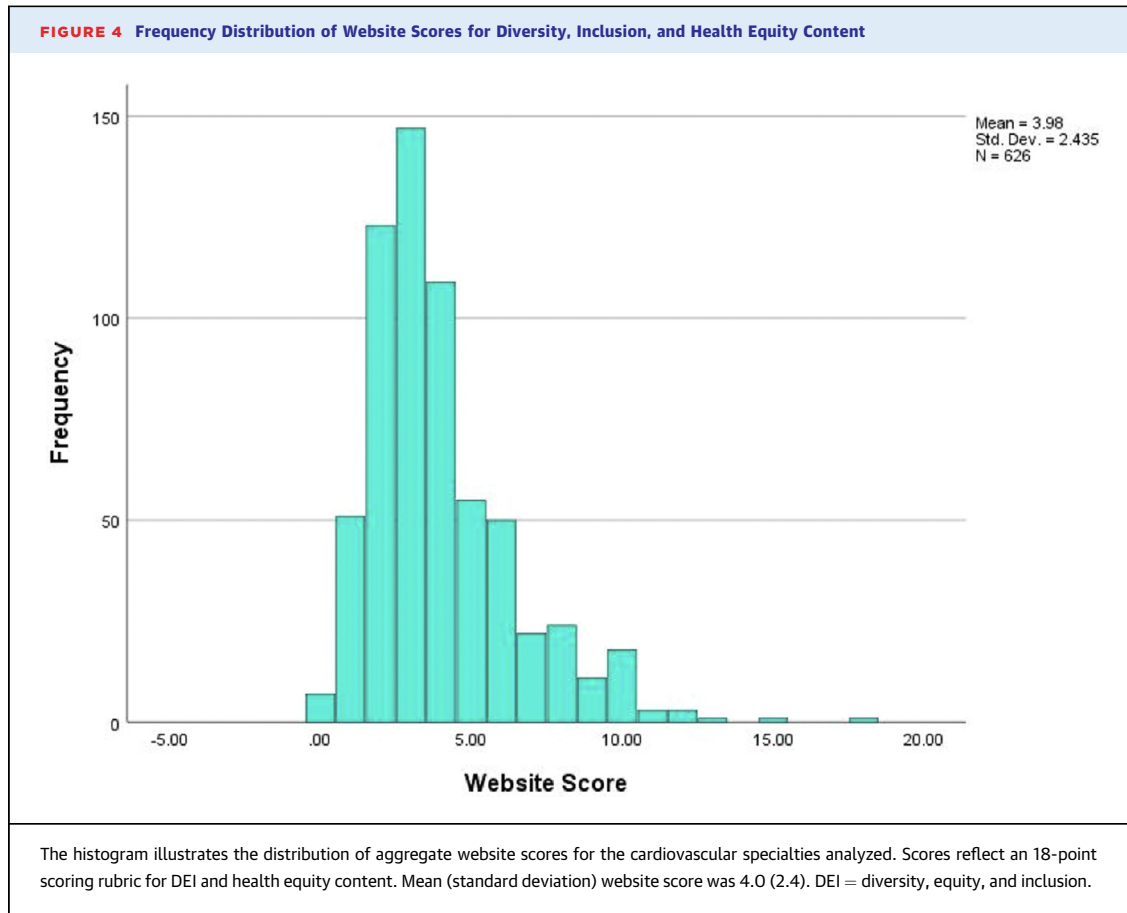
The strengths of our study include receipt of survey responses from program directors with relatively balanced geographic representation across the United States. This is important given that postgraduate training programs receive applications from individuals who have connections to the location of the



training programs that they select. Given the demographic, economic, and sociocultural differences between geographic regions of the United States, balanced representation of our program director survey responses from the Northeast, South, Midwest, and West geographic regions is crucial. Such representation may provide greater insight about national challenges in recruitment for physicians in cardiovascular specialties, rather than if our responses were predominantly from one geographic region.

