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Gender and ethnic diversity in academic general surgery department leadership

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ABSTRACT

Background: Diversity in surgery has been shown to improve mentorship and patient care. Diversity has improved among general surgery (GS) trainees but is not the case for departmental leadership. We analyzed the race and gender distributions across leadership positions at academic GS programs.
Methods: Academic GS programs (n = 118) listed by the Fellowship and Residency Electronic Interactive Database Access system were included. Leadership positions were ascertained from department websites. Gender and race were determined through publicly provided data.
Results: Ninety-two (79.3%) department chairs were white and 99 (85.3%) were men. Additionally, 88 (74.6%) program directors and 34 (77.3%) vice-chairs of education were men. A higher proportion of associate program directors were women (38.5%). Of 787 division-chiefs, 73.4% were white. Only trauma had >10% representation from minority surgeons. Women represented >10% of division chiefs in colorectal, thoracic, pediatric, and plastic/burn surgery.
Conclusion: Diversity among GS trainees is not yet reflected in departmental leadership. Effort is needed to improve disparities in representation across leadership roles.

Introduction

In the late 1990s through the early 2000s, there was a decline in U.S. medical graduates interested in a career in general surgery. More foreign medical graduates, women, and underrepresented minorities filled surgical residency spots, leading to a natural increase in the diversity of the field. In 2004, there was a resurgence in the popularity of general surgery residencies, likely due to systematic efforts to attract medical students and the changing surgical work environment to accommodate a variety of lifestyles.[1] Through initiatives such as the Accreditation Council for Graduate Medical Education's (ACGME) incorporation of cultural competency into residency curriculums, the entire resident workforce, including general surgery, has grown more inclusive of women and underrepresented minorities.[2]

With general surgery trainees becoming more representative of the general population in terms of gender and racial diversity[1], it is reasonable that representation of females and underrepresented minorities in surgical leadership positions would also increase. However, women continue to be under-represented in residency program leadership, with low comparative representation in program director positions based on medical school faculty and resident workforce.[3] They are also outnumbered in terms of associate program director positions, but have a stronger presence there, making up 29.6% of all U.S. associate program directors in 2018.[4] In an 11-year review of the Association of Program Directors in Surgery (APDS), of the 233 leadership positions that were available, only 10% were held by non-white surgeons. Between 2017 and 2018, there was an increase in positions held by non-white people and women alike.[5] However, in recent studies of membership and leadership in prominent surgical societies, women and racial minorities are disproportionately underrepresented in officer positions compared with general membership alone.[6]

To our knowledge, there is no prior study of academic surgical

Abbreviations: ACGME, Accreditation Council for Graduate Medical Education; APDS, Association of Program Directors in Surgery; AMA, American Medical Association; FREIDA, Fellowship and Residency Electronic Interactive Database.

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leadership diversity including section and division leadership roles. There is also a paucity of literature concerning racial minorities in leadership, especially as section heads. Developing a better understanding of racial and gender gaps would allow us to create actionable goals for improving diversity. This would, in-turn, foster mentorship, diversify the workforce, and improve our ability to care for patients by incorporating different cultural perspectives[7] In this observational study, we analyzed the composition of residency program leadership across academic surgery departments. It is our goal to highlight the progress of the field, identify areas for improvement to ensure that leadership is representative, not only of trainees and faculty, but also the patients we serve, and to describe methods to narrow these racial and gender gaps in surgery.

Materials and methods

Using the 2019 version of the American Medical Association (AMA) Fellowship and Residency Electronic Interactive Database (FREIDA) System, academic general surgery programs were identified. FREIDA designates academic general surgery programs as, "University-Based." Programs designated as, "Community-Based," and "Community-Based/University Affiliated," were excluded from the analysis. Residency leadership was determined using the associated residency program website and was corroborated by the names provided on the FREIDA database. Information on division and section leadership was gathered from surgery department websites. Two independent reviewers determined gender and race. They utilized biographical information and photographs provided on department websites in conjunction with public information from the AMA.

