

Women and Minorities in Research Careers

Abstract

Although women comprise 51% of the US population, and African Americans, Native Americans, and Hispanics combined make up nearly 30% of the population, they are vastly underrepresented in the sciences and face special challenges when trying to advance in academic research careers. Reasons include sexist/ethnic bias; lack of mentors and peers from similar backgrounds, which can create a sense of isolation; family responsibilities; and financial constraints, which can keep otherwise motivated researchers out of the field. Solutions to problems of retention and advancement are imperative for retaining researchers lest they look to industry careers instead or abandon research altogether. As part of that effort, the National Academies and the National Institutes of Health have taken measures to identify potential pitfalls and increase the odds of success for women and minorities in academic research careers.

Women

Statistics show women moving toward science careers in the same numbers as men, but the proportion of women drops in the higher ranks. In 2007, women held 33% of faculty positions in US medical schools, but nearly 70% of these are concentrated at the lowest academic ranks (assistant professor, instructor, or other; Figure 1).¹ Women instructors in US medical schools comprise about half all instructors, but the proportion of women drops to a mere 4% of full professors.¹

And while women postdocs receive around half of career development awards and fellowships, women made up less than one-quarter of principal investigators on R01s and equivalent research training grants in 2005.² However, when competing for new R01s, women's success rates were equal to men's, reinforcing the trend that women begin their careers strongly but face barriers further along.² Women faculty have not only more obstacles to academic careers but have less support, including research funding, from their institutions. They also publish less and report less career satisfaction.³

In 2007, the NIH Working Group on Women in Biomedical Careers made recommendations to research to "support the full participation of women and do not reinforce a

culture that fundamentally discriminates against women."² Subcommittee recommendations focused on financial support for mentoring, extending parental leave, child care, and enforcing anti-discrimination laws like Title IX.

In 2007, the National Academies' Committee on Women In Science and Engineering (CWSE) added medicine (to become CWSEM) to its mandate to increase the ranks of women in healthcare and biomedical careers. That mandate includes acting as an information resource; collecting and analyzing data on women in science, engineering, and medicine; reviewing agency, university, and industry policies with regards to the roles of women at those institutions; issuing consensus reports and recommendations; and acting as a central body to support related activities among other organizations within the Academies.⁴

Underrepresented minority groups

While the proportion of underrepresented minorities that is assistant professors has risen in the past two decades, faculty members from underrepresented minority groups are still being promoted to associate or full professor at lower rates than white faculty members.⁵ Minority faculty are also less likely to achieve senior academic rank.⁶ Underrepresented minorities (URMs) make up only 7.2% of

medical school faculty members.⁷ Shavers et al conducted a study to identify barriers for minority investigators and found that only 5.5% of principal investigators who received NIH training grants were from underrepresented minority groups (URMs).⁸ This group also received only 3.2% of NIH research program grants and 10.7% of NIH fellowships. Attracting URMs to biomedical research is important, in part, because minority scientists often have research interests in areas that disproportionately affect minority populations.^{7,9}

Another segment of science lacking minority participation is clinical trials. Increasing the numbers of minority scientists may increase participation of minorities in clinical trials that are led by URM investigators by increasing trust in the medical community.¹⁰

Bias

Bias, although often unintentional, has a negative impact on the success of underrepresented groups. In 1995, a Swedish study by Wenneras and Wold examined why the success rate for female applicants for postdoctoral fellowships from the Swedish Medical Research Council (MRC) was less than half that of male applicants. Women applicants seemed to have to prove themselves more vigorously than men did. Only those women who were more than twice as productive in terms of authored publications received competency scores equal to the average male applicant.¹¹ Women faculty members sense the gender bias. In a questionnaire of medical school faculty members in the United States, Carr et al found that women faculty members were also 2.5 times more likely to report perceptions of gender bias in their schools, and were nearly 7 times more likely to report personal experience with gender bias that hindered their career advancement.¹²

A 2003 study of letters of recommendation written in the mid 1990s for successful applicants to a large US medical school reveal subconsciously biased language. Letters of recommendations for men were 16% longer than letters for female applicants, and women's letters contained more than 5 times as many references to the personal life of the applicant. Letters for female applicants also contained more "doubt raisers" (ambiguous language, faint praise, and negative language) and less high-status terms: women were more likely to be referred to as trainees and teachers than as researchers and professionals.¹³

Race and ethnic bias is equally pervasive. URM faculty

members who report perceived racial or ethnic bias (60% of respondents) also report less career satisfaction, and nearly half of URM report personally experiencing discrimination by a peer or superior.¹⁴ In a qualitative study of non-tenured physicians at the Johns Hopkins School of Medicine, both majority and minority respondents expressed concern that bias affects promotion; both for better and for worse. Price et al conducted interviews and held focus groups to identify barriers to success at culturally diverse institutions. Men and women from URM groups expressed feelings of professional and social isolation, low expectations of their success from majority faculty members, and increased pressure to "represent" their race. Compounding the insidious nature of the bias was some belief among majority faculty members that URMs were at an advantage when promotion was being considered.¹⁵ Rates of promotion surveys by Fang et al and Palepu et al contradict this perception.^{5,6}

