

Diversity in the US Infectious Diseases Workforce: Challenges for Women and Underrepresented Minorities

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Research documents significant gender-based salary inequities among physicians and ongoing inadequacies in recruitment and promotion of physicians from underrepresented minority groups. Given the complexity of the social forces that promote these disparities, their elimination will likely require quantitative and qualitative research to understand the pathways that lead to them and to develop effective solutions. Interventions to combat implicit bias will be required, and structural interventions that hold medical school leadership accountable are needed to achieve and maintain salary equity and racial and gender diversity at all levels.

Keywords. Disparities; gender; race; implicit bias; compensation.

Diversity in the healthcare and scientific research workforce is critical for patient care and scientific research in the 21st century. Recent studies of the infectious diseases (ID) workforce, however, have revealed pervasive and significant disparities in salary compensation for women and deficits in recruitment and retention of underrepresented minorities (URMs). The first step in achieving gender and minority equality is acknowledging that it exists. While numerous publications have addressed these issues in overall employment globally, tremendous gaps remain in medicine, for which the literature is more scant. This review will discuss compensation, promotion, and advancement challenges that are still faced by women and URMs in the ID field.

We begin with a brief review of previous milestones in addressing gender and minority disparities in the healthcare workplace. The Office of Research on Women's Health at the National Institute of Health (NIH) was created in 1990 not only to promote research on sex and gender roles in health but to recruit, retain, and advance women in biomedical careers. Within this office is the NIH Women of Color Research Network, whose aim is to facilitate research careers of women of color. In 1991, the Council of Ethical and Judicial Affairs for the American Medical Association [1] reported on gender disparities in clinical decision making and acknowledged the challenges of designing a study that could control for the myriad social, economic, and cultural factors influencing medical decisions. They called on clinicians to examine their cultural and social biases that could influence their decisions. The council advocated for more

research on women's health and finally called for "an increase in the number of female physicians in leadership roles and other positions of authority in teaching, research and the practice of medicine" [1]. Over the next 2 decades, programs such as loan repayment programs and fellowships were created to increase enrollment of women and minorities in graduate and medical schools. While the Office of Minority Programs was created in the NIH Office of the Director in 1990, it was not until 2000 that the NIH established the National Center on Minority Health and Health Disparities, which became the National Institute on Minority Health and Health Disparities (NIMHD) in 2010. The NIMHD works collaboratively with other institutes to build the infrastructure to attract and retain students from diverse backgrounds and develop research mentoring networks to increase workforce diversity. In 2010, the American College of Physicians published a position paper [2] on racial and ethnic disparities in healthcare. The paper concluded that "a diverse health care workforce that is more representative of the patients it serves is crucial to promote understanding among physicians and other health care professionals and patients, facilitate quality care, and promote equity in the health care system" [2]. The recommendations for achieving this diverse workforce included encouraging medical schools to recruit and retain more URM faculty and promoting URM faculty to leadership positions. But challenges remain in maintaining the necessary workforce in ID and human immunodeficiency virus primary care, for which compensation is less than in other medical specialties and the primary individuals served are often members of vulnerable populations.

FAIR COMPENSATION

In 2015 the Infectious Diseases Society of America (IDSA) [3] surveyed its members to assess the annual compensation of ID physicians. Women composed 29%–44% of those responding in all practice settings, but race and ethnicity were not assessed

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in this report. Among physicians who provided patient care, those in private practices classified as solo/owner/partner had the highest incomes, whereas those in academic practices had the lowest compensation. A table highlighted compensation of physicians providing patient care, stratified by age and gender. Among physicians classified as solo/owner/partner, women aged 50–59 years earned 13% less than men, and among all other ages, women earned 44% less. Among physicians in academic centers, there was no significant gender pay gap until age 40 years, when women's salaries lagged behind those of men by 16%–24%.

Doximity [4, 5] surveyed >36 000 physicians across the United States and found that women are paid significantly less than men, regardless of medical specialty and geography. While they controlled for work hours, physician age, and other potential contributors, they did not examine reasons for this pay gap. Seven of the 10 lowest salaries were in pediatrics, with pediatric ID (median, \$186 000/year) ranking lowest among all medical subspecialties. Adult ID physicians' salary (median, \$247 000/year) was reported as 18th among the 24 subspecialties that have the lowest average compensation. HIV primary care was not included as a unique specialty, as has been done in other surveys. The average national compensation ranged from 19% to 33%, based on location of practice, with a gender pay gap of 26.5%, irrespective of specialty. Non-US-trained physicians earned 2.5% less than US-trained physicians, but differences stratified by race and ethnicity were not reported. Thus, women physicians in every specialty and every region of the United States earn less than male physicians.