Gender designation was either male or female based on the pronouns used on department websites and photos. Race categories included white, black, Hispanic/Latino, Asian or Pacific Islander, and other URMs (American Indian, Alaskan Native, Native Hawaiian). If there was no information available to aid in delineating race, it was recorded as missing data. Residency leadership positions recorded included program director and up to three associate program directors. The surgery department chair, vice chair of education, and division leadership common to many surgery programs were included, as well. These divisions included colorectal, cardiac, cardiothoracic, surgical oncology, vascular, trauma/acute care surgery, pediatrics, transplant, plastics/burn, and general surgery. If the division did not exist within the department or there was no designated section leadership, it was recorded as missing data. Categorical data is listed as n (%). Statistical analysis was performed utilizing JMP Pro 14.0 (SAS Institute, Cary, NC). This project was exempt from IRB review.

Results

Demographics of programs

One hundred and eighteen university-based academic general surgery programs were identified utilizing FREIDA. All programs had a program director listed on their departments' website and all but two had a department chair listed. Additional department leadership, such as vice chair of education, associate program director, and division chiefs, varied by program. Twenty-four programs were based in the Midwest, 36 in the Northeast, one in Puerto Rico, 45 in the South, and 12 in the West.

Analysis of education leadership

We first looked at race and gender amongst education and promotional leadership in each department, including chairs, vice chairs of education, program directors, and associate program directors. The number of positions across the country can be seen in Fig. 1. Among program directors, 90 (76.3%) were white, seven (5.9%) were black, five (4.2%) were Hispanic, eleven (9.3%) were Asian/Pacific Islander, and five (4.2%) were of other less represented races. Of the 116 department chairs, 92 (79.3%) were white, five (4.3%) were black, one (0.9%) was Hispanic, 13 (11.2%) were Asian/Pacific Islander, and five (4.3%) were of other less represented races. The racial distribution of associate program directors (n = 110) and vice-chairs of education (n = 44) was similar (Table 1).

The majority of education leadership was comprised of men. Ninety-nine (85.3%) department chairs, 34 (77.3%) vice-chairs of education, and 88 (74.6%) program directors were men (Table 2). The proportion of women serving in education leadership was highest at the position of associate program director, with 42 (38.5%) of the 109 associate program directors being women. There were no significant differences regarding race or gender across education leadership by region ($p > 0.05$, data not shown).

Since a higher proportion of associate program directors were women, we performed a subset analysis to determine if differences existed between programs based on the number of associate program directors. To perform this analysis, we compared associate program directors at institutions with two or more faculty members serving at this position compared to institutions with only one faculty member. Although not significant, there was a trend towards a higher proportion of women serving as associate program director at institutions with more than one position (42.7% vs 25.9%, $p = 0.17$).

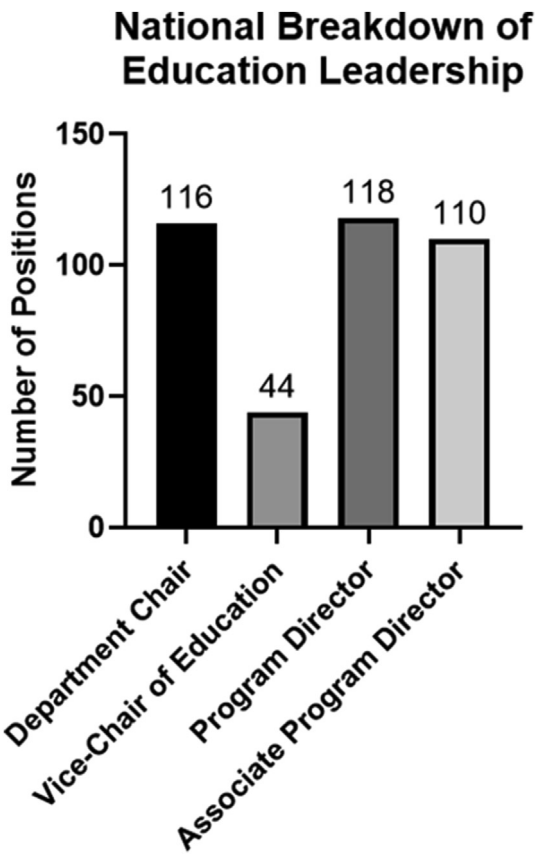

Fig. 1. National breakdown of education leadership across all university-based academic general surgery programs.