Lack of mentorship

Because of their under-representation in research careers, women and minority scientists are likely to have fewer mentors representing their own personal background all along the pipeline, especially at the highest ranks where disparities are most striking. In a study of fourth year medical students, both women and URMs cited lack of mentorship as a barrier to career advancement more often than did their white, male peers.¹⁵ In an NIH-funded study of minority investigators, participants ranked inadequate mentoring as a greater barrier to gaining NIH funding than lack of institutional support, institutional bias, or cultural barriers.⁸

A mentoring model was developed in 2002 and implemented at the College of Medicine at the University of Arkansas with 22 URM mentees. This Peer-Onsite-Distance model aims to increase retention of URM faculty by introducing multiple mentors: higher ranking onsite mentors, distance mentors with leadership roles in similar or dissimilar careers, and mentorship from their own peers. Satisfaction surveys have not yet been conducted but the program has been considered successful enough to warrant transition of the program from a limited grant-funded activity to a permanent activity supported by the College of Medicine.¹⁶

One extremely successful female support group has been the Society for Women in Academic Psychiatry (SWAP), founded in 2005. SWAP is a peer mentoring group that supports female junior faculty members at the University of California, Davis. The group meets every oth-

er month to mentor, educate, and liaison with other women's peer groups. After one year, participants reported a greater sense of connection to one another and to the department and feelings of empowerment due to the closer relationships they established with department leaders.¹⁷

<http://www.ucdmc.ucdavis.edu/psychiatry/aboutus/swap/index.html>

Family Responsibilities

Married women who have had children are a rare breed in top faculty positions. Women who have earned tenure are far more likely than men to be single without children 12 years after earning their PhD.¹⁸ Women in general make up only 14% of tenured faculty members nationally.¹⁹

Increasingly, both women and men are looking for ways to devote time to family without feeling as though they have to sacrifice their careers. Some are taking advantage of trends toward part-time tenure and extending the maximum number of years to tenure review. However, even when institutions allow for the tenure clock to be put on hold so faculty members can meet family demands, women who take advantage of a tenure hold may ultimately be viewed more critically.²⁰ Many institutions now offer dependent care programs that range from vouchers for daily child care to funds to cover travel and day care expenses for researchers who must travel for work. Unfortunately, these services are mainly for full-time faculty members, not post-docs or graduate students.

Cost

Because many URM students come from financially disadvantaged backgrounds, high tuitions can keep them out of medical school and research careers. A 2004 AAMC survey found that cost was the top reason given for not entering medical school among qualified minority students.²¹ Many students (URMs as well as non-URMs) who do complete medical school choose industry careers over the struggle to move through the academic ranks while keeping funded.²²

One resource researchers from disadvantaged backgrounds can take advantage of is the NIH Loan Repayment Program (LRP), which will pay back a substantial portion of one's educational debt in return for a 2-year clinical research commitment. Basic researchers can benefit from LRP if their research focuses on health disparities in underserved populations with significantly increased rates of disease compared to the general population.²³

MedEdMentoring.org

Developed with the support of the National Institute of Mental Health (under contract HHSN278200444084C), the MedEdMentoring.org Web site offers valuable career development tools for junior, mid-level, and senior investigators, including funding announcements, presentations from established researchers, and interactive learning modules. In an effort to encourage diversity in research, MedEdMentoring's advisory board of leading academic researchers in the field of geriatric mental health have presented on the following topics:

Balancing Work/Family Responsibilities

<http://mededmentoring.org/firsttuesday/may2008/index.asp>
Hochang Benjamin Lee, MD

Importance of Support Networks for Women Researchers

<http://mededmentoring.org/firsttuesday/april2008/index.asp>
Jennifer Q. Morse, PhD

Programs for Minority Training

<http://mededmentoring.org/firsttuesday/march2008/index.asp>
Warachal E. Faison, MD

Challenges Faced by Women and Minorities in Job Placement and Promotion in Academic Settings: Is Diversity in Mentoring the Key?

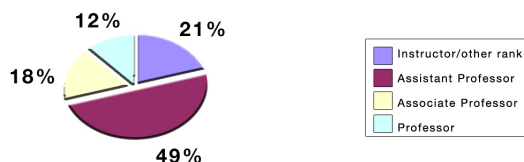
<http://mededmentoring.org/firsttuesday/may2006/index.asp>
Maureen Halpain, MS and Jovier Evans, PhD

Conclusion

Finding solutions to these barriers is essential for the career success of women and minorities who are already in research and for future generations who choose science careers. Family-friendly policies such as longer times to tenure, on-site day care and grant-funded child care, and support groups will ultimately accommodate more talented male and female scientists who would otherwise drop out. The US Census predicts that by 2050, African Americans, Asians, Native Americans, and Hispanics combined will comprise 50% of the US population.²⁴ URM researchers are more likely to investigate health disparities that impact these minority groups thus proving a vital resource for moving our understanding of biomedical science to the next level. Increasing the numbers of women and underrepre-

sented minority investigators will not only empower current researchers to remain, it will also inspire others to follow.

Figure 1. Breakdown of women in US medical schools¹



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