The reasons for these gender disparities are unclear. Sheryl Sandberg's 2013 book *Lean in: Women, Work and the Will to Lead* speculates that women face more barriers than men because of conflicting personal and social obligations and that they may not negotiate for salary and amenities as do men [6]. One study, conducted by Jolly et al [7], found similar conclusions in that young, high-achieving female physician-researchers spent more time than their male counterparts on parenting responsibilities.

Jena et al [8] examined sex differences in salaries among 10 241 physician faculty (34.7% female) in 24 US public medical schools. They found that women earned approximately \$51 000 less than men annually. This disparity varied across medicine subspecialties and institutions and by faculty rank, with salaries were lowest in ID, family medicine, and neurology. Even after adjustment for years of experience, specialty, faculty rank, measures of research productivity, and Medicare payments, women's salaries were 8% lower than those of men. Seabury et al [9] used nationally representative Current Population Survey data from 1990–2010 and showed that gaps persisted into the last decade studied, even with similar adjustments, providing strong evidence that the gender pay gap is genuine and cannot be attributed to confounding.

Some studies have also identified racial disparities in salary among physicians. One analysis combined data from 2 national

surveys [10] and examined the difference in incomes of US physicians stratified by race and gender. They found that white male physicians earn a median of \$64 812 more than black male physicians. While there was no statistically significant difference in salaries between white and black female physicians, the gap between white male physicians and black female physicians was the widest, with a reported median gap of \$100 258. As in other studies, significant disparities in physician salaries stratified by race and gender persisted even after adjustment for specialty, hours worked, practice characteristics, insurance mix, and geography.

Finally, although data are limited, there is some evidence that women in all practice settings may begin their careers on a lower rung of the pay ladder. Sege et al [11] reported that start-up funding packages for male faculty were on average 67.5% higher than those for female faculty. This finding underscores the need for young female physicians to learn and use negotiating skills and advocate for compensation equity at the onset of their careers—a potentially daunting task, given the power dynamics that may favor gender imbalance in these settings from the start. In addition, compensation plans should be well defined and transparent, with clear understanding of expectations at the time of hire.

PROMOTION

Female and URM physicians and scientists are less likely to have NIH funding and hold academic leadership positions. Several studies have shown disparities in faculty promotion. An analysis of 50 145 medical school faculty who were assistant or associate professors between 1980 and 1989 revealed that, by 1997, 46% and 50% of white assistant and associate professors, respectively, had been promoted, compared with 30% and 36% of URM assistant and associate professors, respectively. These differences in promotion rates remained even after adjustment for potential confounding factors, such as gender, tenure status, and receipt of NIH awards [12]. Nunez-Smith et al [13] confirmed these findings in a study of 128 academic medical centers and 88 432 faculty. They showed that the promotion rates to associate professor and professor were lower for black faculty than for white faculty in 75% and 79% of institutions, respectively, whereas the promotion rates to associate professor and professor were lower for Hispanic faculty than for white faculty in 74% and 60%, respectively. Although the reasons for this disparity in promotion rates were not identified in these studies, the consequences are clear.

While enrollment of women in medical school has increased over the past decade, matriculation of URM students still lags significantly. As noted by Gibbs and Marsteller of the Office of Program Planning, National Institute of General Medical Sciences (NIGMS) [14], students from URM backgrounds earned only 17% of bachelor's degrees and 8% of PhDs in life sciences, although this population represents 32% of the overall population. These data suggest that the pool of URM applicants for entry into medical school needs to substantially increase. Efforts are needed to attract URM students in life sciences at earlier stages

of their education and to address barriers that may limit their access to higher education in the life sciences, including medicine. The NIGMS [15] has called for a “broadening of participation” in the life sciences and proposes systematic data collection and analysis to establish pathways that will increase training and professional development of women and minorities.