Table 1
Analysis of race in general surgery leadership.

Leadership Position	White	Black	Hispanic	API	Other
Education Leadership					
Chair	92 (79.3%)	5 (4.3%)	1 (0.9%)	13 (11.2%)	5 (4.3%)
Vice Chair of Education	34 (77.3%)	1 (2.3%)	0 (0%)	8 (18.2%)	1 (2.3%)
Program Director	90 (76.3%)	7 (5.9%)	5 (4.2%)	11 (9.3%)	5 (4.2%)
Associate Program Director	74 (67.3%)	5 (4.5%)	6 (5.4%)	20 (18.2%)	5 (4.5%)
Division Chiefs					
Colorectal Surgery	54 (79.4%)	3 (4.4%)	0 (0%)	4 (5.9%)	7 (10.3%)
Cardiothoracic Surgery	42 (73.7%)	1 (1.8%)	0 (0%)	9 (15.8%)	5 (8.8%)
Cardiac Only	23 (65.7%)	0 (0%)	1 (2.9%)	8 (22.9%)	3 (8.6%)
Thoracic Only	26 (74.3%)	3 (8.9%)	2 (5.7%)	4 (11.4%)	0 (0%)
Surgical Oncology	55 (67.9%)	5 (6.2%)	1 (1.2%)	14 (17.3%)	6 (7.4%)
Trauma/Acute Care Surgery	66 (72.5%)	11 (12.1%)	5 (5.5%)	8 (8.8%)	1 (1.1%)
Pediatric Surgery	68 (78.2%)	3 (3.4%)	1 (1.1%)	14 (16.1%)	1 (1.1%)
Transplant Surgery	55 (68.8%)	3 (3.8%)	6 (7.5%)	9 (11.3%)	7 (8.8%)
Plastic/Burn Surgery	68 (74.7%)	1 (1.1%)	2 (2.2%)	16 (17.7%)	4 (4.4%)
Vascular Surgery	66 (72.3%)	1 (1.1%)	2 (2.2%)	13 (14.3%)	9 (9.9%)
General Surgery	55 (74.3%)	2 (2.7%)	3 (4.1%)	10 (13.5%)	4 (5.4%)

API: Asian/Pacific Islander

Analysis of division chiefs

A total of 787 division chiefs were identified at these university-based institutions across all specialties within general surgery. The breakdown of division chiefs can be seen in Fig. 2. 578 (73.4%) of the division chiefs were white, 33 (4.2%) were black, 20 (2.5%) were Hispanic, 109 (13.9%) were Asian/Pacific Islander, and 47 (6%) were another less represented race (Table 1). Only trauma and acute care surgery had greater than 10% representation for black surgeons and no division had greater than 10% representation for Hispanic surgeons. Asian/Pacific Islanders made up greater than 20% of chiefs in cardiac surgery only and greater than 10% of chiefs in cardiothoracic surgery (15.8%), thoracic surgery only (11.4%), surgical oncology (17.3%), pediatric surgery (16.1%), transplant surgery (11.3%), plastic/burn surgery (17.7%), vascular surgery (14.3%), and general surgery (13.5%). Division chiefs of less represented races made up 10.3% of colorectal surgeons but less than 10% of chiefs across all other divisions.

Over 90% of all division chiefs were male (n = 713). Twelve colorectal division chiefs (17.6%), five thoracic surgery only chiefs (14.3%), 14 pediatric surgery chiefs (16.1%), and 11 plastic/burn surgery (12.2%) chiefs were women (Table 2). Divisions with the lowest number of women in leadership positions included cardiothoracic surgery (n = 1), cardiac surgery only (n = 2), and vascular surgery (n = 5). There were no significant differences regarding race or gender across divisional leadership by region ($p > 0.05$, data not shown).

Table 2
Analysis of gender across general surgery leadership.