An additional strength of the study is that we evaluated all eligible training program websites in adult general cardiology, adult cardiothoracic surgery, vascular surgery, and adult cardiothoracic anesthesiology in the United States. Website evaluation criteria were designed not only to reflect the interests of potential training program applicants but

also to examine the interests of applicants who might seek career pathways that include leadership, scholarship, and community engagement focused on addressing the health care needs of medically underserved communities. Our website scoring data, in combination with program director survey data, support analysis of the preparedness of cardiovascular specialties to advance racial, ethnic, and gender diversity in the physician workforce. Our findings suggest that an important approach for increasing racial, ethnic, and gender diversity in the studied cardiovascular specialties may be for program directors to create learning environments that include scholarship in health disparities. Our findings also suggest that these curricular programs might be developed at a departmental or training program level and that, in limited resource settings, they



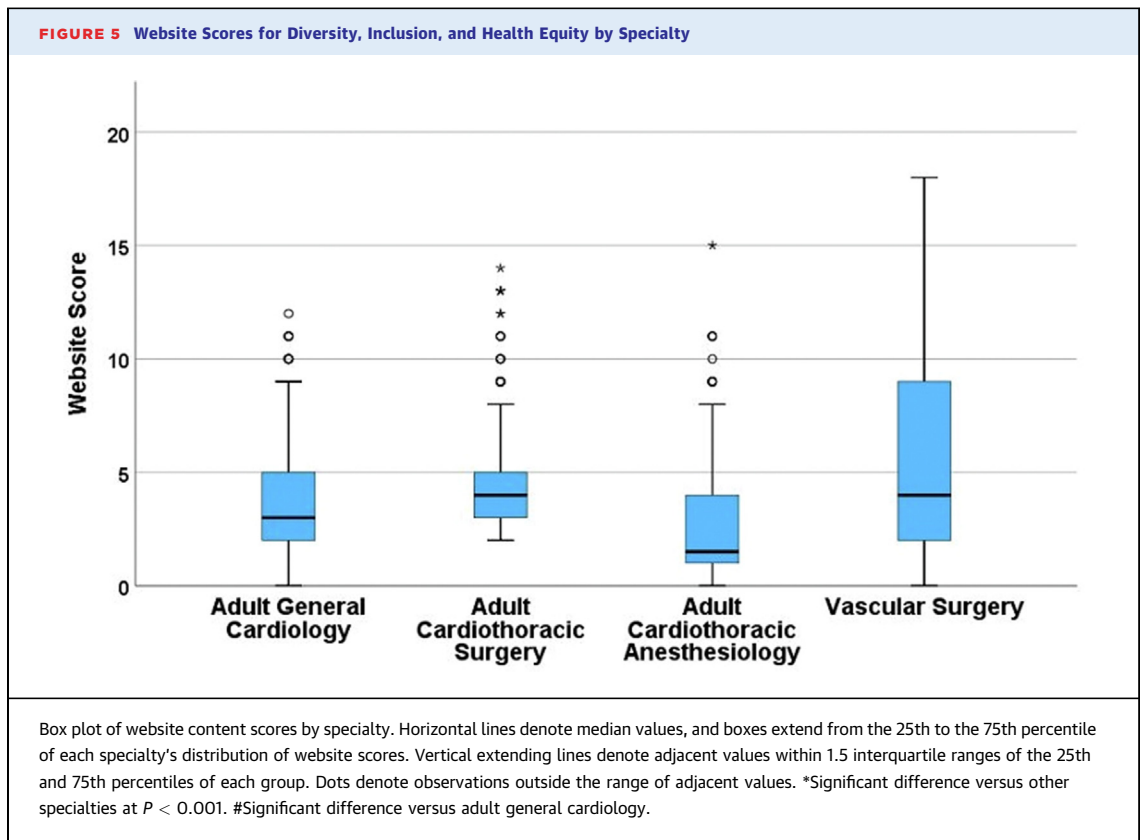
might be shared with and supported by cardiovascular specialties that have similar goals. Finally, our data suggest these collaborative efforts in curriculum development might be advertised on training program websites to attract a diverse training program applicant pool.

Recent research has shown that primary care medicine specialties may be more successful than surgical specialties in incorporating underrepresented minorities in leadership roles in academic medicine.²⁵ In our study, program directors in adult general cardiology were more likely than program directors in adult cardiothoracic surgery, vascular surgery, and adult cardiothoracic anesthesiology to prioritize diversity in interview invitations. This finding may be consistent with research demonstrating that racial and ethnic minorities are more likely to apply for residency training in fields where they observe representation of their demographic group.⁷ Our findings suggest that in order to advance racial, ethnic, and gender diversity in cardiovascular specialties in the United States, it may be important to impact training program culture. This finding is

consistent with a recent report by Damp et al describing that adult cardiology fellowship program culture was one of the 2 most significant barriers to increasing diversity.¹⁹

Our data also suggest that training program scholarship, and leadership positions focused on diversity and health equity are not prominent features of the postgraduate learning environment for the cardiovascular training programs studied. This is consistent with findings reported by Crowley et al¹⁷ describing that only 26% of cardiology fellowship program directors could cite 1 to 2 references supporting why diversity was a driver of excellence in health care. Our data are also consistent with a report by Donenfeld et al²¹ that concluded that adult cardiology fellowship websites have insufficient description of educational services to attract applicants who rely on websites to screen training programs.