Nivet’s [16] excellent 2010 review of the literature highlighted the importance and need for additional efforts to increase the pipeline of URMs pursuing academic careers. Sadly, despite medical schools’ statements about incorporation of diversity goals in their strategic plans and faculty recruitment and promotion campaigns, the racial diversity of medical school faculties has increased little during the past decade. The Association of American Medical Colleges (AAMC) facts and figures report for 2016 [17] noted that the number of URM applicants has remained constant, with a trend of a decreasing number of black males matriculating in medical school. As of 2015, 39% of full-time faculty are female; however, female faculty from some racial and ethnic minority groups continue to be underrepresented in academic medicine. Only 4% of full-time faculty identify as female and either black or African American, Latino or Hispanic, Native American or Alaska Native, or Native Hawaiian or Pacific Islander. Of note, only 3% of department chairs in academic medicine are women of color [18]. Membership in ID professional societies reflects the AAMC findings (Tables 1 and 2). ID training programs have seen a marked increase in women but not URMs entering the profession. The 2016 data from the ACGME reveal that 52% of our adult ID trainees are female, 7% are African American, and 12% are Latino and that 72% of our pediatric ID trainees are female, 8.6% are African American, and 10.5% are Latino.

DISCUSSION

The evidence clearly demonstrates significant gaps in physician salaries based on gender and race, but none of these studies have elucidated the reasons for these inequities. Implicit race and gender bias, social and professional networks, socialization of women, administrative structures of academic medicine, and business models for medical practice are just a few of the potential contributing factors. Given the complexity of the social forces that promote these disparities, their elimination will likely require quantitative and qualitative research to understand the pathways that lead to these disparities and to develop effective solutions.

Considerable attention has focused on implicit or unconscious bias that may contribute to the magnitude of this problem. Implicit bias refers to the attitudes or stereotypes that affect our understanding, judgment, actions, and decisions without our conscious awareness. Combating the effects of implicit bias will require us to be cognizant of our own behaviors and the behavior of others above all, to become more aware of how decisions are made, and to acknowledge when implicit bias is affecting our behavior in ways that may contribute to ongoing

stereotypes that lead to disparities. In a pair-matched, single-blinded, cluster-randomized controlled study of faculty in 92 departments at the University of Wisconsin, Carnes et al [19] demonstrated that a gender-bias-habit-changing behavioral intervention can reduce gender bias habits. Surveys conducted before and after workshops measured gender bias awareness; motivation, self-efficacy, and outcome expectations to reduce bias; and gender equity action. When >25% of a department participated in a workshop, they found that, 3 months after the intervention, there were significant increases in self-reported actions to promote gender equity. Implementing such an effort on a large scale will pose considerable challenges but will likely confirm that implicit bias plays a substantial role in the disparities affecting compensation and promotion in medicine.

While measures that address unconscious bias and other individual-level interventions are important, structural interventions will also be critical. Studies have shown that interventions such as the introduction of faculty development programs for URMs that emphasize mentoring by senior faculty, peer networking, professional skill development, and institutional culture training increase retention, academic productivity, and promotion of URMs [20], especially when the programs are of

Table 1. Distribution of Self-Reported Race, Overall and by Self-Reported Gender, Among Members of the Infectious Diseases Society of America (IDSA), the Society for Healthcare Epidemiology of America (SHEA), and the Pediatric Infectious Diseases Society (PIDS)

Society, Race	Overall	Male	Female	No Response
IDSA	n = 9871	n = 5554	n = 3567	n = 750
American Indian/Native Alaskan	35 (0)	22 (0)	12 (0)	1 (0)
Asian	1548 (16)	821 (15)	721 (20)	6 (1)
Black/African American	289 (3)	159 (3)	128 (4)	2 (0)
Hispanic/Latino	595 (6)	357 (6)	237 (7)	1 (0)
White/Caucasian	5333 (54)	3420 (62)	1903 (53)	10 (1)
Other	385 (4)	230 (4)	155 (4)	0 (0)
No response	1686 (17)	545 (10)	411 (12)	730 (97)
SHEA	n = 1700	n = 744	n = 762	n = 194
American Indian/Native Alaskan	4 (0)	4 (1)	0 (0)	0 (0)
Asian	133 (8)	64 (9)	68 (9)	1 (1)
Black/African American	17 (1)	9 (1)	8 (1)	0 (0)
Hispanic/Latino	46 (3)	23 (3)	23 (3)	0 (0)
White/Caucasian	618 (36)	378 (51)	240 (31)	0 (0)
Other	33 (2)	22 (3)	11 (1)	0 (0)
No response	849 (50)	24 (33)	412 (54)	193 (99)
PIDS	n = 873	n = 418	n = 394	n = 61
American Indian/Native Alaskan	2 (0)	1 (0)	1 (0)	0 (0)
Asian	82 (9)	32 (8)	50 (13)	0 (0)
Black/African American	16 (2)	5 (1)	11 (3)	0 (0)
Hispanic/Latino	53 (6)	28 (7)	25 (6)	0 (0)
White/Caucasian	449 (51)	252 (60)	196 (50)	1 (2)
Other	21 (2)	10 (2)	11 (3)	0 (0)
No response	250 (29)	90 (22)	100 (25)	60 (98)