Leadership Position	Male	Female
Education Leadership		
Chair	99 (85.3%)	17 (14.7%)
Vice Chair of Education	34 (77.3%)	10 (22.7%)
Program Director	88 (74.6%)	30 (25.4%)
Associate Program Director	67 (61.5%)	42 (38.5%)
Division Chiefs		
Colorectal Surgery	56 (82.4%)	12 (17.6%)
Cardiothoracic Surgery	55 (98.2%)	1 (1.8%)
Cardiac Only	33 (94.3%)	2 (5.7%)
Thoracic Only	30 (85.7%)	5 (14.3%)
Surgical Oncology	74 (91.4%)	7 (8.6%)
Trauma/Acute Care Surgery	84 (92.3%)	7 (7.7%)
Pediatric Surgery	73 (83.9%)	14 (16.1%)
Transplant Surgery	75 (92.6%)	6 (7.4%)
Plastic/Burn Surgery	79 (87.8%)	11 (12.2%)
Vascular Surgery	86 (94.5%)	5 (5.5%)
General Surgery	68 (91.9%)	6 (8.1%)

Discussion

In this study of national academic general surgery training programs, we analyzed the distribution of race and gender across leadership positions in each department, including education departments and subspecialty divisions within general surgery. The majority of education and divisional leadership consisted of white men, and only the role of associate program director and select surgical subspecialty division chiefs included higher representation of women. Hispanic and Black surgeons were underrepresented in nearly all fields. As the composition of general surgery trainees becomes increasingly diverse with regard to gender and race[1,8], our findings reflect stagnation in general surgery leadership regarding diversity and inclusivity.

General surgery and subspecialty trainees have become more diverse over the past two decades. However, this increase may not be reflected in current surgical faculty or leadership. In 2004, the number of women entering medical school equaled the number of men. This led to an increase in the number of women entering a general surgery residency program.[8] One study looking at the resident physician workforce found that from 1996 to 2004, the

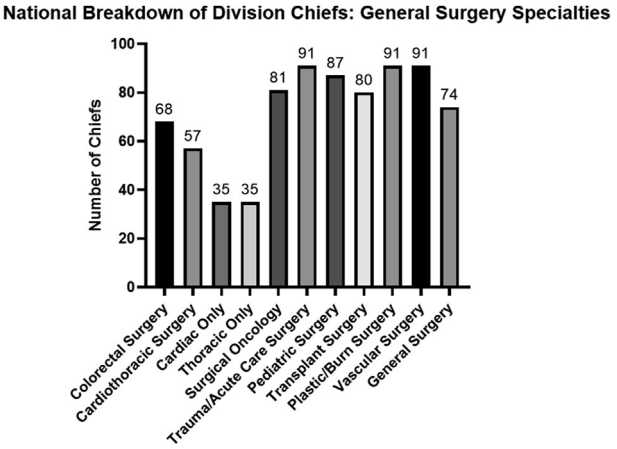

Fig. 2. National breakdown of all divisional chiefs across general surgery subspecialties.

proportion of women increased across seven surgical specialties, and the proportion of black surgeons increased across four.[9] Yet, these increases have not been seen among faculty members. A recent analysis of the past decade of surgical fellowship graduates found that the percentage of Asian graduates has decreased in thoracic, colorectal, and pediatric surgery, the percentage of Hispanic graduates has decreased in thoracic and colorectal surgery, and the percentage of Black graduates has decreased in pediatric and colorectal surgery.[10] Although 4–8% of graduating pediatric surgeons over the past decade are Black, only 3% hold leadership positions within a department. Hispanic surgeons make up 6–8% of colorectal fellowship graduates over the past decade, yet our study found that 0% of colorectal surgery leadership is comprised of Hispanic surgeons. Departments must be cognizant of these disparities and actively recruit underrepresented minorities to academic programs and make advancement for these surgeons a priority.