Our results differ from an earlier survey of cardiology program directors where 69% of survey respondents felt that diversity drove excellence in health care and 63% of respondents reported that their training programs were already diverse and



diversity did not need to be increased.¹⁷ Approximately 85% of our survey respondents agreed or strongly agreed that diversity and health disparities curricula support professional development of faculty and trainees, and only 37% of respondents felt that their training programs were already diverse and that diversity did not need to be increased. This may indicate time-driven evolution of perceptions regarding diversity and health equity scholarship in some cardiovascular specialties. It is also possible that these differences may reflect differences in program director response rates, differences in survey design, or the fact that our study examined multiple cardiovascular specialties as opposed to adult cardiology fellowships.

By examining website content in multiple cardiovascular specialties, our data builds on the findings from Damp.¹⁹ Our findings suggest that advances in recruitment of a more diverse workforce in the cardiovascular specialties studied might be achieved through departmental leadership roles for trainees and faculty focused on diversity, inclusion, and health disparities. Recruitment may also be supported by implementation of expanded selection criteria for trainees and faculty that target how

training programs would like to evolve as opposed to “fitting in” with historical paradigms.

Our program director survey and website evaluation criteria were constructed as novel instruments for use in the present study and have not been validated in previously published reports with reliability and validity testing. However, both tools were based on survey instruments and published website criteria from prior national studies on diversity in specialties that include adult general cardiology, thoracic surgery, vascular surgery, and anesthesiology.²⁰⁻²⁴

There are additional limitations to this study. Our survey response rate ranged from 10% to 13%, which may affect the generalizability of our findings even though this response rate was in the range for email surveys.²⁵ Responses may reflect views from program directors who promote diversity in training, and therefore the data may be subject to sampling bias. We did not obtain age, race, ethnicity, gender, disability, years of work experience, academic seniority level, or the percentage of underrepresented minorities and women in our survey. These data may have supported assessment of survey responses regarding institutional culture and resources to promote recruitment of racial and ethnic

TABLE 3 Frequency of Website Evaluation Criteria by Clinical Specialty

Website Evaluation Criteria	Adult General Cardiology	Adult Cardiothoracic Surgery	Adult Cardiothoracic Anesthesia	Vascular Surgery	P Value
Institutional DEI Statement and Resources					
Diversity and inclusion message	435 (86.5)	205 (99.5)	40 (24.1)	215 (58.6)	<0.001
Nondiscrimination/equal opportunity statement	492 (97.8)	205 (99.5)	95 (57.2)	361 (98.4)	<0.001
Direct link to institutional DEI resources	97 (19.3)	60 (29.1)	38 (22.9)	211 (57.5)	<0.001
Special interest groups or societies	45 (8.9)	24 (11.7)	13 (7.8)	61 (16.6)	0.002
Externships for physicians underrepresented in medicine	2 (0.4)	5 (2.4)	5 (3.0)	48 (13.1)	<0.001
Departmental DEI Resources					
DEI Curriculum	8 (1.6)	8 (3.6)	6 (3.6)	77 (21.0)	<0.001
DEI and/or Health Equity Committee	8 (1.6)	37 (18.0)	34 (20.5)	141 (38.4)	<0.001
Demographic description of patient communities served by clinical training sites	91 (18.1)	32 (15.5)	8 (4.8)	42 (11.4)	<0.001
Social media advertising of program-affiliated DEI/health equity activities	3 (0.6)	18 (8.7)	4 (2.4)	52 (14.2)	<0.001
Faculty Scholarship and DEI Leadership					
DEI Leadership Position	10 (2.0)	26 (12.6)	34 (20.5)	118 (32.2)	<0.001
DEI/Health Equity Scholarship (research protocols, publications, presentations, grants)	93 (18.5)	35 (17.0)	17 (10.2)	99 (27.0)	<0.001
Specialty DEI and/or Health Equity Committee Engagement	6 (1.2)	36 (17.5)	29 (17.5)	116 (31.6)	<0.001
Fellow Diversity					
Biographies of matriculated fellows	99 (19.7)	56 (27.2)	13 (7.8)	85 (23.2)	<0.001
Photos of matriculated fellows	357 (71.0)	131 (63.6)	64 (38.6)	250 (68.1)	<0.001
Publication of program statistics regarding fellowship matriculants for geographic diversity, gender, race, ethnicity, religion, and disability	9 (1.8)	1 (0.5)	0 (0.0)	23 (6.3)	<0.001
Affiliation with Organizations Focused on Addressing DEI/Health Care Disparities in Cardiovascular Medicine					
Special interest groups or societies	45 (8.9)	24 (11.7)	13 (7.8)	61 (16.6)	0.002
Community Engagement in Addressing Health Disparities					
Health Equity/Health Care Disparities Rotations/Electives	54 (10.7)	0 (0.0)	5 (3.0)	39 (10.6)	<0.001
Global Health Electives	12 (2.4)	15 (7.3)	7 (4.2)	62 (16.9)	<0.001