Table 2. Distribution of Self-Reported Gender, Overall and by Self-Reported Race, Among Members of the Infectious Diseases Society of America (IDSA), the Society for Healthcare Epidemiology of America (SHEA), and the Pediatric Infectious Diseases Society (PIDS)

Society, Gender	Overall	American Indian/ Native Alaskan	Asian	Black/African American	Hispanic/Latino	White/Caucasian	Other	No Response
IDSA	n = 9871	n = 35	n = 1548	n = 289	n = 595	n = 5333	n = 385	n = 1686
Male	5554 (56)	22 (63)	821 (53)	159 (55)	357 (60)	3420 (64)	230 (60)	545 (32)
Female	3567 (36)	12 (34)	721 (47)	128 (44)	237 (40)	1903 (36)	155 (40)	411 (24)
No response	750 (8)	1 (3)	6 (0)	2 (1)	1 (0)	10 (0)	0 (0)	730 (43)
SHEA	n = 1700	n = 4	n = 133	n = 17	n = 46	n = 618	n = 33	n = 849
Male	744 (44)	4 (100)	64 (48)	9 (53)	23 (50)	378 (61)	22 (67)	244 (29)
Female	762 (45)	0 (0)	68 (51)	8 (47)	23 (5)	240 (39)	11 (33)	412 (49)
No response	194 (11)	0 (0)	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)	193 (23)
PIDS	n = 873	n = 2	n = 82	n = 16	n = 53	n = 449	n = 21	n = 250
Male	418 (48)	1 (50)	32 (39)	5 (31)	28 (53)	252 (56)	10 (48)	90 (36)
Female	394 (45)	1 (50)	50 (61)	11 (69)	25 (47)	196 (44)	11 (52)	100 (40)
No response	61 (7)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0)	0 (0)	60 (24)

longer duration or greater intensity [21]. Medical school leadership should be encouraged to develop these innovative programs. Moreover, leadership should be held accountable for achieving and maintaining salary equity and racial and gender diversity at all levels. Performance evaluations of division chiefs, department chairs, and medical school deans should be based in part on their success in achieving these goals.

The term “cultural taxation” refers to the increased uncompensated institutional service obligations that burden URM faculty because of the lack of minority representation in their institutions [22]. Women faculty, especially senior faculty, experience similar cultural taxation because of the shortage of female full professors. Individuals experiencing cultural taxation may find themselves being overburdened with school and hospital obligations to teach and participate in committees at the expense of their own clinical and research productivity. These service activities should be recognized with appropriate financial compensation for time and effort and should be defined in the metrics for promotion.

Some believe that home and work lifestyle choices made by women compromise patient care and justify lower salaries for women than for men. One large study that generated considerable press attention suggests that this is not true. Elderly patients receiving inpatient care from female internists had lower 30-day mortality and readmission rates, compared with patients cared for by male internists. The authors noted that, in the primary care setting, compared with male physicians, female physicians are more likely to practice evidence-based medicine and provide patient-centered care and that they do as well or better on standardized examinations [23]. Clearly, we need to dispel perceptions that are unsupported by reality and that promote gender-related disparities in salary.

As a first step in addressing pay inequities, the IDSA established the Gender Disparity Task Force in September 2016, whose charge is (1) to identify contributors to gender disparities within the ID field and among ID specialties and (2) to

make recommendations to address gender disparities within ID. This task force comprises a diverse group of physicians representing the IDSA, which is expected to release the task force’s recommendations during IDWeek 2017. Increasing female physicians’ compensation, irrespective of race and ethnicity, to equal that of their male peers—in all subspecialties and certainly in ID—could not be more appropriate, just, or timely. A task force to address minority disparities in the ID field is urgently needed. The role of medical school debt and lower salaries of ID physicians is unclear. Graduating internal medicine residents [24] were asked whether they were the primary wage earners for their families, as a surrogate for increased need for income. Being a primary wage earner was not associated with pursuit of an ID career, consideration with ultimate rejection of a career in ID, or failure to ever consider an ID subspecialty. Further studies using a national database or registry to collect information on debt, compensation, and career choices would enhance our ability to address disparities. We recommend that the IDSA establish a diversity and inclusion committee to generate the data necessary for developing a strategic plan to improve the diversity of our workforce and eliminate disparities. Finally, we call on all ID practitioners to lead the pursuit of equity not only in our own field, but also in the field of medicine overall.

Notes

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