Regarding gender, from 2000 to 2013, advances were made to improve male to female ratios in all surgical subspecialties except thoracic surgery.[11] Additionally, a 2018 study found that the number of women serving as associate program directors had increased to 29.6%.[4] This was consistent with our study, which found that nearly 40% of associate program directors at academic general surgery programs were women. However, the gap in division leadership between the number of women in specialties and the number serving as division chairs is immense. Women make up 54% of pediatric surgery graduates and 44% of colorectal surgery graduates in the past decade.[10] Yet, our study found that only 16% of pediatric surgery division chiefs and 18% of colorectal surgery division chiefs were women. Although cultural competency and strides to improve diversity in race and gender have been somewhat effective at improving diversity among trainees[12], surgical departments must do better to close the racial and gender gaps in surgical leadership.

Beyond mentorship, diversity has value in academia by moving each field forward.[13,14] Research in business and marketing shows that ethnic diversity broadens consumer markets and stimulates the economy.[15,16] Additionally, ethnic diversity can lead to higher job satisfaction, increased financial performance, and better decision-making. Gender diversity in the workplace has had similar impact. Studies demonstrate that gender diversity in top management positions leads to strategic change, competitive advantage, and innovation.[17,18] Additionally, Fortune 500 companies with women in top management positions have been more financially successful than those without.[19] These findings should be extrapolated to medicine and healthcare. Diversity, whether racial or gender-based, improve our ability to care for patients by incorporating different perspectives and tailoring treatment to each individual patient.[7] Prior studies have also found that Black and Hispanic patients are more likely to seek out and feel comfortable with physicians who are also underrepresented minorities.[20] Additionally, nonwhite physicians care for over 50% of minority patients and over 70% of non-English speaking patients.[21] Black and Hispanic patients are less likely to be insured, and also have a higher unadjusted mortality rate compared to white patients with regards to trauma and emergency general surgery care.[22,23] Disparities have also been found regarding treatment, with physicians prescribing pain medication and opioids to white patients but not Black patients.[24] Data regarding trauma surgeons who completed implicit bias testing showed that despite 80% of surgeons stating they had no racial preferences, 74% had an unconscious bias toward white people based on test results.[25] As the general population becomes more diverse, having multicultural surgical leadership would not only allow better communication and cultural competency[7], but would help decrease bias in care for disadvantaged patients.

Improving diversity among surgical leadership is not only a core mission of the American Surgical Association and many other surgical societies[26], but it is necessary to foster mentorship in the field. Studies across a variety of academic fields have found that students seek mentorship from those who have had similar experiences or come from the same backgrounds.[27] More so, underrepresented minorities benefit from having these mentored relationships from an early age. One study found that near-peer mentorship between high school and medical students promoted health care careers.[28] Another found that underrepresented minority medical students who participated in a mentored research clerkship or clinical rotation had increased interest in otolaryngology with nearly 50% ultimately matching into the field.[29] When general surgery departmental leadership lacks diversity, it may cause students to seek mentorship from physicians in other fields. Surgical interest among underrepresented medical students is minimal at some institutions, and this may be a reflection of the lack of diversity and mentorship that students receive on various rotations.[30] Increasing diversity in leadership positions may help enhance the mentorship women and underrepresented minorities receive and potentially increase interest among students to pursue surgical careers.

Achieving diversity takes contributions from professional societies, surgical departments, and medical schools. However, barriers exist to readily making these improvements, such as lack of opportunities, financial limitations for pursuing medicine, and a shortage of mentors and role models.[31] Promotion in academic medicine can take many years, with the average taking 15–20 years to achieve the rank of professor.[32] Given that diversity in the field only began to increase sharply around 2003, those trainees may not have achieved the rank of professor or have not yet been given leadership positions based on time since graduating. Nonetheless, in 2008, Asians comprised only 4.9% of tenured surgical professors while Black and Hispanic surgeons accounts for only 1.8% and 2.7%, respectively.[33] Despite this data, little progress has been made. In 2015, Black surgeons only accounted for 4% of assistant professors, 3% of associate professors, and 2% of full professors. Hispanic surgeons only represented 5% of assistant and associate professors, and 4% of full professors.[34] Regarding gender, studies have found that women do not advance in academic rank as quickly as men.[32] One solution to improve diversity may be the creation of more positions with a leadership component. Our study showed a trend that more wom.en served as an associate program director at institutions that had more than one faculty member fulfilling this role. These positions may serve as leadership foundation and allow women and minorities the opportunity to advance sooner. Similar findings have been shown in regard to academic advancement among minorities, where a lack of diversity in head positions has led to the lack of opportunity for future faculty members.[35] One study found that underrepresented minorities and Asian faculty members were promoted at lower rates than white faculty members.[36] This could be attributed to a shortage of mentors with leadership positions. One method to remedy this discrepancy would be the creation of pipelines. Mason et al. found that the creation of a summer internship program lead to a greater than 70% match rate into orthopedics and other procedural specialties for women and underrepresented minorities.[37]