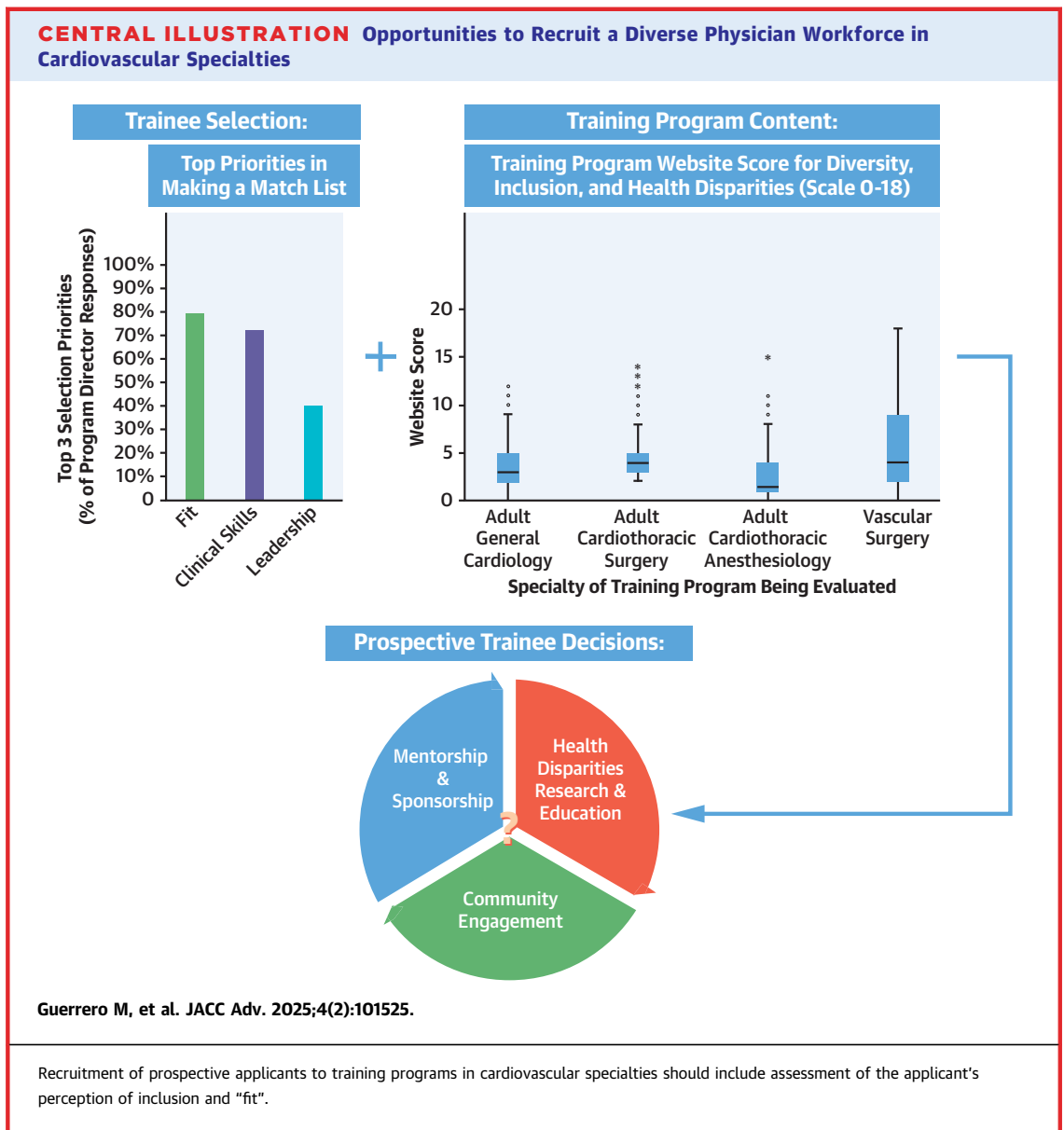
Values are n (%).
 DEI = diversity, equity, and inclusion.

minorities and women in cardiovascular specialties. However, our study design was able to assess resources focused on diversity and health disparities through evaluation of program websites. Finally, because our survey was anonymous, we cannot correlate program director responses with specific training program characteristics.