While pipelines may create small changes, these alone would not achieve the desperately needed changes to the system. A survey of over 3000 faculty at 24 medical schools found that white faculty were more likely to be tenured or on a tenured track compared to faculty of other racial groups.[38] They also found that white faculty and men were more likely to spend less than 50% of time in clinical duties, whereas Black, Hispanic, and women surgeons were all likely to spend greater than 50% of time in clinical responsibilities.

This led to white faculty conducting more research and having more first-authored and peer-reviewed publications than other groups. Additionally, many underrepresented minorities felt they had to devote more time to serve on committees because of their race rather than spending time on research.[38] While research is valuable to every medical school, clinical responsibility to patients is of the utmost importance, and surgeons should not be overlooked for promotion because they prioritize patient care. Given this data, perhaps medical schools should re-evaluate advancement at major academic medical centers and re-prioritize the value of each surgeon's contributions when considering promotion. These programs and initiatives, in addition to system-wide culture changes and reduction of medical school debt, have been shown to reduce the disparities in promotion among women and underrepresented minority faculty members.

While this study and others before have highlighted the racial and gender gaps in medicine, methods to make progress and create equity are less frequently discussed. Department chairs should first look within their departments to analyze the composition of surgeons and residents they employ. Effort should be made to recruit a diverse workforce by including URM and women physicians to have a role in recruitment. However, unconscious bias exists in recruiting residents and physicians and this should be mitigated. Simply distributing the Implicit Association Test to point out individual and group biases is not enough given that prior studies have shown it does not accurately predict discrimination.[39] Instead, a structured initiative should be undertaken that includes creating a diversity task force, an anti-racism curriculum to help change the overall culture, and persistent re-evaluation of the progress being made.[40] Beyond just a curriculum, departments need to show action by inviting women and URM professors to speak, standardizing pay to create equity among surgeons with similar experience, creating funding to encourage women and URM surgeons to pursue research initiatives, collaborating with the community to ensure understanding of the disparities these communities face, and ultimately creating a space for employees to discuss race and gender disparity in an open-minded setting without fear of repercussions. Empowering women and URM medical students, residents, and physicians is the responsibility of those in leadership positions and is essential to creating an environment of inclusion, equity, and diversity.

Our study has several limitations. First, in addition to professional society databases, this study utilized department websites to evaluate surgeon biographies and photos for racial and gender determinations. This may introduce bias and may not reflect how surgeons self-identify. However, each surgeon was reviewed by two independent evaluators using the same resources utilized by applicants to gauge their perception of diversity at each institution. Future studies may be able to use societal databases that include surgeon self-identification of race and gender that are not currently publicly available or distribute a national survey. Additionally, we were unable to accurately assess some forms of education leadership, such as clerkship directors and assistant clerkship directors, given this information was more difficult to elicit.

Conclusions

In summary, this study analyzed race and gender across education and divisional leadership in academic general surgery programs across the country. While there are efforts to increase the number of women and underrepresented minorities serving in leadership, large gaps remain. Enhancing diversity in leadership positions and creating multicultural teams enriches the field, fostering mentorship and improving patient care. Programs should strive to create a more diverse environment by examining their own faculty and resident composition, actively recruiting women and underrepresented minorities, developing programs for early engagement with underrepresented students, and creating advancement opportunities for women and underrepresented minority faculty.

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