We evaluated the presence or absence of website criteria without assessing the quality of the content. All selection criteria were considered with equivalent weight. Therefore, our website analyses may not have detected subtleties in website design that may impact recruitment of a diverse physician workforce. Our study also may not have analyzed all of the criteria that prospective applicants utilize when examining websites for cardiovascular specialties. We analyzed program director survey responses for 2 cohorts (ie,

adult general cardiology vs a pooled cohort for adult cardiothoracic surgery, vascular surgery, and adult cardiothoracic anesthesiology). Adult general cardiology, vascular surgery, adult cardiothoracic surgery, and adult cardiothoracic anesthesiology programs enroll trainees at different stages of training. Differences in the entry point to these specialties may have confounded our results. However, our program director survey and training program website scores focused on the attitudes of program directors and evaluation of the training program learning environment, and we did not directly analyze the perspectives of prospective applicants or current trainees.

Some training programs may not list DEI initiatives on their website due to the presence of a larger institutional diversity, health equity, and inclusion department with broader initiatives. We examined



training program websites for links to institutional resources as demonstrating engagement in recruiting a diverse physician workforce. A limitation of this approach is that training programs that have robust curricula to support racial, ethnic, and gender diversity in their training programs may be difficult to distinguish from programs that rely on institutional resources. This distinction is important because internal resources may be more likely to impact the daily lived experiences of graduate medical education learners. However, we utilized multiple criteria for website analyses, and the total score reflected the sum of website content that was identified by independent reviewers.

Finally, our website scoring rubric did not evaluate all possible concerns that might impact recruitment of a diverse physician workforce in cardiovascular specialties. A more comprehensive list of criteria might have included assessment of training program accommodations for trainees with children, trainees with financial assistance needs, and trainees with disabilities, as well as other criteria.

CONCLUSIONS

Our data indicate that program "fit" remains the top priority for trainee selection in cardiology^{17,19} and further suggest that program fit may be the leading

priority for program directors in adult cardiothoracic surgery, vascular surgery, and adult cardiothoracic anesthesiology. This finding is important given that health care disparities are prevalent in cardiovascular specialties, and each of the specialties studied lacks racial, ethnic, and gender diversity in the physician workforce.⁸⁻¹⁴ Our survey data suggest that program director perception of a small applicant pool is a barrier for diversity in cardiovascular training programs, while our website scoring data suggest that there are opportunities to increase the size of applicant pools through website description of leadership roles, curricula, and organizational affiliations focused on diversity, inclusion, and health care disparities. Future studies should examine opportunities for training programs in adult cardiovascular specialties to collaborate on research and curriculum development in order to address ACGME goals for training in systems-based practice, social determinants of health, and quality improvement (**Central Illustration**). Such collaboration might target recruitment of racial and ethnic minorities and women to cardiovascular specialties by recognizing the passions of prospective applicants who prioritize learning about diversity, inclusion, and its data-driven connections with addressing mutable health care disparities.

FUNDING SUPPORT AND AUTHOR DISCLOSURES

The authors have reported that they have no relationships relevant to the contents of this paper to disclose.

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PERSPECTIVES

COMPETENCY IN SYSTEMS-BASED PRACTICE: There is support among program directors in adult general cardiology, adult cardiothoracic surgery, vascular surgery, and adult cardiothoracic anesthesiology to prioritize diversity in their training programs. Some program directors perceive that program culture, available resources, and a small applicant pool are barriers to recruitment. Many training programs in these specialties rely on institutional resources to promote diversity and inclusion, whereas structured curricula, organizational affiliations, and community engagement opportunities focused on cardiovascular health disparities are underutilized.

TRANSLATIONAL OUTLOOK: Future research is needed to examine the impact of health disparities curricula on racial, ethnic, and gender diversity in cardiovascular specialties. Because the perceived barriers to recruiting a diverse physician workforce are shared between adult general cardiology, adult cardiothoracic surgery, vascular surgery, and adult cardiothoracic anesthesiology program directors, multispecialty collaboration on health disparities scholarship and curriculum development may be feasible.

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- KEY WORDS** cardiovascular specialties, diversity, health disparities curricula, program director survey, website content
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- APPENDIX** For an expanded Methods section, please see the online version of this paper.